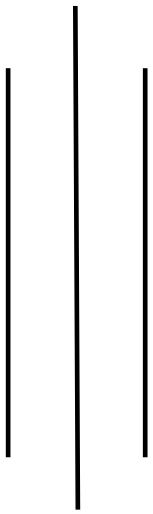
Integrity Mapping in Irrigation Projects



Final Report

Jalsrot Vikas Sanstha (JVS)/GWP Nepal

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CHAPTER 1: BACKGROUND

1.1 IRRIGATION DEVELOPMENT IN NEPAL

Water resource is the main natural resources of Nepal. The resources of water remains in glaciers, snow, rivers, lakes, ponds, wet lands and ground water. There are over 6000 rivers with an estimated length of 45000 Kilometers. Out of a total precipitation of 1700 mm, average annual rainfall in Nepal is estimated to be 1530 mm. 80% of which occurs in the monsoon season from June to September. The total annual average run-off from Nepal to India through these rivers is 224 BCM. Majority of rivers originate inside Nepal and flows to India. But, big rivers Koshi, Gandak (Narayani), Karnali and Mahakali originates from China and flow to India through Nepal. Out of 224 BCM, 50 BCM flows from Terai region and the rest originates from Himal and Chure-Bhawar area. 80 percent of the flow takes place during four months of the monsoon.

In addition to surface water, a large volume of water is available in the shallow and deep aquifers. From quantity and quality perspective, underground water reserves available in the Terai Plains and the inner Terai valleys area are very important water resources. The reserve is estimated to be 14 BCM and of which 8 to 12 BCM is rechargeable annually. Underground water reserve creates potential for use in irrigation and domestic water supplies.

Of the total available annual water, only 15 billion cubic meter or 6.7% is used for various end uses. The use of water in the domestic, industrial and agricultural sector is 3.43, 0.27 and 96.3% respectively.

The country has utilized mainly medium and small rivers for different uses such as drinking water, watermill, irrigation and hydropower. The larger and perennial Himalayan rivers, except for a few cases, has remained untapped for Irrigation and other purposes.

Food production in the country is barely sufficient to meet its annual food requirement. Irrigation is an important input for increasing food production. As of 2011, Nepal has a cultivated area of 2,642,000 ha (18% of its land area), of which two third (1,766,000 ha) is potentially irrigable. Upto the end of F/Y 2011/12, about 71% of the cultivated area has some form of irrigation infrastructure but only 40% of the cultivated area has year round and dependable irrigation. Out of the total land area of 14,718,100 ha, only 2,641,000 hectares (18 percent) is arable, out of which only 1.76 million ha can be provided with irrigation facilities. At present, irrigation infrastructures have been developed to serve 1.331 million ha with irrigation. Of that area, about 972,000 ha of land is irrigated with surface water and about 359,000 ha has groundwater as a source

of water. Only 30 percent of surface water irrigated land has year-round irrigation facilities. The issues in this sector include; inadequate resources for the development of irrigation facilities, poor operation and maintenance of infrastructures, meager collection of Irrigation service fee, lack of appropriate irrigation technology for the commercialized agriculture, poor supply of electricity for the operation of pumps for the ground water irrigation and strengthening of institutional capacity.

Planned irrigation development started in mid-Terai region and Kathmandu valley since late 1950s. The U. S. Aid was the first foreign donor in this sub-sector. Indian aid followed almost simultaneously. The principal donors are, however, the Asian Development Bank (ADB) and the World Bank (WB) which started the assistance in this sector since 1970s. Both the Banks have also helped in developing small irrigation schemes under Integrated Rural Development Projects. Other international agencies, like IFAD, and ILO, have also helped in the development of small irrigation projects. Bilateral agencies like Saudi Fund for Development, and Kuwaiti Fund have also been helping in this sector. The Agricultural Development Bank (ADB/N) has also been assisting the farmers in developing small irrigation schemes.

Four main agencies responsible for the development of irrigation in Nepal are; Department of Irrigation(DoIrr), Department of Local Infrastructures Development and Agriculture Roads, (DoLIDAR), Agriculture Development Bank (ADB/N), and farmers themselves including their formal and informal organizations. Some INGOs, NGOs are also involved in the development of small/micro irrigation in different areas of the country. Besides these agencies, local bodies have also developed some minor irrigation systems, and the role of the local bodies is increasing with GON's emphasis on decentralization. Local Self-Governance Act-2055, Irrigation Policy-2060 and the newly approved Irrigation Policy-2070 have provisions of involving local bodies in the development of small irrigation systems. Accordingly, DoLIDAR has been given responsibility in developing small irrigation systems (CCA<10ha in hills and CCA<100 ha in Terai). DoIrr is involved in the development of irrigation systems having CCA>10ha in the Hills and CCA>100 ha in the Terai. DoIrr is also involved in the development of ground water irrigation systems and non-conventional Irrigation Systems (sprinkler, drip, pond irrigation, rain-water harvesting, treadle pumps etc.) which provide irrigation facilities in the marginal command areas.

There is disparity not only in the occurrence of potential irrigable land area, but also in the distribution of irrigation development among the five development regions and among the three physiographic regions in the country. Of the available potential irrigable area in each region, Terai has developed its 76.3% of its irrigable land, whereas only 51.3% is developed in the mid-hills. In the mountains, 84.1% of the potential irrigable area has been developed.

The monsoon irrigation development requirement is on 510,966 ha land area, but its largest share lies in the Terai (62%), followed by the Hills (35%); and the least requirement in the mountains (3%). But with respect to the available irrigable land within each physiographic region, nearly half of the potential irrigable land (48.7%) in the Hills region is yet to be developed, while only 23.7% of the potential irrigable land remains to be developed in the Terai.

The statistics of irrigation development before the first periodic plan is sketchy. A record shows that a total of 6,228 ha was irrigated during the first periodic plan (1956-1960). It seems that this figure has not included the area irrigated by a large number of FMISs. By the end of the Eleventh Plan (2007/2008-2009/2010), total irrigated area in Nepal was estimated at 1,252,476 ha. At the end of the F/Y 2068/69 (2011/12), a total of 1,311,960 ha of agricultural lands received irrigation water in Nepal. Table1 below shows the status of irrigated area developed in various periodic plans. Of the surface water irrigated area, nearly 69.5% of the area is under farmer-managed systems. Irrigation infrastructures have been developed for nearly 74% of the total potential irrigable agricultural area till the end of FY 2011/12.

Table1: Status of the Irrigated Area (ha) by Periodic Plans

Plan	With the Initiative of Government Agencies					Farmer managed irrigation systems	Additional Irrigated Area	Total Irrigated Area by the end of Plan
	Surface Irrigation	Rehabilitation and expansion of FMIS	Total	Groundwater Irrigation	Total			
First Five-year Plan (1956/57-1960/1961)			6,228		6,228		6,228	6,228
First Five-year Plan (1956/57-1960/1961) to Seventh Five-year Plan (1985/86- 1989/90) and End of Intermediate Period (1990/91-1991/92)			352,076	109,098	461,174	381,814	842,988	849,216
Eight Five-year Plan (1992/93-1996/97)			146,178	60,223	206,401		206,401	1,055,617
Ninth Five-year Plan (1997/98-2001/02)	29,586	80,879	110,465	36,238	146,703	300,935	65,824	1,121,441
Tenth Five-year Plan (2002/03-2006/07)	25,504	14,298	39,802	47,683	87,485	286,637	73,187	1,194,628
Three-year Interim Plan (2007/08-2009/10)	11,394	12,434	23,828	46,454	70,282	274,203	57,848	1,252,476
Three-year Plan (2010/2011-2012/2013)	10,005	15,230	25,235	22,560	47,795	250,144	32,565	1,311,960

Source: Planning, Design, Monitoring and Evaluation Division, Department of Irrigation

In mountains, about 84 % of the potential area has already been irrigated while only 51% of the areas in hills receive irrigation water. Although Terai comprises 75.7% of the potential irrigable agricultural area and 81% of the total irrigated area of the country, only 76.3 of the potential irrigated agriculture area is irrigated and rest 23.7% still depends upon rains.

The remaining irrigable land which is still rain-fed is 510,966 ha. Out of this area 112,904 ha (22.10%) lies in the eastern development region, 145,498 ha (28.48%) in

the central development region, 117,074 ha (22.91%) in the western development region, 89,396 ha (17.50%) in the Mid-Western Development Region and 46,095 ha (9.02%) in the Far-western Development Region. These figures indicate that more irrigation facilities are to be developed in the central development region and less in the far-western development region. Similarly, out of the remaining area to be irrigated 62% lies in the Terai, 35% in the Hills and 3% in the Mountains.

Out of the total 510,967 ha of remaining irrigable area, 223,261 ha can be irrigated through the ground water irrigation in the Terai. The total potential of the groundwater irrigation is 569,976 ha. The highest share of this ground water irrigation potential 518,952 ha (about 90%) can be irrigated through shallow tube-wells and the remaining 51,024 ha (10%) through deep tube wells. The total scope of ground water development in the five Terai districts of eastern region is 178,548 ha of which 115,668 ha is already developed till the end of FY2011/12. In some of the districts, the existing command area of groundwater irrigation exceeds the scope of ground water irrigation.

After establishment of Non-Conventional Irrigation Technology Project (NITP) in 2003 under the DoIrr, the project provides irrigation facility both to under irrigated areas as well as areas designated as non-irrigable due to various reasons ranging from high development cost to non-availability of sufficient quantity of water for conventional irrigation schemes. The Department of Agriculture (DOA) initiated the Small Irrigation Special Program (SISP) in 2000, which aims to support pond irrigation, mechanical and manual water lifting devices - diesel/electric pump sets and treadle pumps. Since 2004/05 the department also introduced the Cooperative Irrigation Program, a somewhat larger program than SISP. In 2006, it was estimated that approximately 45,000 hectare of land has been already been brought under irrigation through the use of non-conventional irrigation technologies benefiting over 171,000 households. By mid-2011, the NITP had supported development of around 177 schemes with a command area of 3,100 ha. On the other hand NGOs' like IDE with its partner organizations had promoted over 211,000 micro-irrigation systems, over 75% of which were treadle pumps, followed by drip systems.

Historic Perspective of Surface Water Irrigation

Planned irrigation development started in mid-Terai region and Kathmandu valley since late 1950s. The U. S. Aid was the first foreign donor in this sub-sector. Indian aid followed almost simultaneously. The principal donors are, however, the Asian Development Bank (ADB) and the World Bank (WB) which started the assistance in this sector since 1970s. The ADB/M has so far extended 9 credits totaling $ 160 million and the WB 13 credits totaling $ 355 million. Both the Banks have also helped in developing small irrigation schemes under Integrated Rural Development Projects. Other

international agencies, like IFAD, and ILO, have also helped in the development of small irrigation projects. Bilateral agencies like Saudi Fund for Development, and Kuwaiti Fund have also been helping in this sector. Quite a few bilateral donors have also been providing assistance in this field under rural development. It may be noted that the Agricultural Development Bank, Nepal (ADB/N) has also been assisting the farmers in developing small irrigation schemes.

In the 1990s, a major shift in the public irrigation development occurred. The innovative project in this context is the Irrigation Management Project (IMP) undertaken with the USAID assistance in 1986/87. It was a pilot project aimed at improving the efficiency of the existing irrigation system. Association of the farmer beneficiaries in the management of the agency managed irrigation system was the principal thrust of this project. It was tried in two projects, Sirsia-Dudhaura and Handetar projects. Water Users Associations (WUA) were formed and associated in the management of these projects.

After the experimentation of this new management approach, the IMP was adopted by the Irrigation Management Transfer Project (IMPT) in 1991/92 with the assistance of the ADB for the hardware part and that of the USAID for the software. Under this project, eleven of the existing Agency Managed Irrigation Systems (AMIS) were to be transferred to the respective farmers for management; three projects, namely, West Gandak, Pancha Kanya and Khageri irrigation systems under the first phase and the rest eight irrigation systems within 4 years of the second phase.

With adequate preparatory work, rehabilitation of the irrigation systems, formation of WUAs, training of the concerned functionaries, preparation of the guidelines etc, West Gandak and Pancha Kanya projects were wholly transferred to respective WUAs and the third one, Khageri project was partially transferred with the head works and main canal being retained with DoIrr and the other canals and distributaries handed over to the WUAs. The project is completed in 2004.Another important change in irrigation development which came about during the late 1980s is the shift towards a program approach in the ADB and WB assisted projects. It was the beginning of a shift from new projects to assistance, improvement and rehabilitation of the farmer managed surface irrigation schemes (FMIS). ADB assisted Irrigation Sector Project (ISP) was launched in 1989 with the objective of improving irrigation facilities covering 25,000 ha in the Central and Eastern regions, of which about 17,000 ha are in the Terai and 8000 ha in the hills. UNDP provided technical assistance for this project. Contribution from the government and beneficiary farmers was 10 percent each. Of the 10 percent contribution, the farmers were required to provide 2 percent in cash and the rest in labor. The institutional component of this project under UNDP assistance was to cater to the strengthening of the capability of DoIrr and institutionalizing the Farmer's Participatory Approach in DoIrr. This was to be achieved through training, workshops, seminars and study tours for DoIrr engineers, technical staff and key farmers. The selection of sub-projects was entrusted to Mobile Irrigation Team (MIT) consisting of irrigation engineers,

senior farmers from Farmers' Association, agronomist, agricultural economist etc, on the basis of the concerned farmers' request.

