

Drinking Water and Sanitation

1. Background

Poverty alleviation is the overriding objective of development efforts in Nepal. The Tenth Plan (2002~2007) document of His Majesty's Government has renewed its commitment towards this objective. Equitable access to social and economic infrastructure for the poor and marginalized groups is regarded as one of the four pillars towards achieving this overriding objective alleviation. The government has acknowledged that development of water supply and sanitation is an important link towards achieving this social equity. It has been realized that the provision of water supply services in rural areas results into benefits relating to:

- (i) improvement in the living conditions, especially those of women, by reducing the drudgery in collecting water,
- (ii) positive contribution in lessening morbidity and child mortality cases,
- (iii) supplement of family nutrition by encouraging kitchen gardening and improved livestock farming,
- (iv) increment of family income by lessening medical expenditures and reducing sick-days,
- (v) improvement of educational environment as children are healthier and have more time to attend to studies, and
- (vi) improvement of organizational skills of communities to undertake other development programs.

It is, however, also realized that in the absence of integrated sanitation and carefully targeted awareness building programs, only a portion of the intended benefits actually occur.

Periodic plans and policy documents of the government have therefore advocated for improving the access to safe water supply and sanitation facilities in order to improve the quality of life and productivity, especially in rural areas, which will ultimately lead to poverty reduction. Due to the high emphasis placed by the government for provision of these services, the population with access to potable water supply services in Nepal grew from a mere 37% in 1990 to over 71% in 2002. The sector has received a well deserved priority from both the governmental and non-governmental sector and several international funding/aid agencies have supported this endeavor.

The National Water Supply Sector Policy promulgated by the government in 1998 has defined the following principal objectives for water supply and sanitation programs:

- ?? To provide safe, convenient and adequate water supply with sanitation as an integral component to all the Nepalese population,
- ?? To reduce the incidence of water related diseases, and
- ?? To lessen sufferings of women and children to collect and carry water.

Implementation of demand responsive programs and intensive participation by targeted community during the phases of program identification, design and development, implementation and operation and maintenance have been adopted as the key strategies to achieve sustainable development by both the governmental and non governmental agencies in implementation of rural water supply and sanitation programs in Nepal.

Despite this high impetus provided to the development of the sector, about one quarter of the national population still lacks access to safe water supply and nearly three quarter of the population lacks access to safe sanitation facilities. The government, in this context, has declared its commitment to provide basic water supply facilities to all its population and provide basic sanitation facilities to 50 percent of the population by the Twelfth Plan period (2012~2017). As substantially large amount of resources are required to achieve this target, the government solicits support of development partners towards achieving this goal.

2 Present Status

2.1 Physical Development

Basic water supply facilities are currently available to about 71% of the national population and basic sanitation facilities, defined as access to safe excreta disposal facility, are currently available to 25% of the national population. The relative distribution of facilities by development regions is however skewed with relatively lesser coverage in the east and the central regions as shown in Table 1:

**Table 1:
Region-wise Distribution of Population Coverage**

Sr.	Development Region	Population of the region (thousands)	Benefiting Population (thousands)	
			Nos.	% of total population
1	East	4789.5	2917.4	60.91
2	Central	6546.5	4251.3	64.94
3	Western	4091.3	3216	78.60
4	Midwest	2851.0	2284.4	80.12
5	Farwest	2007.2	1719.2	85.64
	All regions	20285.5	14388.3	70.90

The higher coverage in the relatively less developed regions, the mid west and the far west, is a result of continuous support by the Asian Development Bank loans and financial support from other donors in these regions in the sector since 1984.

The coverage figures, in terms of served population, may be on the higher side as it does not take into account the operational status of constructed facilities. The District Water Supply and Sanitation Profiles (DWSSP) prepared by the Department of Water Supply and Sewerage has indicated that approximately 10 percent of the constructed systems require major rehabilitation and about 50 percent of the systems require major repair, which implies that substantial intervention and resource allotment is required to upkeep the number of served population through these systems.

On the rural/ urban balance the present coverage on water supply and sanitation is as shown in Table 2:

**Table 2
Rural / Urban Distribution of Coverage in Water Supply and Sanitation**

Sr.	Region	Benefiting Population (% of total population)	
		Water Supply	Sanitation
1	Rural	70.9	20
2	Urban	76	53

2.2 Progress made during the Ninth Plan Period (1997~2002)

The Ninth Plan document set a target of providing basic water supply facilities to 100% and basic sanitation facilities to 50% of the national population by the end of the plan period (1997~2002). This required expansion of water supply facilities to approximately additional 9,700,000 people and sanitation facilities to approximately 5,258,000 people. Compared to the target, the progress was 29.94% (2,904,000 people) in the water supply sector and 28.34% (1,490,000 people) in the sanitation sector. Although the Ninth Plan period progress fell

substantially short of the target, commendable progress was made in the sustainable delivery of services by undertaking programs that were largely based on participatory approaches. Efforts were also made during the period in sensitizing the communities towards effective water use and safe sanitation practices through a wide range of management, community awareness and sanitation related training activities, which were conducted as an integral part of the water supply and sanitation development programs. These activities effectively contributed towards capacity building of the local communities to better plan, implement and operate these services. Evaluation of the Ninth Plan has identified the following problems and challenges for the sector development:

- ?? Coordination between different agencies in the sector has not been effective due to lack of efficient decentralization of decision-making powers to the local communities and organizations. Duplication in flow of resources occurs as a result of lack of coordination between different governmental, non governmental and private organizations active in the sector.
- ?? A number of systems constructed in the past are either not functioning or are only partially delivering the intended services in the absence of proper maintenance of these systems. Local communities are unwilling to accept the ownership for operation and maintenance of a number of systems developed in the past, which were implemented without meaningful community involvement
- ?? It is difficult to assess the actual requirement for extension of facilities required to be undertaken in future as a holistic Water Supply and Sanitation Development Plan has not been prepared for all the districts. It is customary to include only the resources channeled through the government window in preparing the district level programs. A coordinated effort for development by accounting flow of resources from both the governmental and non-governmental sector has not been possible.
- ?? Parallel undertaking of a large number of projects has resulted in scattering of the limited resources and as a result some programs take more than ten years to get completed. The Ninth Plan period target could not be realized as required resources were not available in tandem with the target.
- ?? Many urban systems are being subsidized for operations. It has been difficult to attract the private sector for operation of these systems as the system operations are not based on cost recovery principles.
- ?? National statistics on water supply and sanitation coverage have not been updated. This has adversely effected the planning process for improvement programs and it is difficult to get a reasonably accurate understanding of the actual situation.
- ?? Monitoring and Evaluation of water supply and sanitation development activities is not effective.
- ?? Although programs like adult literacy, health education and income generation for women can substantially impact the success of sanitation programs, effective coordination with such related agencies is not happening.

3 Sector Approach and Policy Reforms

3.1 Sector Approach

The Millennium Development Goal as defined by the Johannesburg Summit is targeted towards substantial improvement in access to the water supply and sanitation services, such as that the population without access to safe water supply and sanitation are reduced by half by the end of 2015. In order to support this objective, the government has targeted to provide basic levels of water supply and sanitation services to the entire population by the Twelfth Plan Period (2012–2017). A policy reform to support this goal has been undertaken, which lays emphasis on demand responsive approach. Sustainability of services is a major concern, which is targeted to be achieved through increased role of local planning bodies like DDCs

and VDCs in the planning process, active participation and decision making by benefiting community, cost recovery of operation and maintenance expenses, mainstreaming women and disadvantaged groups for benefit sharing as well as for decision making, integration of hygiene education and sanitation facilities in water systems development, etc. The sector will be developed through active participation by communities where community organizations and NGOs will play an instrumental role in providing required external support as program facilitators and local agencies like DDCs and VDCs will provide the planning and monitoring inputs. The redefined role of the governmental agencies to act as agencies responsible for regulation, monitoring and technical support will be strongly translated into action. DWSS organization will be restructured and adapted with required skills mix to undertake the role of the lead agency responsible for database management, training, sectoral research, provision of technical inputs, regulation of services, etc. by 2012. Schemes benefiting population less than 1000 will be implemented by local agencies through the support of Ministry of Local Development with immediate effect.

Besides extensive efforts for expansion of basic levels of service, there is also a need to improve the quality of services in terms of water quality, continuity and reliability. The disparity in levels of service between larger urban centers, smaller towns and rural areas has to be gradually bridged. The approach to betterment of service levels across the urban and rural areas by gradually upgrading the levels of service will also receive a priority. A twenty year vision has been developed in this regard.

3.2 Twenty Year Vision (1997-2017)

The National Water Supply and Sanitation Policy has adopted a two pronged approach for the development of the sector with paramount emphasis on sustainability of services with a 20-year vision, which are: (i) to achieve additional coverage for population without access to water supply and sanitation, and (ii) to improve the levels of service for population already availing these services.

Accordingly, the following long term targets have been set:

Table 3
Categorization of targeted services on a long term perspective

Sr	Year	Water Supply Facilities (% of benefiting population)			Basic Sanitation (% of national population)
		Basic	Medium	High	
1	2007	60	30	10	50
2	2012	40	45	15	80
3	2017	15	60	25	100

The categorization of services for water supply has been based on five parameters which comprise the quantity, quality, accessibility, reliability and continuity of water supply available to the consumers, which have been defined as shown in Table 4.

Table 4
Basis of Categorization of Services

Sr	Parameter	Service Level Category		
		High	Medium	Basic
1	Quantity (lpcd)	112-150	65	20-45
2	Quality	WHO Guidelines	National Standards	Potable
3	Accessibility	Fully plumbed house connection	Yard Connection (within premises)	Stand post (within 20 min. walking distance)
4	Duration of Supply (hrs/day)	24	24	4
5	Continuity (months/year)	12	12	12

Contrary to the concern that categorization of services focuses largely towards urban services, the commitment to gradual upgrading with better quality of service to 60% of the national population by 2012 and 85% of the population by 2017 will help to bridge the inequalities in service levels between large urban centers and small towns and rural areas.