Stressing the need for a shift to "quick-yielding, high-return investments" and "farmer-managed operations", the World Bank also adopted a similar approach in the Irrigation Line of Credit (ILC) project which constituted a part of Mahakali Irrigation Project Stage II and the Bhairahwa-Lumbini Groundwater Irrigation III Project in 1990. It was a pilot project with the objective "to expand farmer-managed irrigation, promote farmer participation and local initiative and help develop DOIrr's capacity to implement a sector program based on farmer participation in preparation for future sector lending". ILC was to cover Western, Mid-Western and Far-Western regions. It may be noted that the Eastern and Central regions were covered by the ISP.

The success of these projects led both the government and the donors to undertake such projects on a bigger scale. The ISP was immediately adopted by Second Irrigation Sector Project (SISP) with ADB assistance. Likewise, Nepal Irrigation Sector Project (NISP) came up with WB assistance "based on the successful pilot experience in the Irrigation Line of Credit". After the successful completion of SISP it was followed by the Community Managed Irrigated Agriculture Project (CMAISP) with the financial aid of the ADB. Similarly, NISP was followed by World Bank financed Irrigation and Water Resources Management Project (IWRMP).

It is worth noting that the East Rapti Irrigation Project (ERIP) (approved by the ADB in Nov 1987) designed to divert the flow of the Rapti river was conceptually reformulated to improve the existing farmer-managed small schemes on the line of SISP. It was implemented in 1993/94 and successfully completed in 1998.

Over the last two decade, irrigation development has undergone a radical orientation, from supply-driven approach to demand-driven,, from farmer management to agency management. Rehabilitation and extension of existing irrigation schemes substituted construction of new projects and enhanced agriculture production of existing irrigated area in partnership with WUAs, DoIrr and DoA.

After the approval of Irrigation Policy-2060, development of small irrigation (CCA<25 ha in the hills and CCA<200ha in the Terai) was transferred to DoLIDAR. The newly approved Irrigation Policy-2070 has given continuity to this provision however recent amendment in Irrigation Policy-2070 has changed the capacity of small irrigation from 25 ha to 10 ha in the hills and 200 ha to 100 ha in the Terai. With this provision in place DoIrr will be involved in the development of medium to large irrigation systems, groundwater irrigation and non-conventional irrigation systems.

DoIrr has started the construction of Sikta Irrigation Project (34,000ha) in the Banke district with its own financing. Construction of headwork in the Rapti River and 15 km main canal is completed. Similarly, DoIrr has implemented the most ambitious Bheri-

Babai Multipurpose Water Transfer Project aiming to divert the water from water-surplus Bheri river into the water-deficit Babai river. The use of modern technology viz. the tunnel boring machine(TBM) is planned to be mobilized for the construction of its tunnel which could be taken as a milestone on the use of modern technology in the construction of irrigation infrastructures in Nepal. The success of Bheri-babai project will open an avenue for the construction of other inter-basin water transfer projects viz. Sunkoshi Kamala, Kaligandaki-Tinau, Sunkoshi- Marin and other such projects. Both the projects are enlisted as 'Projects of National Pride' and have received sufficient attention from the GoN.

Historic Perspective of Ground Water Irrigation

Ground water irrigation development comprises two distinct elements - one is the public sector sponsored tube-well projects and the other private shallow tube-well (STW) development partly on the farmer's own initiative and finance, and mostly with the support and credit from Agricultural Development Bank, Nepal (ADB/N). The government sector ground water development started with the conversion of investigation bores into production wells under the groundwater exploration project undertaken with USAID assistance (1969-74) in the 1970s. Project oriented tube-well development started in 1978 with the Bhairahwa-Lumbini Ground Water Irrigation Project (BLGWIP) with World Bank assistance. It was a deep tube-well (DTW) project, which also provided for electrification and rural roads. It was followed by two subsequent projects. The third BLGWIP has just completed.

DTW development was also carried out under Narayani Zone Irrigation Development Project (NZIDP), Ground Resources Development Project, Janakpur Agricultural Development Project (JADP) and Sagarmatha Integrated Development Project (SIRDP). The first two projects were implemented by DoIrr, JADP by Department of Agriculture (DoA), and SIRDP by the Ministry of Local Development.

Private sector groundwater development has been promoted by ADB/N since 1980. It comprises STW development, essentially on an individual basis, with about 5% group owners. With the support of ADB and IFAD, it expanded its activities all over the country, and installed about 46,700 STWS until 1998/99. "At least two-thirds of the total groundwater irrigated area is supplied by privately installed ADB/N type STWs". With more than 4,500 STW installations in 1992/93, the performance of ADB/N came down significantly to 1366 STW in 1998/99. With the revision in the subsidy policy of the government that limited this incentive to group ownership only, the STW program of ADB/N which was primarily individual-oriented was seriously handicapped. ADB/N is now waiting for the decision to reorient its program.

With better knowledge acquired through exploration of the shallow aquifers with UNDP assistance (1976-1980), the WB has also started providing assistance to STW development under ILC project since 1990. Encouraged by clustered type shallow tube-wells of 10 ha/well, STW development was continued under NISP in Mid-Western Region.

Another ongoing important project under groundwater irrigation is community STW Irrigation Project that started in 1995 with the assistance of IFAD. It is cluster type STW to be handed over to farmer groups. It was implemented by Groundwater Resources Development Project (GWRDP).

With the emphasis placed on STWs for irrigated agriculture under the Agriculture Perspective Plan (APP), GoN started a comprehensive project, Community Groundwater Irrigation Sector Project (CGISP) with ADB assistance in 1998. This project has basically adopted group STW irrigation approach more or less on the line of NISP's cluster type STWs. But in CGISP, the role of DoIrr is limited to that of a facilitator and NGOs are mobilized to form WUAs who implement STW. DoIrr provides technical support and training to WUAs and drillers. In NISP, DoIrr is the implementer of STW in cluster on community basis. CGISP covers 12 Terai Districts of Central and Eastern Development Regions.

APP had envisaged irrigating 22,000 ha of command area through the development of 8,800 number of shallow tube-wells and 2,000 ha through the development of 50 deep tube-wells. Accordingly, the deep and shallow tube-well project is under implementation from 1997 and will be completed in 2017. Total cost of the project is NRs15.5 billion which is financed by the GoN.

The Government of India is also supporting the development of groundwater irrigation in the Terai districts of Nepal. This program is under implementation from 2004 with the aid of the Government of India. The main objective of this project is to provide year-round irrigation to 880 ha of command area by developing 22 numbers of deep tube-wells in Jhapa, Sunsari, Saptari and Siraha districts of the eastern development region. Similarly, the development of 1000 shallow tube-wells in Dhanusha and Mahottari districts, and 350 shallow tube-wells in Siraha district is also envisaged in this program. Total cost of the project is NRs 426.3 million which is shared by the GON and GOI.

Future Inter-basin water transfer projects

Till date, the irrigation projects, small and large, are of the run-of the river type. As less than 50% of the irrigated areas have year-round irrigation, the need of flow regulating storage project or inter-basin transfer has been realized. Irrigation Master Plan,1990 had identified a number of potential multipurpose projects such as: Kanaki Multipurpose

Project for Jhapa (38,000 ha), Kamala Multipurpose Project for Siraha/Mahottari (33,000 ha), Sun Koshi Kamala Diversion Project for Saptari/Sarlahi (1,38,0000 ha), Bagmati Multipurpose Project for Dhanusha/Bara (76,000 ha), West Rapti Multipurpose Project for Kapilvastu/Banke (76,100 ha), Karnali Multipurpose Project for Banke/Kailali (1,91,000 ha) and Bheri-Babai Diversion Project for Bardiya (53,500 ha).

The National Water Plan, 2002 suggested that the inter-basin transfer projects and storage reservoirs be implemented to increase the year-round irrigation area. It also emphasized on the implementation of multipurpose projects which would bring additional benefits by producing hydropower energy. Irrigation Policy, 2003 (BS 2060) has suggested inter-basin transfer implicitly as a basis for improving dry season supplies if the transferring basin has surplus water supply. In this context, the DoIrr is presently studying seven inter-basin water diversion projects, namely, Bheri-Babai, Kaligandaki-Tinau, Kaligandaki-Nawalparasi, Trishuli-Chitwan, Madi-Dang, Sunkoshi-Marin and Sunkoshi-Kamala diversion projects. The preliminary study shows that these projects can irrigate 516,100 ha land and produce 463 MW hydro-power.

1.2 NEED OF INTEGRITY MAPPING

Integrity in water resources development is defined as the adherence of stakeholders and institutions to governance principles of transparency, accountability, and participation in water resource management, based on core values of honesty, equity and professionalism. Ultimately, water integrity is one of the most important means to achieve a water wise world, one that is resistant to corruption.

Water is essential to all facets of life, but the world has started facing increasing water scarcity, conflicts over shared water resources, droughts and other water induced disasters mainly in some of the most densely populated areas and the poverty stricken area of the world. There is an ever increasing demand for water and the number and types of crisis and challenges are increasing. Often, water shortage is not due to shortage of water resources but due to governance failures, such as institutional fragmentation, lack of coordinated decision-making, corruption and poor practices of transparency and accountability. The term "water integrity" is the integrity of people and institutions governing water resources, decision making that is fair and inclusive, honest and transparent, accountable and free of corruption. The term also embraces that management decisions have an ethical dimension, and that leadership needs courage as well as technical skills.

Governance systems are rarely able to prevent corruption and, at times, even put closed eye towards unethical behavior and poor professional practice. Integrity issues lead to conflicts around water at local, national, and international levels. Population increase, globalization, urbanization and new insights into the long-term consequences

of environmental changes question traditional approaches to water management and aggravate the impacts of corruption. Improving water governance requires improving water integrity in which strengthening the aspects of transparency, accountability, and participation (TAP) is specifically crucial. Massive investments and aid flowing into the water sector makes it highly vulnerable to corruption. Stakeholders need to come together and bring water integrity principles into practice. It requires evidence based knowledge, strong alliances, good tools and institutional changes to enhance integrity. To extend the base and increase the pace to tackle corruption and promote integrity through cooperative approaches it is necessary to bring the knowledge and experience of different water sector stakeholders to fight corruption, and to build alliances to address the integrity challenge.

The term integrity, derived from the Latin word for ‘whole’, implies wholeness and consistency from a high moral standard. The importance of personal integrity of people and institutions governing water is widely acknowledged and enshrined in concepts such as good governance or social accountability. Corruption, the "abuse of entrusted power for private gain", is the antonym and opposite of integrity. Corruption is not a water-specific issue, but in the water sector, the impacts are often felt by the most vulnerable members of society. Frequent corruption scandals in the water sector across all regions of the world are the most obvious indicator for the need to improve integrity in the water sector. Corruption is pervasive and affects all aspects of the water sector, from water resources management to drinking water services, irrigation, hydropower, and natural disaster response. Water management is capital-intensive and involves creating large infrastructures; making procurement manipulation lucrative and difficult to detect. Decision-making in the water sector is dispersed across many political and administrative jurisdictions and defies legal and institutional classification. This allows loopholes to be exploited rampantly. Clientele-ism and kickbacks in contracting are common in all water sectors around the world, especially in developing countries and emerging economies.

Regulation is hardly enforced. At national levels political and economic elites can capture policy development processes and national investment schemes in infra-structure. The costs and impacts of corruption are just estimation. Corruption and integrity issues remain the least systematically addressed governance challenge.

Within the water sector, integrity is compromised in various water management and governance processes across the sector. In many countries there is increasing water demands by and competition between different water users (agriculture, industry, mining, hydropower, tourism, households etc.) and this gives an opportunity for corruption to thrive. The mechanisms of corruption are, however, very complex and do not always fit stereotypical images of corrupt elites.

Integrity issues across processes in the water sector management affect other development areas. Poverty reduction is at jeopardy when financial resources “leaks” out of government budgets. Bureaucratic corruption creates economic inefficiencies, ranging from poor provision of services, bad public investments and non-collection of state revenues, to waste of skills as talented people make corrupt rent-seeking their profession. Corruption increases investment risks and makes it harder to raise much required public and private financial resources for better water services and management.

Citizens bear the direct cost of paying bribes, but also indirect cost of sub-standard services ranging from minor nuisances to loss of life. Impacts of corruption are much broader than on economic growth and service delivery. It undermines social capital and trust, human and democratic rights and the rule of law.

Over the past decade, public awareness on the impacts of corruption on water governance has increased. There is wide agreement that without increased advocacy to stop corruption in water sectors, there will be high costs to economic and human development, the destruction of vital ecosystems, and the fuelling of social tension over this essential resource.

Institutional fragmentation and unclear division of roles and responsibilities contributes to non-transparency and fosters. It will require a multi-stakeholder approach to abate corruption, and safeguard the integrity of governance systems and water systems alike.

The importance of good governance for sustainable development has been recognized and increasingly advocated over the past two decades. Effective corruption control forms a core element of this strategy. Many governments and other stakeholders have put in place anti-corruption commissions, ratified international and regional conventions, strengthened national legislation and put more emphasis on general audit functions. But, experiences suggest that these responses have not been sufficient in making much required change, though in many cases measures are too new for a qualified assessment of their impact. In several countries there have been specific laws, policies, reforms, processes or organizations formed to promote integrity and accountability in public and private decision-making and water resource and services management. These conventions, as well as general laws, policies, reforms, processes and organizations, provide an enabling environment for countering corruption and promoting integrity, transparency and accountability in the water sector. Undertaking diagnostic and forensic scans using appropriate tools such as Integrity mapping help identify the hotspots of corruption. After diagnosis, appropriate interventions are needed at policy, legal, institutional and management level to curb corruption. Lessons have already been learnt, tools have already been tested and applied and policies, rules and changes in institutional mechanism have been undertaken. Some examples include strengthening procurement systems, consumer redress and influence, increasing accountability and

transparency in water projects, public expenditure tracking, strengthening capacities and awareness among water managers, regulators, and decision-makers.

Improving water integrity emphasizes the need for holistic and systemic changes, increasing resilience and adaptability of water management systems, and a stronger focus on preventive measures and transparency, accountability and participation. However, it is critical to promote evidence-based water integrity measures. Identifying the right mechanisms to target anti-corruption measures and integrating them into natural resource management is, therefore, highly relevant. Existing successful interventions are often pilot projects and isolated efforts. The rules of statistics alone determine that the biggest successes will always be recorded in small-scale projects.

CHAPTER 2: THE STUDY

2.1 OBJECTIVES OF THE STUDY

The overall objective of this study is to contribute to enhance integrity in irrigation sector and hence for its sustainable development.

The specific objectives of the study are;

- Identification of major integrity risks in the identified stages of Irrigation development process, and
- Suggesting appropriate interventions to mitigate the identified risks.

2.2 LIMITATION OF THE STUDY

The study looks into integrity aspects at various stages of Irrigation projects, particularly of projects developed by public sector. It neither measures nor looks into corruption of individuals or public and private agencies involved in irrigation development.

2.3 APPROACHES AND METHODOLOGY

A few studies on integrity assessment on water resources sub-sector have been carried out in the past in Nepal. However, there is no recorded integrity perspective study on Irrigation development process in Nepal. The studies carried out elsewhere, particularly in African and other Asian countries have revealed that each water sub-sector, e.g. irrigation, hydropower, water supply and sanitation, across countries, has been found low in the integrity mapping scale; the extent and magnitude of corruption may be different ranging from petty corruption to grand corruption and even to systemic corruption.

Each country has adopted its own measures to combat such low integrity issues. They have anti-corruption laws and institutions in place to fight with corruption. All governments are committed to control corruption in their respective countries.

In Nepal, water sub-sectors are found to be affected by corruption as there has been huge investment and there is lack of transparency and accountability. Commission for the Investigation of Abuse of Authority (CIAA), an apex and constitutional anti-corruption body has investigated a number of cases of abuse of authority in water resources sector.

The methodology adopted for the study relied on the information gathered from the secondary sources such as available documents, information from the individuals in the sector. The gathered information is analyzed and is presented as a research report.

2.4 STRUCTURE OF THE REPORT

The report is presented in five chapters. The first chapter deals with background information on the irrigation development in Nepal and the need of the Integrity mapping of water resources including irrigation projects. The second chapter details about the mapping study. The third chapter describes about the information related with the study. The forth chapter analyzes to what extent integrity aspects have been addressed and incorporated at various stages of irrigation development. The last and final chapter provides conclusion of the study and provides recommendations to improve integrity in irrigation development process.

CHAPTER 3: INTEGRITY MAPPING STUDY OF IRRIGATION PROJECTS

3.1 INSTITUTIONS INVOLVED IN IRRIGATION DEVELOPMENT PROCESS

The existing institutions, which are directly or indirectly involved in policy, planning, and developing programs and implementation of irrigation development process includes;

National Development Council (NDC)

This is a high level policy making body, constituted in June 1972, to provide key directives for the preparation of overall development plans of the country to realize the concept of a balanced regional development. The Prime Minister heads the NDC. Its membership is drawn from various walks of life including political circle, social workers, technocrats and bureaucrats. It is designed to guide the National Planning Commission on matters of policy and program.

National Planning Commission (NPC)

It is a planning body with jurisdiction over all ministries and public sector agencies to formulate periodic and annual plans and oversee its implementation in an advisory capacity. The Prime Minister chairs the NPC. It provides final approval of plans of the related ministries. It estimates availability of the resource and allocate among different sectors. The ministries prepare and integrate the budget with inputs from field and other offices through decentralized planning process.

The NPC's function for overall planning and inter-sector coordinating role needs to be made more coherent in terms of linking the inter-sector plans to achieve the National Goal. Also, within irrigation sub-sector under the water sector also, the selection of projects that contribute to alleviating poverty also needs to be coherently prioritized and integrated.

National Water Resources Development Council (NWRDC)

National water Resources Development Council (NMRDC) was constituted in April 1993 with the advent of democracy for wider participation of the cross section of the people for an open discussion on issues of water resources of national importance. It is a high-level water resources policy and coordination institution chaired by the Prime Minister. The membership of the Council is broad-based with representatives from political

parties and people from outside the government. The Water and Energy Commission Secretariat, functions as its Secretariat.

Water and Energy Commission and its Secretariat (WEC/S)

The Water and Energy Commission and its secretariat, during their almost three decades of existence, since their establishment in 1976, have seen development and evolution of many water resources organizations and institutions. These organizations at the government level are dispersed widely, often incoherent, uncompetitive, uncoordinated and structured on ad hoc basis. Through these years, WEC/S has undergone ups and downs on its role particularly in providing inputs for policy.

Ministry of Irrigation (MoIrr)

MoIrr is responsible for formulation of policy, plans and programs relating to irrigation and the disasters that are water-induced. Scope of work of MoIrr includes formulation of policy planning and execution of programs as regards protection, control and utilization of water resources regarding the irrigation sector. MoIrr is the key ministry with regard to overall development of irrigation infrastructures and addressing the problems of irrigation at the top hierarchical level. It is also responsible for expanding bilateral and multilateral collaboration in irrigation and water induced disaster including the flood management sector.

Ministry of Agricultural Development (MoAD)

This ministry is an important ministry in the context of irrigation development, because agriculture is the end user of irrigation water. MoAD is responsible for policy guidance to enhance agricultural development. It also guides creation of enabling environment for higher agricultural production yield by linking the marketing mechanism for promoting incentives to the farmers to attain food security and alleviation of poverty in the country by coordinated planning and monitoring mechanism.

The sustainability of irrigation infrastructure built to supply irrigation water for increasing the agricultural productivity, depends upon to what extent commercialization of agricultural activities such as input of improved varieties of seeds, credit facilities, fertilizers and pesticides, sales of produced commodities, have been put to the system as a whole, because higher income enables the farmers to spend more for the O&M of the irrigation system. .

Ministry of Federal Affairs and Local Development (MoFALD)

MoFALD is mandated for the formulation of policy on decentralization, implementation of local development programs, monitoring, and coordinating these programs, mobilization of local resources including human resource development. It also takes care of the interests of local institutions, and it is the liaison ministry for local bodies. The functions of the ministry are carried out through five divisions in the ministry- namely, local self-governance, policy, planning and programming, women development, technical division and general administration. Under MoFALD, the Department of Rural Infrastructure Development and Agricultural Roads (DoLIDAR) provides technical support to local community level construction and development works including drinking water and small-scale irrigation projects. As per the irrigation policy, 2003 and the recently approved irrigation policy, 2013 DoLIDAR is responsible to implement all the small irrigation projects (CCA<25 ha in the hills and CCA<200ha in the Terai). With this provision of small irrigation, the role of DoIrr in the hills is reduced and that of DoLIDAR is increased, for most of the irrigation projects in the hills and mountains are less than 25 ha.

Department of Irrigation (DoIrr)

Under the Ministry of Irrigation, the DoIrr is responsible for executing irrigation projects- both surface and groundwater, including operation, maintenance and system improvement for better water delivery with reliability, equity and adequacy. In addition to that, it is also responsible for planning, and design of major and minor irrigation systems.

National Irrigation Development Committee (NIDC) has been formed with a view to implement large irrigation programs/projects and to utilize limited resources. The Secretary, Ministry of Irrigation is the Chairperson of the Committee. The Committee includes members from various ministries, departments and related agencies.

Irrigation is one of main uses of water resources for consumptive uses. DoIrr and its presence down to the project level all over the country plays important role in irrigation development and in the use and maintenance of the irrigation systems. In the past five decades, the department implemented projects through central project and district offices in almost every part of the country. The concept of district level offices was relatively new. This was introduced in the late eighties, when a campaign for meeting basic needs was gaining ground. In 2001, DoIrr was restructured in such a way that two or more district level offices, which were the lowermost bodies of the agency, were merged into one Division Office. Some of the district offices were not merged to any

division, and renamed as sub-division offices. The only difference between a division and a sub-division office is its jurisdiction- many districts or one district. Accordingly, the structures of the offices also vary. In large irrigation systems, separate divisions have been created basically to look after the operation and maintenance of these systems. Similarly, groundwater potential districts have their own separate divisions and there are mechanical divisions for the maintenance and mobilization of heavy equipment.

Department of Agriculture (DoA) and the Department of Livestock Development & Services (DLDS)

These departments are responsible for dissemination of technologies to improve agriculture, fisheries and livestock productions. Nepal Agricultural Research Council (NARC) is an autonomous body responsible for agricultural research leading to development and verification of appropriate technologies.

Local Government

The seventy-five district development committees (DDCs), and 191 municipalities and little more than three thousand village development committees (VDCs) basically form the local level governments. The decentralization policy through Local Self Governance Act, 2055 and Local Self Governance Regulations 2056 enacted thereafter have considered DDCs as the main development planning and implementation units at the local level.

The capacities of the local bodies in terms of planning and implementation of the local level (small) irrigation and tube-well schemes is weak and hence, there is a need to strengthen their capacity. Despite the fact that the local government operates under its own autonomy, the technical linkages to the concerned regional or central departments need to be maintained.

Non-Government Organizations

Water Users' Associations

In order to improve the productivity and sustainability of irrigation system, Irrigation Policy, 2013 focuses on "demand driven principles and participatory management approach" to promote local initiatives and active participation of beneficiaries. The policy also encourages creation of legalized WUAs in private and public irrigation systems and allows WUAs to get involved in the planning, design and construction of irrigation facilities and to take full or joint O&M upon completion.

Based on the institutional requirement of participatory approach, in each of the AMISs or government assisted Farmer Managed Irrigation Systems (FMIS) a formal WUA currently exists or is in the process of formation in the case of on–going or new construction. The existing WUAs in the irrigation systems are not functioning satisfactorily as expected.

INGOs

International non-government Organizations such as CECI, USAID, CARE/Nepal, UMN, CEDPA and UNFPA/Nepal are involved in various sectors of development works and socio-institutional works in Nepal. Bilateral cooperation agencies like USAID, JICA, HELVETAS/Switzerland, GIZ/Germany, SNV/Netherlands and DFID/U.K. are involved in infrastructure development works including drinking water supply and irrigation projects. The cooperation of Government of India in the past is especially noteworthy , which was available under various bilateral agreements.

NGOs

Although there are about 30,000 non-government organizations (NGOs) in Nepal, a very few of them are involved in the irrigation sector. Almost all the NGOs are involved in the software component like agricultural extension activities, training, organization of WUAs, capacity strengthening of WUAs, resource generation and mobilization activities, etc. Usually the donor agencies involve the INGOs and INGOs in turn involve NGOs in their own way.

3.2 POLICY AND LEGISLATIVE FRAMEWORK IN IRRIGATION SUB-SECTOR

Irrigation Policy, 1992 (Revised-1997); Irrigation Policy, 2003 and Irrigation Policy, 2013

The first elected government after the restoration of multi-party democracy in 1990 promulgated Irrigation Policy in 1992 to streamline the efforts in irrigation development. The policy had objectives of cost-effectiveness and sustainability, uniformity in implementation procedure, reduction of government's involvement, preserving traditional irrigation methods, institutional reform, and research capability enhancement. The 1992 policy was amended in 1997 with emphasis on rehabilitation of FMISs and additional objectives of reducing government's recurrent cost in irrigation and maintaining regional balance.

Irrigation Policy, 2003 with the objectives (i) to extend year-round irrigation service to all irrigable land, (ii) institutional development of user's organization for sustainable management, and (iii) develop knowledge, skill and institutional efficiency of technical manpower, user's association and non-governmental organizations involved in the development of irrigation sector. Important policy initiatives include declaring "Irrigation Zone" where irrigation facility has been made available and farmers are required to seek government approval before putting the irrigated land beyond agricultural use, project to be formulated on the principles of IWRM, year-round irrigation to be made available through use of all possible sources such as water reservoirs, ground water, and rainwater harvests. Other policy initiatives include involving private sector in construction, operation and management of the irrigation system, agency managed facilities to be transferred to users for operation and management and capability of local bodies and user association strengthened. The policy goes on to provide guidelines for carrying out study, identification and selection of a project, project implementation procedure, procedure for organization and registration of water users association, resource mobilization and people's participation in implementation of a project and system management, irrigation service charge, among others.

Irrigation policy, 2003 had a provision to revise and update the policy in every five years and accordingly it was revised by the cabinet on July, 2013.

There is a great departure in the present Irrigation Policy, 2013 from the earlier policies. Integrated Water Resources Management in the river basin in the irrigation planning, preparation of irrigation master plan on a national and district level, declaration of ‘Irrigation Zone’ and prior approval of GoN for any other use in the irrigation zone among others have been provisioned. Year-round irrigation with storage schemes, integrated water resources management with other sub-sectors and involvement of local bodies according to the decentralization policy are stressed in the irrigation policy-2013. Thus, this policy clearly depicts a realization of all involved in the development of the sub-sector that utilization of perennial source including multi-purpose storage schemes have to be resorted to, if cropping intensity in irrigated agriculture is to be increased with year round irrigation. Another provision of this policy which is a continuation of the Irrigation Policy 2003 is that implementation of small irrigation system (CCA<25ha in the hills and CCA<200 ha in the Terai) is to be carried out by the DoLIDAR. In this way a large portion of the irrigation command area particularly in the hills falls under the jurisdiction of DoLIDAR whereas the role of DoIrr is limited to the medium to large irrigations systems, groundwater irrigation and non-conventional irrigation.