3.3 Policy and Institutional Reforms to Support the Sector Approach

It was strongly realized in the sector that policy reforms and inter-sector coordination between different agencies were issues of paramount importance to achieve the long term objectives and to address the shortcomings and challenges identified by the evaluation of the Ninth Plan (2002~2007) efforts. Accordingly, the National Water Supply & Sanitation Sector Policy 1998 has been recently revised and updated, after a larger consultation between governmental and non-governmental agencies in January 2004. The revised document carries a sharper focus on the rural water supply and sanitation sub-sector and a separate policy guideline for the urban sub-sector is currently under preparation. The revised policy document also includes a five-year action plan for implementation. The major strategy steps outlined in the revised policy document include:

☞ Decentralized approach of development by appropriately recognizing the roles and responsibilities of the local governments and beneficiary community organizations in planning, implementation and upkeep of the water supply and sanitation (WSS) services and delineation and redefinition of the role of the water sector organizations as facilitating agencies.

☞ Due recognition on the need to have a sound financial management for the sector development to be achieved through an effective cost sharing mechanism to ensure efficacy and sustainability of programs. Promoting capacity building of local institutions and people enabling them to take appropriate decisions.

A sound financial management for the long-term sustainability of the developed system and thus sharing capital cost has been appropriately recognized. The need to capacitate the local institutions, to enable them to take up appropriate decisions in time, has been recognized and is being promoted.

The changes in water supply and sanitation sector policy have been brought about recently to make the WSS program effective and output oriented. The community-based approach adopted in recent years for the implementation of rural water supply schemes, which has proved to be sustainable and effective, will be further strengthened.

The policy reform has been enacted in close consultation with all stakeholder organizations representing government, semi-government, non-government, donor agencies and community members. The new policy is therefore widely accepted and attempts to provide a common platform for modalities of implementation. Adoption of demand responsive and need based approach, provision of one year of Pre- development phase in project design and implementation to adequately prepare the communities for implementation, standardization of community contribution to 20% of the project cost estimates, etc. are some of the commonalities that will be followed. This is expected to minimize confusions related to implementation modalities and is expected to support the much awaited inter-sector coordination.

The PERC recommendation to involve communities in rural schemes right from the planning stage and to generate up-front cash contributions from the communities as a part of the capital cost sharing mechanism has been well accepted in the policy revision. The role of user communities, as an implementer, will be further strengthened in planning, design, physical construction and operation and maintenance of the systems. This strategy is put in action to develop a sense of ownership in the community, which can go a long way in ensuring the long-term sustainability of the projects. This is also expected to ensure greater transparency and accountability in management of funds.

The policy of capacitating the communities to assume responsibility of operation and of maintenance of water supply and sanitation projects is expected to contribute to sustainability of the constructed facilities. This shift of responsibility will also allow the government agencies to have more meaningful participation in activities related to monitoring, evaluation, local capacity building, providing technical assistance, regulation of services, standardization and service improvements.

A Monitoring and Evaluation Unit for monitoring sector agencies, their performance and effectiveness of the programs has been recently established at the Ministry of Physical Planning and Works. The unit will be headed by a Joint Secretary of the Ministry. The unit is in the process of developing performance indicators for the purposes of evaluation. At the implementation level DDCs and VDCs will be strengthened to undertake effectiveness and efficiency in program monitoring.

A sector account has been recently established to allow prudent, pragmatic and coordinated fund flow in the sector. The account will be maintained by the Ministry of Finance and will be monitored by the Ministry of Physical Planning and Works. The opening of sector account will allow competitiveness amongst several sectoral agencies to perform better as more funds will be diverted to agencies showing better and promising performance. The monitoring of the performance of sector agencies will be carried out by the Monitoring and Evaluation Unit for Rural Water Supply and Sanitation on the basis of pre-determined performance based indicators.

4 Tenth Five Year Plan (2002-2007)

The Tenth Five Year Plan (2002~2007) document has been prepared in line with the long term vision adopted for the sector and it draws upon the lessons learned from the implementation of the Ninth Five Year Plan programs.

4.1 Objectives

The Tenth Five Year Plan document of HMGN has acknowledged that the provision of safe water supply and sanitation services contributes towards poverty reduction by improving productivity as it has direct linkages to human development indicators like longevity, child mortality and morbidity and better health conditions. The provision of these services provides opportunities to women to engage in income related activities and provides better environment for education, especially to girl children, by reducing their drudgeries of collecting water. It also contributes towards improving gender equality and women literacy. Following are the sector objectives defined by the Tenth Five Year Plan document:

- ?? Provide 85 percent of the national population with basic levels of water supply services by the end of the plan period with gradual improvement in service levels.
- ?? Provide appropriate sanitation services in rural and urban areas through community awareness programs
- ?? Help to reduce infant mortality by bringing about a reduction in water related diseases and contribute towards income generation by preventing loss of human time.
- ?? Involve private enterprises for effective management of urban water supply services and improve standards and levels of such services.