Objectives set by Irrigation Policy, 2013 are:

- To increase productivity of agriculture by the sustainable development and extension of irrigation by effectively utilizing the country's water resources.
- Maintenance of irrigation infrastructures, effective water management, modernization of irrigation and new construction of irrigation projects to provide year round irrigation service to the irrigable land;
- Conjunctive use of surface and ground water for irrigation;
- To develop balanced and coordinated irrigation in all parts of the country based on feasibility; and
- Improvement of organization and enhance capability of staff in order to develop technology for the development of multipurpose reservoir type projects and inter basin water transfer projects.

Water Resources Act-1992, Water Resources Regulations-1993 and Irrigation Regulations-2000 (Revised 2004)

The Water Resources Act, 1992 prescribes that WUAs have to be autonomous corporate bodies with continuous succession. Regulations covering the registration and basic constitutional requirements for WUAs have been drafted and are under practice in various agency intervened irrigation systems. They need to be evolved through practices and experiences gathered. GoN brought forward the Water Resources Regulations, 1993 under the provision of the Water Resources Act, 1992. The Regulations empowers GoN to form a District Water Resources Committee for granting licenses for water resources utilization (Rule 8). One special feature of the Water Resources Act, 1992 is that it has set priority order for uses of water resources, according to which irrigation use has been given second priority, next to domestic use. GoN has also enforced Irrigation Regulations in 2000, which was revised in 2004. This legal document has further made detailing of provisions made in the concerned policy and act.

Water Resources Strategy (WRS), 2002

In 2002, Nepal formulated a national strategy for the development of water resources sector with a goal to significantly improve living conditions of Nepali people in a sustainable manner. The WRS was prepared following a rigorous process of identifying first the issues in different sub-sectors and setting objectively verifiable targets for short-term (up to 2007), medium-term (up to 2017) and long-term (up to 2027). Several strategies have then been adopted to achieve these different sub-sector targets. Another noteworthy feature of the WRS is that it assumes Integrated Water Resources

Management (IWRM) as the approach to the development of sector. In this section, only the strategy adopted in the irrigation sub-sector and the strategic targets have been considered worth highlighting.

WRS has identified 'Appropriate & Efficient Irrigation available to Support Optimal, Sustainable Use of Irrigable Land' as the output to be expected by the end of 2027. The strategic targets set by WRS in irrigation sub-sector are:

- Year round irrigation to be increased to 50% of irrigated land by 2007;
- All agency managed irrigation systems to be managed jointly with WUAs by 2007;
- Year round irrigation to be increased to 66% of irrigated land by 2017;
- 80% of all irrigable land to be served by irrigation systems by 2017;
- APP target regarding irrigation to be achieved by 2017;
- 90% of all irrigable land to be provided with year round irrigation by 2027;
- irrigation efficiency to be increased to 60% by 2027; and
- Nepal's food security to be maintained throughout the 25 years of strategy period.
- The set of activities, which forms GON's approved strategy for irrigation development is listed below:
- Integrate irrigation planning and management with agricultural development.
- Improve management of existing irrigation systems.
- Improve planning and implementation of new irrigation systems.
- Develop year-round irrigation in support of intensification and diversification of agriculture.
- Strengthen local capacity for planning, implementation and management of irrigation.
- Encourage consolidation of land to promote irrigation/agriculture efficiency.
- Improve groundwater development and management.

Agricultural Perspective Plan (APP), 1995

Nepal Agricultural Perspective Plan (APP), 1995 has identified irrigation as the key input for agricultural development taking into consideration a large still undeveloped potential of the irrigation sub-sector.

The APP has, in its strategy for a growth, given first priority in accelerating the agricultural growth from 3% to 5% per annum through concentrated investment in four input priorities out of which irrigation is the foremost. In the hills and mountains, surface irrigation is emphasized to utilize all the potentialities of streams to double the year round irrigation area. For the Terai, in addition to rehabilitation and effective use of existing surface irrigation schemes, new groundwater schemes mainly shallow tube-wells (STWs) are considered vital for the first half of the plan period (1995-2015). In the plan, the management goal of the irrigation efforts is to expand farmer ownership and

operation. Nearly all the schemes presently under agency management should become either farmer managed for small and medium and convert into joint management for the large systems by the end of the period. The APP has proposed to enhance agricultural growth by 2% (from 3% to 5%) per annum thus reducing the rural poor to 30% by the end of the two-decade plan period.

National Water Plan 2005

The National Water Plan was approved by the government in 2062 (September 2005). The Plan was developed to implement the activities identified by the WRS in three different time periods- short-term (by 2007), medium-term (by 2017) and long term (by 2027). The commitment of the government to implement the Plan has been reflected in the periodic development plans.

Detailed targets in the short term (by 2007) were to develop and establish appropriate policy and legal framework to achieve the outputs mentioned in the policy and legal framework. They include: (1) Integrated Water Resources Policy is approved, (2) Sub-sector policies, Acts and Regulations are reviewed, (3) Water Resources Act/Regulations are amended and enacted, (4) conflicting water-related laws are amended, (5) Water use rights are established, and (6) People are made aware of rights and obligations.

The National Water Plan (NWP) has been prepared to encompass program in all strategically-identified output activities so that tangible benefits can be delivered to all the people in line with the basic needs. Specifically, the NWP has been developed to implement the outputs of the Water Resources Strategy (WRS).

Thirteenth Plan (2013/14 to 2015/16)

The current thirteenth plan (2013/14-2015/16) has set goals, strategies and working policies for irrigation sector. The Long Term Vision of the Irrigation Sector is to provide sustainable and year round irrigation service to all the agricultural land of the country to help increase agricultural productivity.

Strategies

- Prioritize the implementation of small and medium surface and groundwater irrigation projects which can provide immediate returns and generate employment opportunities.
- Provide year-round irrigation facilities through multipurpose reservoir and irrigation programs run under inter-watershed, water transfer, and water resource projects.

- Foster coordination among stakeholder agencies and interrelated programs while running irrigation programs.
- Enable users' committees to render management and operation sustainable, efficient and effective and to regularly and periodically repair and maintain systems.
- While developing and running irrigation structures, ensure that studies, research, design and execution are environment-friendly, adaptive to climate change, and participatory and that they generate employment.
- Make irrigation services sustainable and reliable by requiring that the costs of repairs and operation be borne by the concerned water users.
- When implementing irrigation schemes, ensure that local environment-friendly ponds, lakes, wetlands and fountains are protected and promoted by forging consensus with other concerned agencies.

Working Policies

To address the issues related to development and extension of irrigation area, national and district level master plan shall be prepared and implemented addressing the integrated development and management of river basins.

Government of Nepal shall declare 'Irrigated Area' where irrigation facility is available in the area. Provision shall be made for permission of Government of Nepal as per necessity for any non-agricultural use of land within the declared Irrigated Area.

Necessary collaboration and partnership shall be made with the governmental and non-governmental stakeholders and local bodies to increase production in the irrigated area.

Based on the variation of geography and topography necessity and importance of different types of irrigation technologies, infrastructures and sources shall be considered and optimally used. Additional study and research shall be emphasized in this area.

Principle of integrated water resources management (IWRM) shall be followed during the planning of irrigation projects.

- Irrigation projects developed in the past to supplement seasonal rainwater shall be developed to provide year round irrigation by constructing reservoirs, rainwater harvesting systems, and by developing, maintaining and using groundwater resources.
- Appropriate drainage systems shall be developed in the water logged area of irrigated land.

- Reservoir-based and Inter-basin water transfer types of projects shall be implemented on a priority basis.
- Projects of national importance shall be constructed by mobilizing internal and external sources.
- Available groundwater reserve shall be developed and utilized as an important source of irrigation and appropriate methods shall be adopted for its preservation, conservation and quality control. Organizational reforms as outlined in the National Water Resources Strategy and National Water Plan shall be made for this.
- Information management system regarding irrigation shall be reinforced.
- The policy of involving private sector, cooperatives and community based organizations in construction, operation and management of the irrigation system shall be pursued.
- Effective involvement of local bodies and water users' associations shall be emphasized in the planning and construction of irrigation projects and in the development and management of local level small irrigation systems.
- Participation of local bodies and water users' associations shall be increased by timely communicating information related to the project.
- Gender equity, positive discrimination and social inclusion shall be ensured in the irrigation sector.
- Poverty alleviation through the development of irrigation sector shall be emphasized.
- Research and development capability of the irrigation sector shall be enhanced.
- Programs related to climate risk management (CRM) and disaster risk management (DRM) shall be implemented to address the effect of climate change. Adaptation and mitigation measures shall also be considered.
- Improvement in the prevailing legal and institutional provisions shall be made for the implementation of international agreements and standards related to irrigation.
- Necessary legal and institutional improvements shall be made to achieve the objectives mentioned in this policy.

Political instability, conflict, insecurity, lack of financial resources, lack of suitable environment for foreign investment and bureaucratic hassles are often cited as

impediments for irrigation development in Nepal. Corruption and lack of integrity is one of the main reasons obstructing Irrigation development in Nepal. Transparency International in its global corruption report, 2008 has cited Irrigation development as one of the most important water sub-sectors which offer large opportunities for corruption which most often stems from large investments and highly complex engineering projects.

Although Irrigation policy has emphasized on Irrigation development process to be made simple, and transparent, present development process still seems very cumbersome and requires passing through many stages. As there has been no study on Irrigation development process from integrity perspective, this present study attempts to examine current Irrigation development process in Nepal through integrity lens and suggests appropriate measures to improve and enhance integrity in Irrigation development process.

3.3 IDENTIFICATION OF IRRIGATION DEVELOPMENT STAGES/PROCESS

Irrigation development process for the construction of new irrigation project and for the rehabilitation of old irrigation is not simple and involves the following stages:

Information Dissemination

The concerned irrigation division/sub division office at local level disseminate information about various programs, objective and implementation procedure, publishing in notice board, local newspaper, and organizing seminars and local gatherings

Farmers Request

Farmers or water users group need to fill the demand form made available by the concerned irrigation office with complete details and submit it with their signatures. The group is required to deposit Rs. 50/ha. If the project is found not to be feasible, the deposit amount is returned to the users group.

Screening and Identification Survey

The concerned irrigation office needs to verify the proposed irrigation sub-project through field inspection accompanied by the technician from district agriculture office as well. During inspection before preparing report, field technicians need to be convinced by farmers and the users group ensuring that they will take O&M responsibility of the project in future. If farmers do not agree to undertake O & M responsibility, the proposed irrigation project is dropped and the deposit amount is returned.

Prioritization for feasibility study

The next step is to prioritize projects and enlist them for feasibility study in next year's annual program.

Feasibility Study

A feasibility study of the prioritized project is carried out and the feasibility report is prepared. Mobile Irrigation Team from regional office will also assist to prepare feasibility study. The ad hoc water users committee is required to form at this stage in order to obtain their approval for the costs to be borne by the command land to contribute for irrigation system.

Appraisal and approval

Once the feasibility study report is prepared, it is forwarded to the respective regional office for appraisal. The regional office has authority to approve the project which has a cost of upto Rs 10 million. If the cost of the irrigation project is above 10 million, the regional office is required to submit the project to the Director General of the department for appraisal.

Detailed survey and design

Once the project is appraised the detailed survey and design of the project will be carried out based on PDSP manual and other relevant documents. Working drawings are prepared and cost estimates are made. The costs to be borne by the office and water users group are worked out and informed to the users group. The cost estimate is approved by the respective officer who has authority to decide as per procurement act.

Registration of Water Users Association

Water Users Committees are required to register formally. The functionaries of WUA are trained to carry out different activities and programs. At the same time the WUA is required to deposit 0.5% of the project cost that includes the upfront cash deposited at the beginning in a bank. The account is jointly operated by the WUA and the respective irrigation office and after the completion of the project the account is returned to WUA for O&M of the system.

Memorandum of Agreement

Before starting the construction of the project, the concerned irrigation office and WUA need to enter into agreement by signing a memorandum of agreement in which the cost

to be borne by the WUA as per irrigation policy and the responsibility of WUA is clearly stated after the project is commissioned..

Project construction

The construction of irrigation project is done through National Competitive Bidding as per Procurement Act. The supervision of the construction work is done by concerned irrigation office with the help of the WUA. Usually in donor assisted project, donor's bidding document is used otherwise bid document given in PPMO website is referred with minor changes as per project. Bid document is evaluated by concerned office.

Commissioning

Once the construction of an irrigation project is completed, it is jointly verified by the concerned irrigation office, agriculture office and the WUA. If any mistake or remaining work is found, the contractor is asked to complete. The construction work is finally ratified by the said offices. Finally, a project completion certificate is signed between the concerned irrigation office and WUA and a copy of the certificate is sent to respective regional office and the department.

Operation and Maintenance

The operation and maintenance of irrigation project is the responsibility of the users group. The concerned irrigation office needs to provide water management and O&M training to WUA to enhance their capacity..

3.4 CASE STUDY

Case I : Community Managed Irrigated Agriculture Sector Project (CMIASP)

Introduction

The CMIASP was supported by a Loan Agreement between the Government of Nepal and the Asian Development Bank (Loan Number 2102-NEP(SF)) dated 23 December 2005 for a total of SDR 13,615,000 (equivalent to about US$ 20,000,000). The loan became effective in January 2006. In addition, CMIASP was supported by a Loan Agreement between the Government of Nepal and the OPEC Fund for International Development (Loan Number 1060P) dated 21 December 2005 for a total of US$ 7,000,000.

The overall goal of the CMIASP was to promote inclusive economic growth while reducing poverty in the rural areas of the Central and Eastern Development regions of Nepal. Its specific objective was to improve agriculture productivity and sustainability of existing small and medium-size farmer-managed irrigation systems (FMIS) suffering from low productivity and high poverty incidence, and thus enhance the livelihood of poor men and women including ethnic minorities and Dalits. To achieve the objective, the Project would (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.

The Project's expected outcome was to enhance productivity and sustainability of FMIS by (i) providing improved measures for WUA mobilization, rehabilitation and expansion of irrigation infrastructure, agricultural development, and targeted livelihood enhancement for 270,000 households covering 34,000 ha (including 8500 ha of expanded command area); and (ii) strengthening policies, plans, institutions, and operational mechanisms for more responsive service delivery and sustained aspects. By 2015, the expected policy and institutional reforms were to be achieved, and the following targets achieved through 210 subprojects: (i) cropping intensity increased by 40%; (ii) annual crop production increased by at least 51,000 tons; (iii) gross margin per farm family increases by 70%; (iv) permanent employment increases by 3.3 million days; and (v) annual farm income of landless farm laborers increases by over NRs 2,000.

Project Implementation Modality

CMIASP passes through a step-by-step 4 stage procedures. At each stage the multiple stakeholders are required to carry out a number of defined tasks. A brief of each stage is first enumerated and thereafter more detailed steps are suggested to follow while implementing the subprojects.

Stage 1: Subproject Identification, Scheme Verification and SPPR Preparation

The first stage includes information campaign, submission of application by WUAs; screening of the applications and initial prioritization at IDD/SDs, scheme verification at field level; finalization of prioritized schemes, GPS joint walkthrough survey and Sub Project Preparation Report (SPPR) preparation for approval. In undertaking these tasks due attention is to be paid by the Sub project Management Unit (SMU) to the likely issues of voluntary land donation, impact on indigenous people and environment.

Stage 2: WUA Institutional Development and Detailed Design

In this stage a concerted focus is given on user farmers' organization creation and its strengthening. So the AO of IDD/SD provides help to the user farmers to draft WUA constitution, form a representative WUA executive committee with 33% females, and facilitate to register WUA. Meanwhile, a detailed design of the scheme is undertaken by the SMU with participation of the users. The proposed design has to be approved by a general meeting of the farmers. After concurrence an MOA detailing the respective responsibilities is signed between the SMU and the registered WUA.. The WUA is required to set up a Construction Monitoring Committee (CMC) of users and select a Community Organizer (CO) at this stage.

Stage 3: Approval of Detailed Design, Tendering and Construction

This stage relates to tendering and construction activities. After the signing of MOA the detailed design is submitted by the IDD/SD to the concerned authority for approval and after the approval the tender notice is published. Meanwhile the WUAs is required to initiate work as part of their contribution and has to complete at least 30% of the total contribution work before the contractor is mobilized. On the other side the IDD/ SDs completes the evaluation and awarding of the tender and mobilizes the contractor for project funded civil works. At this stage the Centre Project Management Office (CPMO) needs to organize a training on quality control for the WUAs' Construction Monitoring Committee (CMC) members. The CMC is required to monitor the construction work and record each day's progress. The completion of construction is followed by a Test Run and Rectification of the structures and canals. Thereafter a joint inspection of the civil works is carried out by WUA, IDD/SD and the contractor; and a completion certificate is signed. During this stage the ICWM planning is also started and a contract for WUA on-farm water management infrastructure is awarded. When the construction works are completed, the CMC is transformed into O&M subcommittee.

Stage 4: Initial O&M, Agriculture Development and Post Construction Monitoring Support

The IDD/SDs encourages the WUAs for regular O&M of the constructed/rehabilitated irrigation system. For this IDD/SDs will conduct O&M planning training for each subproject. The O&M subcommittee will be trained for O&M planning and will be assigned the O&M responsibility of the system.

In this stage On-farm Water Management activities shall be effected by IMD/SMTP. Similarly, the DADO with the support of ASC located near subproject area will carry out the agriculture extension support program under the project. Each subproject will have Agriculture Development Plan (ADP) for the ISP area and DADOs implement the ADP through its ASC.

For the first one (1) year the IDD/SD will regularly monitor the ISP and offer support to the WUA to enable them monitor the performance of agriculture.

In the following section a step-by-step process of subproject implementation during each stage is discussed at a greater length;

Assessment of the project

Overall, the project is rated as successful by the consultant (PCR of CMIASP 2014) in accordance with the review of its relevance, effectiveness in achieving outcome, efficiency in achieving outcome and output, sustainability, and impact. This indicates that the design and implementation were acceptable and the project had more or less the development impact anticipated at the time of appraisal. The project was consistent with the government's development priorities at the time of approval as well as at the time of completion. The project was implemented as conceived and to an acceptable level. It achieved its overall impact of improving agriculture production. The Project was efficient but less likely sustainable if support for system O&M is not improved; the Project almost achieved 100% of its planned outputs and the requirements of the design and monitoring framework were mostly met, with partial success in some areas, in particular ensuring sustainable O&M of the systems.

Lessons

Lessons learned from past projects focused on the need for improving support to WUA and the creation of capacity to do so, improved linkage with the DOA for agriculture support, empowerment of WUAs through their involvement in subproject planning, improvement of subproject planning through participation of private sector firms, adoption of a more low cost design approach, improved quality control and above all better support for post construction system O&M. Many of these lessons learned from past projects are still valid for the present project. DOI's capacity in promoting beneficiary participation remains weak and this weakness could not be fully mitigated by outsourcing social development and WUA capacity building to NGOs. Involvement of the WUAs in subproject planning was successful especially after the introduction of a structured, GPS based joint walkthrough survey methodology. The participation of private sector firms for subproject planning failed because of the poor and inconsistent performance of these firms. Adoption of a more low cost design approach did not materialize, the main subproject rehabilitation cost items were RCC lining in the hill irrigation schemes and the conventional concrete diversion and intake structures in the Terai irrigation systems, Quality control was improved and construction quality was satisfactory in most of the subproject The main weakness of the CMIASP is the limited support for O&M. From past projects it was concluded that WUA commitment, ability, and leadership were essential for effective O&M and clear O&M plans should be developed before handover. Supervising completed FMIS with annual technical, social, and financial audit should be done. The preparation of O&M plans was limited to regional training in which 2 representatives of each of the WUAs participated. No

arrangements have been made for supervising completed FMIS with annual technical, social, and financial audits, more specifically the following key lessons were identified:

Project Institutions; the Central Project Management Office (CPMO) was responsible for project implementation vis-a-vis the ADB but it did not have implementation authority. The authority for project implementation was imbedded in the regular structure of DOI (DG/DDG -> RID -> IDDs/IDSDs). A Project Management Office can only perform efficiently and assume its responsibilities if it also has the executive authority. The CPMO performed a crucial role in the implementation of the Project and the success of the Project can in large part be attributed to the management coordination and support efforts by the Directors and staff of the CPMO, However the CPMO could have been even more effective and could have avoided some of the implementation delays if it had been given executive authority as well. The arrangement under the project with the overall project implementation responsibility with the CPMO but the executive authority with the RIDs and IDDs/IDSDs was a limitation for the effectiveness of the CPMO. Regional and division level project institutions, RSPU and SMU, mainly existed on paper only and at these levels the project was implemented through the regular DOI structures. This did not pose any problem except for the lack of coordination between DOI and DOA and its RIDs and RAD as well as the IDDs/IDSDs and DADOs.

Subproject identification/selection; With the cancelation of the DIADS and in the absence of a reliable irrigation inventory there was no reference framework for the selection of subprojects, Subproject could only be selected on their individual merits in comparison with other requested subprojects but it could not be confirmed whether the selected subprojects constituted the most “deserving” subprojects in a particular district. A reliable irrigation inventory should be an essential reference framework for sound subproject selection.

Subproject preparation; The introduction of the GPS/GIS based survey and mapping methodology in combination with structured, automated template driven subproject preparation procedures, data processing and report preparation, which has now been developed as an internet based subproject preparation system, has found wide acceptance in the DOI and has resulted in an acceptable quality and consistency in subproject preparation. The on-line preparation system facilitates supervision and quality control of the preparation process as, through a graphic interface with Google Earth, proposed subproject irrigation coverage, layout and proposed improvements can be overlaid on the high resolution satellite imagery in Google Earth and views in 3D. The structured preparation system has improved the quality of the engineering aspects in subproject preparation; however the collection of social and agriculture baseline data has remained very basic and needs further improvement. Especially for Terai subprojects there is still a tendency during subproject selection to inflate the irrigation coverage to meet the requirement for a minimum coverage of > 200 ha. During

subproject preparation the command area boundaries should be verified and should match the layout of the existing canal system.

Water availability is one of the main constraints for the run-of-the-river surface schemes. Even based on mean flow estimates instead of 80% reliable flows, about 60% of the subprojects still will have, after rehabilitation, seasonal water deficits, especially during the crucial monsoon paddy transplanting window and the 3rd irrigation application for wheat cultivation. For subproject preparation the available flow in the irrigation source was estimated using the MIP non dimensional hydrograph method with spot flow measurement. Water deficit is common for the Terai subprojects, as all the sub basins in which these subprojects are located have seasonal or chronic water deficits. The present way for irrigation development in which schemes are selected based on their individual merits will not adequately address the water deficit problems. Improving or expanding a single irrigation scheme in a water deficient basin may benefit the particular scheme but will not resolve the broader issues in the basin. Improving the diversion efficiency for one single scheme in a basin might even negatively affect the equity of overall water distribution in that particular basin.

Hill versus Terai subprojects; Most of the problems and constraints that have affected the timely completion of subprojects and the post construction sustainable O&M are concentrated in the larger Terai subprojects; The schemes especially the water distribution networks are more complex, water availability in the irrigation sources is more constrained, the social environment is often fractious which produces weak or even dysfunctional WUAs, weak WUAs are not interested or not capable to undertake WUA payable works, and most of the serious construction delays are in the larger Terai subprojects Therefore the treatment of Terai subprojects should be different from the Hill subproject with more detailed surveys of the canal system, present water distribution arrangements and quality of the irrigation services. The effect of upstream abstractions on water availability at the intake point as well as the socio-organization situation in the subproject area should be investigated in more detail, In particular the actual landholding pattern including the presence of hidden large landholdings and the extent of related sharecropping arrangements should be assessed in more depth as such situations affect the sustainability of the systems. Contract management should be given more attention for works contracts in Terai subprojects and cost for post project support should be included in the cost of Terai subprojects.

Detailed design; In general the structural improvements designed were based on the demand by the beneficiaries and focused in the Terai on the improvement of water diversion from the irrigation source and in the hills on the improvement of the water conveyance efficiency of the canal system. In the Terai subproject high cost concrete diversion structures have been adopted as farmers rejected proposals for lower cost gabion diversion structures. In the hill subprojects, RCC lining has been constructed with very positive results and seems much more durable and resistant to damage than

the traditional stone masonry lining. In the hill irrigation schemes design problems that were already identified at the inception of the sector programs 24 years ago and were subsequently addressed in the various design manuals still persist. Not sufficient attention was given to the incorporation of flow control structures to facilitate a more equitable water distribution in the irrigation systems. This has particularly affected equitable water distribution in the Terai subprojects where in most of the tail portions of the command areas are experiencing inadequate water supply after rehabilitation.

Construction; Quality of the construction works was generally satisfactory, with some exceptions for substandard gabion works. However the NVC(National Vigilence Centre) technical audits have observed that the contract management by the IDDs/IDSDs is poor; the contracts had no quality assurance plan, no material or concrete testing was done, contract management documentation such as the S curves were not prepared, it is reported that only 50% of the contractors have submitted “as built” drawingsand standard procedures or finishing the contract as detailed in the general contract provisions and the particular contract conditions of the approved standard bidding document are not followed. One of the main issue with regard to the implementation of construction contracts is the prevalent system of “cascading” contract responsibilities, in which the main contractor defers responsibility for all construction works to smaller less experienced and financially weak construction firms or labor contractors through various layers of informal subcontracts. The informal subcontracting arrangements for which the main contractor’s interest is limited to the commission he receives from the subcontractors are found to be the main causes of the delays in the construction of the incomplete subprojects. Although the bid documents only permit subcontracting with the approval of the subproject authority, the informal cascading subcontracting arrangements are rampant.

Completion of works as per the Subproject design; In carrying out the construction works almost all contractors focused on the major structural works – in the Terai, the head-works and in the hill, the RCC canal lining – and used all the quantities allocated in the contract BOQs for these major works. The result was that in about 80% of the completed subproject the planned flow control and outlet structures have not been constructed or completed. This situation is caused by the fact that in the construction contract quantities for all individual structures are pooled into one general BOQ.

Acceptance of works; In accordance with internationally accepted procedures, construction works are regarded as “completed” after the construction management certifies that they have been completed in accordance with the contract and after signature of the Completion Certificate by the IDD/IDSD and the contractor. The Contractor’s contractual liability ends at that very moment, but in the case of the project it was extended during the “Defect Liability Period”, lasting twelve months. Within this period, the contractor is obliged to carry out, at his own expense, any correction or repair resulting from flaws in the construction works. After signature of the Final

Acceptance Certificate, the contractor is exempted from all contractual liability. These procedures have not been followed; basically when the BOQ in some cases after contract variations, is exhausted the final bill is paid to the contractor which supposedly constitutes the provisional acceptance of works. The contracts have the provision for a "Defect Liability Period" but this is not enforced.