Accordingly, the following quantified targets have been set:

- ?? Provide basic water supply services to additional 4,591,000 people.
- ?? Upgrade the levels of service to provide high level of service to 1,334,000 and medium level of service to 4,591,000 people.
- ?? Provide sanitation services to 7,421,000 people within the plan period through awareness raising activities related education, advocacy and training programs.

The Tenth Plan document has also provided indicators for monitoring the effectiveness of the programs, which are as follows:

- ?? number of annually completed projects and benefiting population
- ?? cost effectiveness
- ?? level of community contribution in programs
- ?? saving of time in collecting water
- ?? services to the disadvantaged and poor
- ?? indicators related to women participation, especially in Water User Committees and health and sanitation
- ?? reduction of diarrhea in children below five years of age
- ?? sustained use of toilet facilities.

Table 5 shows the matrix of objectives, activities and outputs as defined in tandem with the above target for the Tenth Plan period (2002~2007):

Table 5
Tenth Plan Period/ Medium Term Objectives, Activities and Outputs

<i>Objective</i>	<i>Activity</i>	<i>Output</i>
<u><i>Objective 1</i></u> <i>To increase coverage by basic water supply services</i>	a) Drinking Water supply projects b) Rainwater Harvesting c) Community Water Supply project d) Sewerage Construction e) UNICEF Supported Programs	?? Provides basic water supply facilities to 3,850,000 additional rural population.
<u><i>Objective 2</i></u> <i>To increase population served by basic sanitation facilities</i>	1. Environmental Sanitation Program 2. Water Quality Improvement Program 3. National MIS Development Program 4. HRD Program 5. Decentralized Action for Women and Children (DACAW) Program f) Rural Water Supply Project (WR) g) Rural Water Supply and Sanitation Fund Development Board Project (RWSSFDB)	?? Provides basic sanitation facilities to 5,613,000 additional rural population
<u><i>Objective 3</i></u> <i>To upgrade water supply service to provide high service level and medium service level to additional populations.</i>	a) Drinking Water Quality Maintenance Project b) Small Town Water Supply and Sanitation Project c) Mangarh Drinking Water Project d) Deep Tube well and Metering Project	?? High level of service provided to 603000 additional population. ?? Medium level of service provided to 1,130,000 additional population. ?? Arsenic Mitigation Programme and water treatment facilities. ?? High level services to additional 473,000 population.
<u><i>Objective 4</i></u>	a) Melamchi Water Supply Project	

<p>To implement water supply improvement programs in the Kathmandu valley to improve water supply and sanitation service level to high service level</p>	<p>b) Kathmandu Valley Urban Water Supply Project c) Kathmandu Water Supply Improvement Project d) System Development Program in 12 towns e) Dharan Water Supply Project f) Butwal Municipality Water Supply Project g) Production Improvement Project h) Urban Area Drinking Water and Sanitation Project i) Greater Sewerage Project</p>	<p>?? Melamchi Project is in implementation (to be completed in FY 2009/10) to provide services to an additional population of 473000 and an improved services to 800000 population ?? Provide additional 473,000 with High level of water service and additional 1,808,000 population with sanitation services.</p>
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4.2 Strategies

Following strategies have been adopted to support the target and the outlined activities:

1. Water supply projects will be implemented on the principles of cost recovery in such a way that the operation costs will be fully recovered from the users in rural water supply programs and the operation as well as other costs will be recovered from the users in urban water supply projects.
2. Rural water supply schemes will be implemented on a demand and need based approach by maximum utilization of local resources with active participation by users.
3. Emphasis will be given to enhancing the skills and capacities of the user committees and non-governmental organizations to implement rural water supply schemes.
4. Priority will be given to the use of appropriate simple technologies that can be sustained by local communities. Alternative technologies like rainwater harvesting, solar pumps, hydrams, etc. will be promoted for water supply where adequate perennial sources are not found.
5. Rural water supply schemes requiring rehabilitation as well as incomplete schemes will be implemented with high priority.
6. Policy of conserving and developing water resources within the watershed area through integrated (conjunctive) management of ground and surface water sources will be adopted.
7. Sanitation programs will be implemented as integral component of a water supply project.
8. National drinking water quality guidelines will be prepared and Quality Monitoring and Control Mechanism will be strengthened to provide safe water.
9. As per the principles of the decentralization policy, water supply facilities will be developed and expanded by involving and allocating responsibility to District Development Committees, Village Development Committees and Municipalities besides promoting private sector involvement.
10. Monitoring of the services by the regulating agency will be gradually expanded to services provided by the government, private, semi-government, users' committees in urban and semi urban areas.

4.3 Prioritization Criteria and Priority Programs

As it has become necessary to minimize wasteful scattering of the scarce resources, the Tenth Plan document has provided a prioritization criteria for implementation of projects. The provision of basic services has been accorded a higher priority than service level improvement programs.. The projects currently under implementation have been into three categories. The prioritization has been carried out in accordance with the recommendation by Public Expenditure Review Commission (PERC).