Strengthening of WUAs is based on the assumption that successful WUs can be engineered by introducing commonalities of other successful WUAs. However, successful cooperative action for irrigation management takes place under a set of very context specific condition. Each WUA is the reflection of its local social and organizational environment. Communities, mostly in the hills, that had a stable socio-organizational environment in which the farmers had a more or less equal stake in the management of the irrigation system have reasonably strong WUAs, but most of the larger Terai subprojects with factious social conditions and unequal land distribution have weak or dysfunctional WUAs. This situation has manifested itself clearly in the Project; in none of the 111 WUA, the social development activities have converted a weak WUA to a stronger better organized WUA as the strength or weakness of a WUA depends more on the social environment in the subproject communities and not that much on the individual capacities of the WUA executive committee and WUA subcommittee members

Operation and maintenance of the completed subprojects; Traditional FMIS with temporary structures had to be substantially rebuilt before every irrigation cycle and often several times repaired during an irrigation cycle. These efforts only required labor and local materials. The new permanent structures in the irrigation systems will require preventive or recurrent maintenance for their upkeep. However, the concept of preventive or recurrent maintenance is unknown in traditional FMIS; canals and temporary structures are repaired when damaged. Famers are unlikely to invest time and money in preventive maintenance as long as the water supply from the system is stable. Regular maintenance does not significantly increase the actual water flow in the canal, despite the link between maintenance and irrigation system's efficiency. In addition the WUAs are totally unprepared for the maintenance of masonry and concrete structures including the mechanical devices. The O&M and water management plans prepared during regional trainings with the participation of only two representatives of each of the WUAs only served the purpose of compliance with the loan covenants but are of little practical use for significance for instilling the concept of preventive/recurrent maintenance in the WUAs. The most likely scenario for most of the subproject is that the permanent infrastructure will slowly deteriorate until major damage occurs, which will then be repaired by the farmers with temporary measures that will decrease the system's efficiency and gradually revert it to its pre-project condition. To prevent this scenario from occurring better more system specific O&M plans have to be prepared

and arrangements have to be made that compel the IDDs/IDSDs to provide regular support for the implementation of the O&M plans

Training; the tendency under the project was to provide all orientation and training through regional level training sessions, seminars and workshops. Regional orientation of local NGOs and training of IDD/IDSD staff was effective especially with regard to orientation on project procedures and the introduction of the new subproject preparation methodologies. The effect of training of IDD/IDSD staff was diluted as result of the frequent staff transfers. The DOI has no structured system for knowledge management or knowledge retention/transfer.

Social and Environmental Safeguards; although all the targets set in the gender action plan were not met, the achievements have been very encouraging considering the limited operational capacity of DOI in this field. The target of 33% women members in the WUAs was almost achieved with the average representation of 30% of women in the WUA executive committees. But only 6% of women hold executive positions in the WUAs and only 40% of the WUAs meet the minimum criteria for 33% female officers. Participation of women in WUA related training activities is also below the target of 33% (20 to 30%). However participation of women in agriculture related training was high; about 48%, and especially the percentage of female COs is very high; 87%. The project was successful in targeting benefits to Dalit communities; however the representation of Dalits in the WUA executive committee is insignificant with only 2% of the committee positions filled by representatives from these groups.

Environmental Impact; Since all the subprojects were existing FMISs, the adverse impact on the environment was limited to the construction activities. As per the EPR of GoN, formal IEE was not required for the rehabilitation of such systems. However, since the subprojects were classified under the Category B of SPS by ADB, IEEs were prepared for all subprojects. ISPMC prepared an environmental monitoring report (EMR) template for monitoring of the EMPs. Since the IDDs/IDSDs did not prepare the required EMRs, ISPMC has prepared the EMR for all the subprojects In order to comply with the environmental safeguard requirement. Applications of the present environmental safeguards mainly serve to comply with ADB and GoN requirements. Real environmental concerns are lost in the very standardized and template driven preparation and monitoring approach. The main environmental impact of Terai irrigation rehabilitation is the replacement of temporary diversions with permanent concrete structures that may severely alter the downstream flow regime in the rivers or streams. In the hills the main environmental impact is the effect is the increased water discharge in the main canal which may have on slope stability. Overtopping or breaching of canal sections that were not rehabilitated or sufficiently adapted to the increased discharge may overtop, breach and cause slips or landslides, and increased availability might lead to expand irrigation to steep/unstable slopes which might also lead to slope failures.

Case II: Irrigation Water Resources Management Project (IWRMP)

Introduction

The IWRMP was initiated in 2008 with the aim of supporting the national goal of poverty reduction and to develop Nepalese irrigated agriculture through irrigation development and management. The project was implemented with the grant assistance of the World Bank (WB), along with direct contribution of Water Users Associations (WUAs) and the Government of Nepal (GoN). The total cost of the project was US$65 million, out of which $50 million is grant assistance from the World Bank and the remaining $10 and $5 million is contributed by GoN and WUAs respectively.

Basic concepts in the formulation of the projects were;

Acceleration of agricultural growth- a key focus area of Poverty Reduction Strategy Paper (PRSP 10th plan)

An improved and expanded irrigation system and key transformation input for agricultural growth

Enhancement of water control and management; facilitate complementary investments in improved seeds, modern inputs and agronomic practices and market related investments; which together will raise crop yields, cropping intensives and farm incomes.

Project Objectives

The objectives of the proposed project were to: (i) improve irrigation service delivery, and (ii) enhance sustainability and productivity of selected irrigation systems in Nepal. This will be achieved through (a) irrigation infrastructure development and improvement; (b) completion and consolidation of irrigation management transfer reforms; and (c) institutional and policy support for better water management and productivity. The realization of these objectives will be measured by: (1) improvement in indicators of irrigation service delivery; (2) greater collection and more effective use of water charges by WUAs; and (3) increase in farm income through improvements in crop yield, cropping intensity and diversification into higher value crops.

Project Components

The IWRMP has following four components;

A. Rehabilitation and Modernization of Irrigation Infrastructure
B. Irrigation Institutional Reform

C. Institutional and Policy Support for better Water Resources Management and productivity
D. Integrated Crop and Water management Component

Procedural Guidelines

In order to be assured in implementation quality the following guidelines were developed and practiced so that all steps could be controlled for integrity of the project.

Surface Water Schemes

Step 1: Information Dissemination: The Irrigation Development Division (IDD), Irrigation Development Sub-Division (IDSD) and District Agriculture Development Office (DADO) and their sub centre (ASC) would be responsible for disseminating information on Component A type of subproject, principles and procedures for their selection and implementation, to all beneficiaries in those areas having the potential for enhancing irrigated agricultural practices utilizing surface or ground water resources. The regional irrigation directorate (RID) with assistance from the local office of the department of hydrology and meteorology (DHM), Ground Water Field Office (GFO), District Level WUA Federation and Local Bodies would keep and update the sub-basin water resource inventories. At the central level policy makers, politicians, National Irrigation Federation of Water Users Association Nepal (NIFWUAN) and the media would be briefed about the program through workshops and meetings.

Step 2: Application: If Farmers group or existing water user's organizations having no legal identity are in need of assistance to improve or extend their irrigation system or supporting infrastructures would form an ad-hoc WUA committee and then collectively complete an application form. The application is to be signed by all beneficiaries households before submission through the nearest ASC/ASSC to the IDD/IDSD, along with an upfront cash deposit of NRs 50 per ha for surface irrigation.

Step 3: Initial Screening and Selection Criteria: IDD/IDSD technicians with the assistance of DADO staff would screen the application, to verify if it meets the selection criteria for IWRMP support. The selected list would be communicated to the DDC.

Step 4: Identification Survey: IDD/IDSD and DADO/ASC staff would form a site visit team to verify the information given on the application form. The WUA ad-hoc committee would liaise with the visiting team and assist in updating the application form if necessary. The visiting team would then prepare an identification study report based on the identification questionnaire filled in when in the field. In case of unviable Sub-projects, the upfront cash deposit could be returned at this stage.

Step 5: Classification as Major or Minor Rehabilitation: Based on field data collected to date, the Sub-project will be classified by the IDD/IDSD into major or minor rehabilitation, using fixed criteria for hill and Terai area. This would dictate the nature of further studies.

Step 6: Sub-Project Prioritization: The IDD/IDSD would prioritize each sub-project according to the main components influencing the potential development. The prioritization together with the identification report including major and minor classification would be discussed by IDD/IDSD with support from representatives of DADO to finalize the prioritization of sub-projects for feasibility study. The prioritized list would be communicated to the DDC.

Step 7: Feasibility Study: The RID & OPD would undertake the feasibility study. If the sub-project is large or potentially challenging a local consultant could be deployed. The mobile irrigation team (MIT) and RAD staff would extend technical support to the study team as required. The WUA or beneficiary group would be closely involved in the fieldwork and discuss the scope of works and preliminary cost estimates. To ensure uniformity in the feasibility study and its report presentation, the approach detailed in the procedural guidelines would be strictly followed. The report would include screening of alternatives as well as describing the optimum solution; realistic construction cost and benefits estimation for performing an economic analysis and environmental assessment of the sub-projects. SEMP would be carried out according to the guidelines on environmental considerations in the detailed Procedural Guidelines.

Step 8: Social and Environmental Assessment: SEMP will be compulsory for all those projects which do not require IEE or EIA during feasibility study.

Step 9: Appraisal and Detailed Design): The feasibility report would be scrutinized by SAC members, and to include site verification by MIT/TA team if felt necessary, before being technically reviewed and endorsed by the technical assistance (TA) team. If the sub-project is found to be technically feasible and economically viable, the sub-project would be discussed in Regional Project Support Unit (RPSU) and Mobile Irrigation Team (MIT). Then, it is recommended to RAC for their appraisal. If the RAC feels necessary, detailed engineering design of the proposed infrastructures would be undertaken. The detailed design would include site investigations, working drawing preparation and quantity takeoff, to enable an accurate cost estimates to be derived. The MIT would check the designs before a final technical review and endorsement from the TA team. The feasibility report would get recommended to PICC at OPD, before submission to the DG/DOI for approval.

Step 10: Approval and Tender Document Preparation: All the sub-projects in IWRMP will need appraisal and recommendations from SAC and RAC, and then only it will be approved for implementation by PICC through the OPD review. In the case of approval of the cost estimate the financial rules and regulations will prevail.

The approval information would be communicated to RAD, DADO and IDD who in turn would inform the concerned WUA and the DDC. IDD/IDSD would then finalize cost sharing arrangements with the WUA and prepare tender documents based model LCB documents for those works to be undertaken by contract.

Step 11: Resource Mobilization and Implementation Plan: The SMU would discuss with the WUA the program for Sub-Project rehabilitation and include in their District implementation Plan of approved Sub-Projects. These to be submitted to RID who would include it in their annual work (budget) program, to be then forwarded to Central DOI for approval by the National Planning Commission. The WUA would be required to participate with SMU in implementation plan. The plan would specify inter-alia individual responsibilities of WUA, SMU, DADO and RID staff during Sub-project implementation period.

At this stage the WUA would be required to deposit balance of upfront cash to make up 0.5% of the investment cost, otherwise no further works would be undertaken by DoIrr.

Step 12: Formalize Farmer Organization and Participation: The WUA constitution and its by-laws would be formalized by the general assembly of users and the WUA registered with the IDD/IDSD under Irrigation Regulations (1993), which then be informed to DWRC. Technical support and training of the WUA at this time would be provided by the MIT, SMU, & DADO staff and NGOs if required. A memorandum of Agreement (MOA) between SMU and WUA detailing the cost sharing arrangement and work breakdown agreement of all the construction works would be finalized and signed in front of the General Assembly of users group. After this and before construction Baseline Survey would be carried out by SMU and DADO combined staffs. Also social assessment would be conducted by the help of NGO or AO under the guidance of the MIT sociologist according to the guidelines of Social Assessment.

Step 13: Construction: Tenders would be floated for the SMU parts, and contract awarded as per Govt. of Nepal financial rules keeping transparency with the WUA. A construction committee would be formed by the WUA to supervise and monitor the quality of works being carried out both by SMU contract as well as by WUA according to the work breakdown agreement.

After confirmation that WUA have completed 20% of their work contribution according to the MOU, then SMU will proceed with the Sub-project implementation. Such condition will be specially mentioned in the contract agreement with the contractor. Overall contribution of farmers should be at least 10% of the Project Cost.

Training would be conducted by IDD/ RID staff or NGO (if engaged) for construction committee members on quality control and supervision of works. WUA would be encouraged to take part in the final measurement of contract works. WUA part of works would also be recorded and evaluated by SMU. If during construction, variation in the scope of works demands a cost overrun of more than 10% from the original estimate, then the works would be suspended until the WUA contributes in cash or labor, on a pro-rata basis, their share of the cost over-run. MIT would check on construction progress and quality of works. Contract Commissioning: Any piece of contract, when completed should be commissioned by IDD/ IDSD technical staff in association with WUA and contractor within the liability period of contractor. Contractors would rectify the defects noticed duly.