Different set of criteria have been used for prioritizing rural and urban programs. As an example, local organization and participation are considered as key parameters of sustainability in rural areas, while cost recovery has been taken as sustainability criteria in urban areas. The general prioritization is based on the following parameters:

- ?? *Contribution to major national objectives*
- ?? *Contribution to sectoral objectives*
- ?? *Contribution to achieving regional balance*
- ?? *Extent of HMG involvement/funding*
- ?? *Level of people's participation*
- ?? *Sustainability/Level of local organization's participation*
- ?? *Level of previous performance*

Based on the above principles, following programs have been categorized as Priority I projects:

- (i) Rehabilitation and Repair Project
- (ii) Rural Water Supply and Fund Development Board
- (iii) Rainwater Harvesting
- (iv) Water Supply Leakage Control and Repair Program
- (v) National Management Information and Monitoring
- (vi) Community Water Supply Project
- (vii) Environmental Sanitation Project
- (viii) Water Supply and Sewerage Program
- (ix) Rural Water Supply Project

In an effort to achieve the targets, sets of program are being implemented with internal resources of the government as well with foreign assistance. The gap in the resources that are required to achieve the target is still high, which calls for additional resources towards meeting the targets set forth by the Tenth Plan document and in achieving the long term vision and objectives.

4.4 Efforts to Achieve the Tenth Plan Period Target

His Majesty's Government of Nepal will continue to accord high priority to the sector development and will therefore commit to allocating resources within its capacity. Some of the activities that will be supported through government initiatives include:

- ?? Refinement of plans, policies, acts and regulations to support the sector initiatives
- ?? Budgetary support for human resources development and administrative costs for undertaking rural water supply and sanitation
- ?? Local Partnership Programs with District Development Committees (DDCs) and Village Development Committees (VDCs) for construction of small facilities and repair and rehabilitation of existing systems.
- ?? Provide budgetary support to small repairs for the constructed facilities
- ?? Setting up of conducive environment for water users' committees (WUCs) through awareness building, hygiene education promotion and training
- ?? Institutional restructuring to address the updated needs throughout the period to achieve better sustainability, quality of service, support to communities, etc.
- ?? Adequate budgetary support for completion of projects already being implemented at the district levels for ensuring timely completion of projects and early harnessing of benefits.
- ?? Support for point source improvement and development.
- ?? Counterpart support for loan/grant assistance projects
- ?? Design and implementation of a Monitoring and Evaluation Program.

5 Identification of Programs for the Tenth Plan Period

Following specific programs have been identified towards achieving the long term objectives of the government (i) to expand the coverage to population deprived of safe water supply and (ii) to increase the service level in areas already having a water system. These are:

5.1 Increasing coverage to population without access to basic services

(a) Rainwater Harvesting Program: Rainwater harvesting has proved to be a practical and efficient solution for areas, which are located on hill ridges with low population density. A reliable gravity source is either usually difficult to find or is technically and economically unfeasible to be developed. A similar program is currently being implemented at a smaller scale with HMGN resources on isolated areas. The program is being implemented by FINNIDA in Lumbini Zone and has been received well by the communities. The requirements generally include improvement in roofing materials for houses and construction of storage tanks to store water safely over long period of time. The National Water Plan currently under preparation by Water and Energy Secretariat of HMGN has estimated that around 40,000 people may benefit from such a program. The estimated cost for such a program during the Tenth Five Year Plan is about US\$ 1,000,000

(b) Community Based Water Supply and Sanitation Sector Project: This project has been designed for implementation with loan assistance from ADB. The Project aims to construct around 1200 community-based gravity fed schemes in the all the districts of the Mid-western and Far-western regions. Benefited population of the project is estimated to be 1,200,000 and cost estimate of us \$ 37.5 Millions of which \$ 12.5 Millions is to be borne internally with HMGN resources.

(c) Rural Water Supply Project/ Water Resources Management Program/ NGO Programs: These programs are being implemented in different parts of Nepal at different scales by national and international NGOs. Some of the programs are Water Resources Management Program being implemented with financial assistance of Helvetas, Water Supply and Sanitation Program being implemented under the Gorkha Welfare Fund, Water and Sanitation Program being implemented by NEWAH – a national NGO under support from Water Aid, Plan International, CARE Nepal, etc. These projects are also supported by bilateral development partners like DFID. Such programs implemented through NGO initiatives have been very effective in providing services to the poor communities in the remote areas. As such programs run by NGOs have a relatively flexible modality and are more focused they are found to be quite efficient in meeting their objectives. Which results into flexible implementation, it is requested that partner communities provide more support to such programs.

(d) Rural Water Supply & Sanitation Fund Development Board: Activities under the RWSSFDB is presently being supported with IDA assistance. RWSSFDB aims to implement about 1260 community-based projects during 10th five year plan approved.

5.2 Service Level Upgrading Programs

The projects designed for provision of basic level services, need upgrading of service level to meet the ever-growing demands of improved water supply services. List of currently identified projects for the service level upgrading is as follows:

(a) Water Quality Improvement Program: This program is designed to address the need of treatment facilities in various projects that have been previously constructed without treatment facilities, usually in minor towns and major rural market centers, where water quality is under increasing threat of contamination. A key component of the Project will also be to support the enactment and enforcement of water quality standards as well as to introduce a monitoring and surveillance program in a phased manner for rural areas. The resource requirements are high but it is estimated that about US\$ 2 to 5 million will be needed during the Tenth Five Year Plan period.