Step 14: Commissioning: After physical completion of works according to the MOA, SMU technicians along with WUA members would conduct a walkthrough of the system during test runs of the system, to identify any defect and operational problems. During the contract maintenance period, the contractor would rectify the defects (if any) that would fall under his liability. SMU would prepare a completion report and organize the signing with WUA of the certificate of work completion in accordance with the MOA. A copy of the report, signed by the WUA, would be forwarded to RID/DOI for recording in their management information system.

Step 15: Operation and Maintenance: After completion, the WUA would receive back the O.5% upfront cash deposit from SMU as potential seed money for future O&M of the system. Thereafter, the DADO/ASC/NGO, the WUA and farmers would strengthen their linkages with other support agencies. SMU/RID or NGO would carry out O&M and water management trainings to WUA members as needed. NGO would provide to the WUA continuing advice to ensure future sustainable agriculture practices. RID would make provision for budgetary support to completed Sub-Projects in case of natural unforeseen disasters for the stabilization period, whereas WUA will be responsible for carrying out regular operation and maintenance and resource collection in terms of ISF to meet the O&M expenditure.

Step 16: Result Framework and Monitoring: The result framework and monitoring of surface water schemes shall be conducted to verify the timely and satisfactory completion of the schemes. The responsibility for data collection and reporting will be

done by IDD/IDSD and WUA. Monitoring and Evaluation system shall comprise participatory methods leading to participatory monitoring and evaluation.

Assessment of the project

As per the project completion report of IWRMP the following conclusion can be drawn;

Program implementation management: Several times, programs and budgets were approved too late or towards the end of the fiscal year. Attention of the concerned authority needs to be drawn to this issue to ensure smooth implementation, especially of donor assisted projects. The mobile irrigation teams constituted in each of the regions lack clear cut responsibility and authority. Their main duty is to monitor the projects and report to the respective regional director after each and every field trip. Thus, the mobile teams are to be supported with adequate equipment, resources, and other logistics.

The monitoring teams constituted at the OPD further needs to be strengthened to monitor a large number of subprojects in three regions. The monitoring team at the region is required to be equipped with all resources, including human and necessary logistics. It is recommended that a proper mechanism of regular and periodic reporting to OPD through the regional team is to be established and activated. Direct feeding data to the centre from IDD/IDSD/GWBOs has reduced the feeling of responsibility among monitoring teams at the regions. To this end, sufficient resources need to be allocated within the cost estimate of ISP allowing IDD/IDSD/GWBOs to organize rapid monitoring surveys of the systems as per the monitoring requirement of the project.

Compliance of project implementation guidelines: Generally, implementation guidelines are observed but sometimes, very late. In some subprojects, guidelines are overlooked, for example, field mobilization of contractor is made before users' contribution of 30 percent of their share has been done. Moreover, the project appraised and supported two new ISPs, Ghatgaun ISP of Surkhet and Jugeni ISP of Dailekh, although the IWRMP was mandated to support the rehabilitation of FMIS only. Proxy participation by WUAs through VDC or MP's funds for contributions is found in a few subprojects. The WUA manages to get such funds to invest as their contribution. In fact, this type of activity creates non-involvement among the majority of the beneficiaries, which is unfavorable to the sector policy. This type of 'Dependency Syndrome' on the government assistance made WUA less accountable in the O&M of the system after its completion. In order to assure the sustainability of the project, it is recommended to guide WUA rationally in the generation of contribution which helps develop norms and rules for resource mobilization that works to sustain the project in

the long run. Considering the seriousness of issue of proxy participation, it is recommended that the OPD should commission a study to identify the various dimensions of the issues and develop strategy that ensures the transparency in farmer share of contribution.

Technical issues: The technical issues are largely attributed due to the results of existing practice of following model and reports of other completed subprojects. Because of copying the key component of one SP to another and cost estimate without detail investigation at the specific field, huge variation in quantity of civil work with number of key structures that are required for proper implementation is found to missing . In order to regulate the variation, the project should draft and enforce the guidelines to regulate the variation with specific conditions to be allowed and treated as natural in an unavoidable situation; however the variation of more than 15% of project cost should be disallowed. The practices of executing variations first and approving it on later stage should be treated as disqualifying the variation proposal all together.

The structures are to be designed considering the specific site conditions as well as the operation and maintenance capability of users. The structures constructed without detail examination of site conditions do not match the need of the users and are complex in operation. Similarly, the grade of the concrete in lining as well as the thickness of cover to the reinforcement should follow the standard code of practice applied in civil engineering.

To deal with the technical issues, it is recommended that each of the FSR should be verified with the help of TA and MIT at regional level. These components of the project at regional level are to be made more responsible by providing adequate resource, responsibility and guidelines that ensures the quality of design and implementation.

Due to the resources constraints in IDD/IDSD/GWBOs, these offices cannot retain one supervising technical staff at the project site until the construction work is completed. Though the WUA representatives are provided with the technical training to capacitate supervision works, it may not impart sufficient knowledge as required to control quality of civil work. In this connection, it is recommended to adopt some alternative mode of quality control like more intensive training to WUA, use of NGO/CBO staff as it was highly appreciated by the DOI staff during NISP implementation, could fulfill the institutional and resource constraint gap and enhance the effectiveness of IDD/IDSD/GWBOs in overall project implementation.

Adherence to time period and schedule of construction activities: Different factors such as low bidding, late payment, disturbance, absence of supervisory staff, general

strike, etc. hinder the compliance with the schedule presented at the time of agreement. Sometimes negligence on the part of the contractor or entrusted body to carry out construction work has also hindered compliance with the schedule. In general, almost all subprojects are behind the agreed schedule of construction.

Trainings and capacity support: It was observed that inland trainings are conducted but these were largely towards the end of the project period. IWRMP has started to identify the specific training needs of WUA at the particular stages of project development and incorporate them into comprehensive institutional development plan with clear implementation timelines. The effort needs to be expanded in all completed SPs. Further, skills and aptitudes could be enhanced through demonstration and visits to the subprojects which are role models in the group operation and participatory matters. Therefore, it is recommended to identify the model social organization and organize exposure visits to exchange the ideas and the procedures.

MOU signing process and its implications: Transparency among DOI, WUAs and beneficiaries are the key factors in the sustainability of the system. Discussion with the WUAs and other beneficiary farmers revealed that the practice of signing the MoU at user farmers' meeting was realized to be more useful, as it enabled all farmers to understand their responsibilities in regard to the SP implementation and establish a better relationship between IDDs and WUAs. Therefore, it is recommended to spend more time in drafting of the MoU and should be discussed thoroughly at a community mass meeting and ratified by the general assembly before signing.

Feasibility study and system design follows the technical part only: In addition to the technical resource involved, project feasibility study reports must be the result of close collaboration among IDD/IDSD/GWBOs, WUA, DOA and other district level stakeholders. All field investigations must be undertaken as a team approach with social mobilization and agricultural inputs from appropriately skilled actors. Similarly, the detailed survey and design as well as the, project cost sharing should be worked out with the active participation of WUA. It is recommended that the quality of consultation between WUA and IDD/IDSD/GWBOs be further improved in terms of frequency of consultations ensuring the meaningful participation involving majority of user during the consultation process. This approach must also be used right from the subproject inception and throughout the project cycle.

IDD/IDSD/GWBOs institutional capacity to conduct social investigation: In IWRMP, the feasibility studies of the prioritized subprojects were conducted by both the IDD/IDSD/GWBOs staff and private consulting firms. It was noted during the field visit that concerned staff, generally engineers, were responsible for preparing the feasibility

study reports including the social, institutional, agricultural and economic aspects. The review of the SEMP showed enough space to improve the quality of reports, particularly the social investigation. In order to improve the quality, it is recommended to constitute a multi-disciplinary team for the purpose of subproject design in the future and the survey report should be made a basis for evaluating the social status of the subprojects and also to understand the poverty situation at the subproject level in order to facilitate decision makers selecting genuine subprojects, focusing on the poverty situation as a priority.

Likewise, the orientation and skill required to prepare the SEMP need to be imparted to the concerned persons through the regular and periodic refresher training. To this end, seeking the service of private sector could be an effective solution to scale-up the capacity of DOI to undertake the social investigation.

Commissioning test and its implications on sustainability: The lack of joint inspection made WUAs feel that their sub-project has not been finished. And IDD/IDSD/GWBOs did not listen to them once the contract works were done. The sustainability of the improved/constructed irrigation system is only assured if defective structures found before commissioning are rectified. More often the potential command area could not be irrigated fully thereby creating conflicts among farmers who have contributed to the development of their systems but could not get enough water. In this connection, it is recommended that IDD/IDSD/GWBOs should give due importance to organize a joint inspection and test run to all completed subprojects, list out the defective work if any, and be rectified by the contractors.

O&M support to WUA: The O&M training is one of the most important trainings as it imparts knowledge on how to operate and maintain the constructed/improved infrastructures. It is recommended that the current practices of providing the O&M training through inserting a separate session in all ongoing training programs need to be up-scaled by organizing intensive O&M training once the newly developed infrastructures become operational in each of the completed subproject. Similarly, adequate support of DOI in system O&M and water management is to be improved. In addition to the training to WUA members in system O&M, it is recommended that the canal operation and maintenance plan should be prepared in consultation with the WUA and necessary technical assistance to implement the plan should be provided to them. Additionally, regular feedback and in-house monitoring mechanism within the WUA should be established and periodic monitoring by respective IDD/IDSD/GWBOs to feed information into MIS system established at DOI.

Unification of various farmers groups constituted by various institutions: Various institutions such as DOA, Department of Livestock, Department of Forest and similar service providers, both Government and non-governmental organizations, have created farmers groups to serve the purpose of the respective organizations. For example, the Department of Agriculture doesn't recognize the WUA and forms separate groups to execute its extension activities. Even under the IWRMP, where the budget was allocated in the project for agriculture development, the extension activities were carried out through farmer groups rather than the WUA. Such policy forced the WUA to be confined to only water related activities. Agricultural inputs such as fertilizers, seeds, access to credits and market, production technologies and equipment are generally not provided to farming communities in time. The role of the WUA needs to be expanded to address the issues of irrigated agriculture. Furthermore, it is time to think about the amalgamation of various farmers groups constituted by various institutions, framing broader criteria to accommodate all farmers' groups in one for the effective participation and sustainability of social institution. The criteria could be the hydrological boundary where the size can be decided by interaction among probable members.

CHAPTER 4: ANALYSIS

Integrity Defined

Integrity is synonymous with honesty and refers to the need for public, private and civil society sector representatives to be honest in carrying out their functions and resist corruption. It requires that holders of public or private office do not place themselves under any financial or other obligation to individuals or organizations that may influence their ability to perform their duties. This is about the need for public, private and civil society sector representatives to be honest in carrying out their functions and to resist extortion and banish corruption. Holders of public or private office should not place themselves under any financial or other obligation to individuals or organizations that may influence their ability to perform their duties.

How integrity aspects have been addressed and integrated in Irrigation development processes are analyzed through these three integrity parameters lens.

Transparency refers to the right of citizens to access relevant information. Openness and public access to information are vital, so that water-users can understand the decision-making processes that affect them. This makes citizens knowledgeable about the standards to expect from public officials and enables them to protect their rights.

Accountability is a broad concept and it entails several dimensions and is often used in different ways. Some see it as a mechanism to hold people and institutions accountable, whereas others see it as a concept referring to the actual application and implementation of rules and standards. Accountability, in a democratic sense, means an individual in a public position must be accountable for his actions may it be behavioral, administrative or financial deeds.

Participation is a term which refers to basics of democratic governance that whoever is affected by a decision should directly or indirectly, have the chance of intervene and influence such decisions. It is argued that participation fosters ownership in the sense that decisions are increasingly accepted and implemented by the involved actors.

Corruption, according to Transparency International, is “the abuse of entrusted power for private gain.” Corruption is about breaking socially established expectations of appropriate behavior, and this is why a cultural approach is so important. Corruption is an exchange of either economic or social resources. Corruption does not only take place in the public sector, it also occurs in non-governmental organizations and private enterprises.

Bribes and kickbacks is one of most cited forms of corruption. This may include the payment of a fixed sum, a percentage of a contract or in-kind favors. It is given to unduly influence some action or decision on the part of the recipient or beneficiary. This can equally occur at higher levels within the chain of service provision.

Collusion/complicity is an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party. The most common form of collusion is an arrangement of a cartel of bidders to win an over bidden public contract and determine the winning bidder . This may or may not involve paying bribes to government officials so that they turn a blind eye to the practice.

Fraud is an action of manipulation or distortion of information for private gain including the falsification of receipts and other documents.

Favoritism, clientele-ism, cronyism and nepotism is to misuse of entrusted power to provide preferential treatment to friends, family, business partners, political parties etc. This form of corruption often goes beyond individual interest and may include attempts to realign power structures for the accumulation and maintenance of power, status and wealth.

Extortion is coercion to force an action or induce complicity. It can include threats of violence or of exposing damaging information in order to induce cooperation.

Embezzlement and theft means the direct taking of money or property for personal enrichment out of public property. It might involve even diversion of public funds to one's own bank account.

Integrity aspects of Irrigation sector

Unlike other developmental projects, irrigation development projects have a complicated process and are time consuming. An irrigation project has to pass through a number of stages-starting from identification, pre-feasibility, environment impact assessment, detailed feasibility study, financing, designing, construction, and operation, including clearances from government. As per the prevailing irrigation development related laws, an irrigation project has to pass through many steps to get it implemented and various agencies are involved in the process. If everything goes fine, a small size irrigation project may complete in a year, but a large project takes several years to complete.

An analysis has been done to find out to what extent integrity aspects have been safe guarded in those steps and what are the potential integrity risks at major stages of irrigation development.