(b) Small Town Water Supply and Sanitation Sector Project: Altogether 209 projects are identified for implementation in emerging towns of the country. The projects are aimed

to bring about substantial improvement in water supply and sanitation situation in emerging market centers, mostly along the road corridor and district headquarters. Improvement in Water Supply and Environmental Sanitation are targeted under an integrated programming approach. As a first package, programs are being implemented in 43 emerging towns of the country under an ADB loan assistance. The program will help to serve an additional population of 465,600 and to bring about improved service delivery to 23,20,000 population. Implementation of projects in small towns, which are usually emerging market centers or district headquarters, will help in equitable distribution of benefits and to some extent help to contain out-migration. Resources amounting to approximately US\$ 200 million are required for implementation of programs in the remaining 166 emerging towns.

(c) Rehabilitation Program: Benefits are not being fully realized from several projects constructed in the past as these systems are either not functioning at all or are only partially delivering the intended benefits. Resource requirement for renewal and repair are large in aggregated but the project can be packaged in accordance to available resources. Usually, the systems are being operated and maintained by Water User Committees, who are able to generate operation funds for regular operation but the communities can not pay for the larger repair requirements. The repair requirements are generally a result of natural calamity, expiry of useful project life, etc. HMGN has accorded high priority to the Rehabilitation Program as it can result into derivation of benefits at a much lower cost than construction of new facilities. The estimated resource requirement for the Tenth Plan period is about US\$ 80 million.

(d) Management Transfer Program: Government has a policy to provide operation grants as incentives to WUCs for management of the services. The grant is extended to support the energy costs and a portion of the staffing requirement and follows a declining rate of support pattern. However, about 515 projects, most of which were constructed during the 1990s, are in need of major repair and are therefore not delivering the intended benefits. Local communities are unwilling to accept the operation and maintenance responsibility without the required repair. Substantial resources are required to bring these projects back into operation in healthy state after which the operation and maintenance can be transferred to the local communities. The resource requirement is about US\$ 20 million during the Tenth Plan period.

5.3 Sanitation Education and Hygiene Promotion Program: In an effort to improve the domestic sanitation situation, especially human excreta disposal, two types of sanitation promotion activities are being carried out through out the country. They are:

(a) On-site sanitation and Hygiene Education: The program is designed to bring about effective change in human behavior through awareness raising and educational activities. The increased awareness is expected to result into construction of on site sanitation facilities at the household levels. The program will be undertaken in partnership with local Authorities, community based organizations (CBOs), WUCs and local NGOs.

(b) Sanitary Sewerage System: Densely populated settlement, where it is unfeasible to construct on-site treatment facilities on technical, environmental and economic grounds will be gradually provided with sanitary sewer facilities.

5.4 Support Programs: In addition to the above directly contributing programmes, two support programs have been identified, which are currently being implemented through government resources but where additional resources are required to speed up the efforts.

(a) Human Resources Development Program: Capacity building of the sector agency staff and the community workers like WUC members, VMWs, volunteers, etc. needs to be enhanced. HRD initiatives will be to promote decentralization and participatory actions by building capacity at local levels. Support at the national level will focus on efforts to promote and strengthen.

(b) National Management Information Program: A well designed and maintained management information system is critical to planning of activities. This program is targeted to help create reliable database for planning, monitoring, implementation strengthening and benefit evaluation. Currently DWSS is implementing the National Management Information Project, which needs up scaling.

6. Gap in Resources and Programs for External Support

Although the above programs have been identified to meet the target laid out by the Tenth Plan document, the objectives of the Tenth Plan will not be met without coordinating and complementing the efforts from the government, NGOs and the development partners. It is therefore attempted to identify the gaps in resources where support from development partners will be required to meet the objectives.

6.1 Summary of Estimated Expenditures

The breakdown of resource requirements and gap in resources is as presented below.

		Resources Management for								
		10 th Plan			11 th Plan			12 th Plan		
Projects		Need	Ava	Gap	Need	Ava	Gap	Need	Ava	Gap
Water supply and sanitation coverage expansion projects(Objective 1&2)		17323	10855	6468	24241	7739	16502	10548	6948	3600
Service level upgrading projects (Objective 3)		15025	8783	6242	13112	3953	9159	4900	1549	3351
Melamchi Project (Objective 4)		16950	16950		21450	21450				
Total		49298	36588	12710	58803	33141	25662	15448	8497	6951

Ava = Available

6.2 Programs targeted for external support

External support is required to effectively support the sector to meet the Tenth Plan targets. As such, the following priority programs have been suggested for support by external agencies:

(a) Community Water Supply and Sanitation Improvement Program: The water supply coverage is low in the Eastern, Central and Western Region Development Regions. Most of the systems to be constructed will include simple gravity fed water supply systems. Sanitation will be an integral component of the water supply. The communities will have central role in planning, implementation and operation and maintenance of constructed facilities. The project will provide water supply to about 1000,000 populations at an estimated cost of US\$ 35 million.

(b) Rural Sanitation Improvement Program: Sanitation facilities presently lag far behind water supply coverage. The rural sanitation improvement program will serve about 3,600,000 people. The cost is about US\$ 6 million.

(c) Water Quality Improvement Program: This project will focus on the improvement of water quality in high density market centers. It will also address the

currently emerging problem of arsenic in ground water in some of the Terai districts. Resource requirements are large but the work can be packaged according to available funding. Issues related to contamination in Terai tubewells by Arsenic will also be dealt under this program.

(d) Semi-Urban Water Supply Projects: The number and size of municipalities are increasing. Many of these municipalities have parts or areas of the town, which are without water supply and sanitation services. Similarly, a large number of emerging settlements don't have adequate services to meet the growing demands of the urbanizing settlements. These areas need additional projects to meet the demands of 1,890,000 populations within the plan period.

(e) Sewerage Management Project: Fast urbanization of rural settlements in recent past has resulted in deterioration of the environment in these settlements. The situation has further worsened due to lack of proper management of the storm and wastewater management systems in place. Since, the construction and management of sewerage system is a costly affair, investment from government alone is not practically possible. With this in mind, the projects selection criteria are decided with careful consideration for sustenance. The development of a system is decided on principle of capital cost recovery of investment and operation and maintenance.

(f) Water Supply Development Support: In order to consolidate the benefits of physical facilities constructed for water supply and sanitation services external support and expertise are also solicited in the fields of Management Support, Establishment of Management Information Systems, Development and Implementation of Monitoring and Evaluation Program, Sanitation Awareness and Promotion Activities, etc.

7 Institutional Arrangements

The related sector ministry is the Ministry of Physical Planning and Works that is responsible for policy formulation and overall coordination. The Ministry has now been imparted the pivotal role of monitoring and evaluation of the programs by establishing a monitoring and evaluation unit and by providing it with the responsibility to monitor the disbursements from the sector account.

Many agencies are involved in the development of rural water supply and sanitation sector. The main agencies involved at present are:

- ?? Department of Water Supply and Sewerage (DWSS) in rural areas and small urban centers.
- ?? Rural Water Supply and Sanitation Fund Development Board (RWSSFDB) in rural areas.
- ?? National Non-Governmental Organizations (NGOs), International Non-Governmental Organizations (INGOs), and Community Based Organizations (CBOs).
- ?? Local Government agencies (VDCs and DDCs)
- ?? Users Committees.

DWSS and RWSSFDB are government agencies that use the fund made available by the government for water supply and sanitation development. The budgets allocated by the government for the sector is used by these agencies for water supply development.

The DWSS is the designated lead agency of the sector and is responsible for overall inter-agency coordination as well as coordination between different sector agencies. The DWSS's role as an implementer has been largely limited although it still assumes the role of an implementing agency for some donor supported projects as well as HMGN funded district level programs. The implementational role of DWSS in these programs has progressively undergone reduction from that of direct implementation for the development of water supply and sanitation as well as other programs funded under donor support. The DWSS program implementation are largely community based where programs are identified at the district level and where the communities undertake the frontline implementation responsibilities. DWSS then acts as a facilitator to these programs. The DWSS is currently undertaking programs related to Community Water Supply and Sanitation, Water Quality Improvement, Human Resources Development and HMGN supported District Level Water Supply and Sanitation

Programs. The DWSS has been restructured to assume this role by establishing 5 regional monitoring and coordination, 43 divisional and 27 sub divisional offices. These offices will now provide technical assistance to District Infrastructure Development Offices (DIDO).

A Rural Water Supply and Sanitation Fund Development Board (RWSSFDB) has also been formed to undertake implementation of programs through NGO intermediation. Initially established to undertake the implementation of World Bank assistance in the sector, the institution has been internalized within the government structure owing to its success in implementation of demand responsive programs. The Rural Water Supply and Sanitation Fund Board Act has been recently prepared. In line with the Act the existing formation order was revised and other related legislative requirements have been recently approved by HMGN to institutionalize RWSSFDB within the regular government structure. A World Bank loan amounting to about US\$ 42 million is currently under processing to support the RWSSFDB activities.

Many non-governmental agencies are working in the water supply and sanitation sector since last many years. They have been involved in awareness building, health and sanitation education and implementation of water supply and sanitation schemes. The government policy is to mobilize NGOs as partners in the development of the sector. INGOs & NGOs channelize their own resources also to implement water supply and sanitation projects such as of NEWAH and Gorkha Welfare Schemes (GWS)

The Department of Local Infrastructure Development and Agriculture Roads (DOLIDAR) also undertakes smaller community level programs undertaken for implementation at the district level.

District Development Committees (DDCs) are the local planning institutions, which are responsible to identify and prioritize projects and use a part of the fund made available to them by government for the development of water supply and sanitation services. The new policy document has defined that all programs will be implemented only after approval of the programs by the DDCs, with the intention to provide a coordinated development as well as to support the spirit of decentralization.

Water User Committees (WUCs) are agencies established at the community level for undertaking implementation and operation and maintenance responsibilities once the facilities are commissioned. Water Users Committees are the grass root level where the capability of water supply system management has greatly enhanced in recent years.