1. **Integrity Risk Area: Project Selection/Identification**

It is the first step of development of any irrigation project. Government carries out some independent pre-feasibility and feasibility studies of large irrigation projects on its own or through foreign assistance. Based on Master Plan and feasibility study reports, government selects irrigation projects to be undertaken by the government. By and large, it is the government agencies who select the project through its well established arrangement. Beneficiary has little say in the selection of the projects. In fact, people who have access to political power are, influential in getting a particular project selected. As a result, most optimum irrigation projects are often overlooked or not developed.

Government has prepared Master Plans of major rivers and basins. A number of potential irrigation projects were identified under these Master Plans. These Master Plans have covered large size irrigation projects to be implemented from large rivers only. They do not cover many small/medium size projects. There is a need of a comprehensive Master Plan for water resources projects including irrigation projects.

Integrity Risks

Irrigation projects to be developed by the MoIrr/DoIrr have been selected in a haphazard way. The process of selection of projects is not transparent. There has been undue political interests, and sometimes donor's interest (if it is a donor funded project) and influence in selecting many projects.

2. **Integrity Risk Area : Planning/ Study/Investigation**

Government has carried out Master Plans of some large rivers and river basins. The DoIrr has conducted pre-feasibility and feasibility studies of many irrigation projects on its own or through bilateral or multilateral support. In recent years, the government of Nepal, in its annual budget, allocates significant budgetary amount for conducting feasibility studies of large Irrigation projects and inter-basing transfer irrigation projects.

The Environment Protection Act (1997) and Environment Protection Rules (1997) requires an Initial Environmental Examination (IEE) report depending upon various criteria. A public hearing is mandatory for projects requiring EIA by EPA 1997 and EPR1997 and is a forum for interested and affected communities to obtain and

exchange adequate and accurate project information. This provides the public an opportunity to examine relevant project information and make their concerns, opinions and suggestions known to the proponents and other concerned authorities.

Integrity Risks

The DoIrr carries out feasibility studies through its own staff or outside consultants following standard procurement processes of the government. If the feasibility study is sponsored by bi-lateral donor, there is limited competition among consultants and there are conditions of the donor. Sometimes, there are complaints that the DoIrr has not selected a consultant through fair means, i.e. without properly following procurement laws.

There are no standard formats for feasibility studies. These reports could be sometimes biased to make the project feasible. There are possibilities of manipulating hydrological data and changing site of the project in order to make the project feasible. For most of the smaller schemes, only Initial Environment Examination (IEE) is required; Irrigation projects even smaller in size may have substantial impact on the environment and people living in downstream; especially when there are many projects in one river. Minimum environmental flow is necessary to be maintained, as water is diverted to irrigate lands in many places, and hence requires detailed cumulative EIA .

Both IEE and EIA reports of irrigation projects could get manipulated; actual impact of the project and the impact on the environment is not properly assessed. Although EPR requires conducting a public hearing during the preparation of an EIA report, EPR 1997 does not specify the number, location, timing or the process. Due to this, there is a chance to manipulate public hearing process and there could be less opportunity for people to raise their concerns and voices.

The structures of the projects generally lie in remote places and in the areas of forests or protected areas. In such case, there is a need to get clearance from the Ministry of Forests and Soil Conservation which is cumbersome and time taking. Hence at times, it becomes necessary to use political influence or other undue means to get clearance. Similar may be the case with the Ministry of Science, Technology and Environment whose final clearance is mandatory on Environmental studies.

3. **Integrity Risk Area : Funding (bilateral/multilateral funding)**

The fund to be required for the project is apportioned in the country's budget, there may be entirely government financing or government may receive grants or concessional loans from donors. Irrigation projects by their nature are very expensive. It is therefore impossible to finance all the projects from government's internal resources. At times, it

is necessary to carry out a project with assistance from bilateral or multilateral financial institutions. .

Integrity Risks:

There has been unhealthy competition among banks and financial institutions in financing the irrigation projects (Is irrigation project financed by private banks?). Bi-lateral donors tend to have preference for type and location of the project depending upon various factors such as religion of the beneficiaries; geographical location of the project area. Sometimes, donors want to influence the government and submit lofty proposals to the government authorities and cite inability of local private and public entities to finance a particular irrigation project.

4. **Integrity Risk Area : Design of the project**

One of the most important steps of the irrigation project is designing of the project. Middle scale and small irrigation projects are designed by DoIrr's engineers. In large projects, combined effort is put by DoIrr and Consultants to design as per the complexity of structures. Project like Sikta is designed by DoIrr engineers however headwork's gate design and electromechanical part is outsourced, Rani Jamara Kulariya's intake and head reach is outsourced and designed by consultant's engineers. Thus, there are situations, where the government has to depend on foreign assistance for designing of the projects. At times, large irrigation projects have been designed by the foreign consultants and in such case, they might consider their vested interest of selling their technologies and products.

Integrity Risks

There are risks of over-designing or under-designing of the irrigation projects in the case of government developed projects. The projects designed with foreign assistance are costliest as huge amount of money is spent to hire services of foreign consultants. If the government receives financial support from donors, in that case ,donors have upper hand in selecting the consultant and he is accountable to the donors than to the national project manager. The consultant may work to serve the interests of the donors rather than the interests of the recipient government.

5. **Integrity Risk Area : Construction**

It is another most important step of irrigation project. DoIrr who is responsible for the majority of the construction projects, usually awards the construction job to the contractor selecting from competitive bidding following procurement laws of the Government.

Integrity Risks

One of the problems of irrigation projects in Nepal is that they are not completed in time resulting cost-overrun and time over-run. There have been questions, doubts and controversies in the construction of a projects developed by DoIrr. In such project, there are risks of substandard works and unwarranted contract variations, false claims, corruption in land acquisition. If it is a donor funded project, there may be provisions restricting competitive bidding and construction materials to be compulsorily imported from the donor country. There may not be fair practice of procurement.

6. Integrity Risk Area: Operations

Medium and large irrigation projects are maintained and operated by the DoIrr. As the project comes into operation, it has to procure materials and equipment amounting millions of rupees and acquire necessary manpower. The number of project staff necessary for the project operation maintenance is determined by DoIrr and then staffs are deployed normally as per the approved positions. Procurement laws and guidelines are practiced for procuring materials and equipment and acquiring services.

Integrity Risks:

There is political influence in the appointment of the project manager to the project in order to get undue benefits from the project. There is weak project management. The project manager is given limited authority. The decision making is slow; as a result, it has to bear huge amount of money to contractors as compensation for not meeting contractual obligations. There are no valid reasons why project managers have been changed so frequently. There are chances of collusion with suppliers for supply of materials and equipment.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

Corruption is a big problem in the water sector. It puts the lives and livelihoods of billions of people at risks and slows development and poverty reduction.

When public power is abused, the costs can be high. Project prices rise, farms and poor villages may not get the water they need and safety features on large projects like dams get a low priority.

Irrigation, weir/dams, water and related projects involve consulting, civil works and several levels of supply contracts. Integrity is a core element of good water governance. There is no sustainability without integrity. The initiatives that produced visible benefits in communities and countries sometimes face strong resistance. Participation of informed stakeholders and a strong civil society were identified as key driving forces for change towards better integrity.

Water will determine what world the future generations will live in. Water is essential for people, food security, energy, environment, and for social and economic development. It underpins progress in health, equity, gender equality, well-being and economic progress in developing countries but also in the world's most developed countries. But this precious resource is underpinned by bad governance and lack of integrity. Future generation will have continued access to water only if water is used today, in a sustainable and waste-less way; for example, 90% of Bagmati river water is tapped for drinking purpose from source during dry season consequently the river is almost dead in downstream during that period.

Improving governance will ensure that there is a sustainable and equitable use of water, and causes better crop yield. In most situations, shortcomings are not due to shortage of water resources but due to governance failures, such as institutional fragmentation, lack of coordinated decision-making, corruption and low levels of transparency and accountability. The result is that governance systems are often not able to prevent or even provide incentives for unethical behavior and poor professional practice. Corruption is moreover all pervasive and affects all aspects of the water sector – from water resources management to drinking water services, irrigation and hydropower, it occurs in all phases – from design through construction to operation and maintenance – and it is a major factor in the global water crisis. Integrity issues are often at the core of conflicts around water, which are arising at local, country and international levels.

Improving water and irrigation governance requires improving integrity where specifically strengthening the aspects of transparency, accountability, and participation (TAP) is crucial. Massive investments and aid flowing into the water sector makes it

highly vulnerable to corruption. Estimates by the World Bank suggest that 20–40 percent of water sector finances are being lost to dishonest practices. Corruption comes in many different forms and the scope varies across water practices, governance structures and the perceptions and norms of actors involved. Typical examples of corruption include distorted site selection of projects, collusion and favoritism in public procurement, and nepotism in the allocation of public posts. In the water sector, it is believed that 20 per cent to 70 per cent of resources could be saved if transparency was maintained and corruption eliminated. The significant negative impacts of corruption on economic performance, growth and human development are treated as a tenet and control of corruption a core indicator for good governance.

Improving water governance requires transparency, accountability and fighting corruption. It requires the right knowledge, access to strong partners and good tools. Today many governments, private companies, NGOs and the general public are increasingly aware of the relevance of water integrity. It is important to understand what the corruption risks are in different contexts by doing proper diagnosis and assessment studies to identify priorities and needs before taking action.

Improving water integrity means working with preventive measures to promote transparency, accountability and participation in water. Some preventive measures include; strengthening procurement systems, consumer redress and influence, increasing accountability and transparency in water planning, public expenditure tracking, strengthening capacities and awareness among water managers, regulators, and decision-makers. It is critical to promote evidence based water integrity measures by bringing knowledge and experience together, as well as innovative methods to fight corruption.

The government of Nepal has brought out various policy measures to promote irrigation to cultivated area.

Irrigation development projects are marred with time overrun, cost overrun, indecision, corruption and conflicts at both local and national levels. A number of integrity risks do prevail in Irrigation development projects, which need to be addressed to promote integrity in Irrigation development.

This study recommends the following potential interventions to mitigate integrity risks in irrigation development:

1. **Policy making / Project approval stage**

Integrity Risk area

- Political influence
- Misplaced priority

- Donors and financing institutions' vested interest
- Nepotism
- Non-transparent

Recommended intervention measures

- The optimal and sustainable use of water resources including irrigation must be the assessment through Master Plans taking into considerations of Integrated Water Resource management. And, such Master Plan shall be the basis for the project selection.
- Government should set the priority according to Master Plans.
- Master Plans should be updated. The optimal and sustainable use of water resources based on Integrated Water Resources Management must be assessed and projects shall be identified and prioritized accordingly.

2. Project Study and stage

Integrity Risk area

- Biased or inadequate study
- Lack of standard norms
- Political influence
- Kick-backs
- Manipulation of hydrological data, unrealistic IEE and EIA report,

Recommended intervention measures

- EIA should be made mandatory for irrigation projects
- Standard norms should be formed for feasibility studies
- Effective enforcement of provisions of procurement laws
- Competitive bidding even in donor supported projects

3. Planning & budgeting

Integrity Risk area

- Distortions in decision on locations, priorities
- Diversion of funds
- Falsification of budget
- Bribe to influence fund allocation
- Denied access to project plan, budget amount

Recommended intervention measures

- Project implemented as per the periodic plan
- Transparent budget allocation procedure
- Resist unnecessary pressure for undue allotment of the resources

4. Funding

Integrity Risk area

- Collusion of developers with financial institutions,
- Unhealthy competition among banks and financial institutions
- Cost manipulation

Recommended intervention measures

- A definite arrangement should be made in the Act for community participation.
- Taking tied-loans or grants to be stopped
- In irrigation projects, service road is included in project cost. However, cost of access roads and other ancillary works should not be considered in the project cost analysis.

5. Designing stage

Integrity Risk area

- Overdesigning or under designing
- Collusion in selecting consultant
- Limited competition in bidding

Recommended intervention measures

- Capacity of national consultants should be developed.
- Stop taking tied- loans or grants
- Proper Vetting of design work
- Effective enforcement of procurement laws

6. Tendering & procurement

Integrity Risk area

- Cover up, collusion, favoritism in procurement processes
- Kickbacks to influence or secure contracts

- Collusion for inferior material supply
- Distorted information shared about bidding process

Recommended intervention measures

- Effective enforcement of procurement laws
- Transparent tendering process
- Proper vigilance mechanism
- Involvement of stakeholders in tender awarding process

7. Construction stage

Integrity Risk area

- Collusion in selecting contractor
- Sub-standard work
- Construction work variation
- Cost overrun
- Time overrun
- Approve poor quality construction
- Not building to specifications
- False invoicing
- Underpayment of labor
- Corruption in community based construction projects

Recommended intervention measures

- Effective enforcement of procurement laws
- Effective mechanism to monitor construction work variation
- Maximum Construction variation percentage to be fixed
- Heavy penalty for not meeting project deadline
- Actions against officials for not making timely decisions

8. Operation and maintenance stage

Integrity Risk area

- Poor project management
- Frequent change of Project Manager and limited power to project manager
- Overstaffing
- Undue political influence
- Decision making centralized and cumbersome
- Ignoring Operation & Maintenance (O&M)

- False documents to show O&M undertaken
- Bribe for services

Recommended intervention measures

- Effective project management
- Project manager should be given adequate authority to make decisions
- Staff requirement should be determined by O& M study and strictly adherence to it.
- Mechanism should be developed to make officials accountable and responsible.

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