8. Monitoring and Evaluation

District Development Committees will undertake the monitoring of the WSS sector at the district level. At the regional level, monitoring offices of the DWSS will monitor and evaluate the rural water supply sector. At the central level, the monitoring and evaluation in the sector will be made effective by establishing a separate monitoring and evaluation unit. In monitoring the sector, production indicators, like cost effectiveness, amount of community contribution, service to poor and deprived people, and outcome indicators, like improvement in health and sanitation, and reduction in incidence of water borne diseases, will be used. DDCs and VDCs will be strengthened to undertake program monitoring at the local levels.

9. Impact of Conflict

Only isolated cases of damage to completed water supply and sanitation systems have occurred as a result of the present conflict situation. As water supply and sanitation are basic necessities having a direct impact on daily life of the people, the programs are still winning support even in largely conflict dominated areas. However, programs monitoring in conflict areas has been difficult. The increased role of DDCs and VDCs in programs monitoring is expected to help to overcome this obstacle to a large extent. Despite all efforts, environment of security is critical to implementing the programs outlined in this report.

10. Risks

Following have been identified as the major risk in successful implementation of the programs:

- ?? environment of conflict and security
- ?? increasing disputes over water sources
- ?? increasing contamination of water sources
- ?? capacity building of local bodies and stability of such organizations
- ?? inadequate flow of resources

11. Conclusion

The government's target to provide basic water supply facilities to a hundred percent and basic sanitation facilities to eighty percent of the national population is a challenging task in terms of resource requirements. The government is fully committed to creating a conducive environment through policy, institution and operational reforms to achieve this target as well as to allocating resources within its budgetary framework. Expanded support by development partners in this area will help the government to address poverty in rural areas by providing opportunities of better health and productivity to the rural population.

Annex 1

Linkage of programs and programs' objectives with strategies

S.N	Programs	Cost	Objectives of the program	Linkage with the strategy
1	Rainwater Harvesting Program	\$ 1 Million	Provide water supply access to the needy population; Increase the water supply coverage	Operation cost fully recovered; Utilization of local resources; Use of simple appropriate technology.
2	Community Based Water Supply and Sanitation Sector Project	\$ 37.5 Million	Provide water supply access to the needy population; Increase the water supply and sanitation coverage	Operation cost fully recovered; Utilization of local resources; Water supply facilities be developed and expanded; Use of simple appropriate technology
3	Rural Water Supply Projects/ Water Resources Management Program/ NGO Programs	\$	Provide water supply access to the needy population; Increase the water supply and sanitation coverage	Operation cost fully recovered; Utilization of local resources; Water supply facilities be developed and expanded; Use of simple appropriate technology
4	Rural Water Supply & Sanitation Fund Development Board	\$ 42 Million	Provide water supply access to the needy population; Increase the water supply and sanitation coverage	Operation cost fully recovered; Utilization of local resources; Water supply facilities be developed and expanded; Use of simple appropriate technology
5	Water Quality Improvement Program	\$ 2-5 Million	Provide water supply access to the needy population; Upgrade water supply service to provide high service level; Increase the population of high service level	Operation cost fully recovered; Quality Monitoring and Control Mechanism be strengthened to provide safe water.
6	Small Town Water Supply and Sanitation Sector Project	\$ 35 Million	Provide water supply access to the needy population; Upgrade water supply service to provide high service level; Increase the supply and sanitation coverage; Increase the population of high service level	Operation cost fully recovered; Water supply facilities be developed and expanded; Sanitation programs be implemented as integral component of a water supply project; Quality Monitoring and Control Mechanism be strengthened to provide safe water.
7	Rehabilitation Program	\$ 80 Million	Provide water supply access to the needy population; Increase the water supply and sanitation coverage	Operation cost fully recovered; Rural water supply schemes requiring rehabilitation be implemented; Water supply facilities be developed and expanded
8	Management Transfer Program	\$ 20 Million	Increase the water supply and sanitation	Operation cost fully recovered; Water supply

S.N	Programs	Cost	Objectives of the program	Linkage with the strategy
			coverage	facilities be developed and expanded
10	Sanitary Sewerage System	\$	Increase the sanitation coverage	Operation cost fully recovered; Sanitation facilities be developed and expanded
11	Human Resources Development Program	\$	Support program to increase the water supply and sanitation coverage	Monitoring of the services
12	National Management Information Program	\$	Support program to increase the water supply and sanitation coverage	Monitoring of the services

Population coverage by water supply and sanitation through different programs

Sr	Program type	Population benefited by water supply	Population having access to sanitation
1	DWSS programs	2,560,000	5,183,000
2	RWSSFB program	950,000	464,000
3	MWSDB program	1,600,000	-
4	MLD program	300,000	600,000
5	NGO/INGO program	250,000	500,000

Basis taken for the cost estimation for different types of schemes

Sr	Types of projects	Unit cost per capita Rs	Population per scheme
1	New gravity scheme	2700	600
2	Rain water harvesting	3000	300
3	Tube well scheme	1150	1000
4	Rehabilitation of old projects	250,000 per project	