



Government of Nepal, Melamchi Sub-Project 2 Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited

*Improvements in water, sanitation and sewerage management
Lay the base for a developed society; make a city beautiful and efficient*

Brief Introduction of Project Implementation Directorate (PID)

Government of Nepal has accorded a high priority to the task of providing safe and adequate drinking water in an equitable manner to the people of the Kathmandu Valley. Residents of the Kathmandu Valley have been suffering from the hardship caused due to lack of adequate and safe drinking water since long. The government is implementing the Melamchi Water Supply Project, started in December 2000, to solve the chronic drinking water shortage situation in the Valley on a sustainable basis. The Project aims to achieve this objective by providing additional 510 MLD of water to the Kathmandu Valley from Melamchi, Yangri and Larke rivers of Sindhupalchowk district. In the first phase of the project, 170 million liters of water will be diverted daily to the Valley, starting on the day of Nepali new year in April 2016 (2073 Baisakh 1), through a 27.5 kilometer diversion tunnel being constructed from Melamchi to Sundarijal.



Road Crossing Works being carried out for pipe laying at night time in Ring Road at Ekantakuna of Lalitpur

According to the government plans, capacity to equitably distribute large volume of water, which will be supplied from the Melamchi River in Sindhupalchowk district through a tunnel, will be enhanced through construction of a Bulk Distribution System, construction of a number of reservoirs and improvement in the distribution network inside the Kathmandu Valley. Initially, the Melamchi Water Supply Project was configured to implement all of these activities under an umbrella of the Melamchi Water Supply Development Board, but later in February 2008, the project was divided into Subprojects 1 & 2 for its efficient implementation.

Responsibility to implement Subproject 1, which includes construction of water diversion tunnel and construction of a Water Treatment Plant at Sundarijal have been assigned to the Melamchi Water Supply Development Board. So far construction of 8.3 km. of tunnel has been completed under this subproject. Scope of Sub-Project 2, being implemented by the Project Implementation Directorate of Kathmandu Upatyaka Khanepani Limited, includes construction of service reservoirs in several locations within the Kathmandu Valley, construction of a Bulk Distribution System to transport water from Water Treatment Plant at Sundarijal to the service reservoirs, Distribution Network Improvement works to carry water from reservoirs to household taps, improvement of Sewerage Network in the Valley and construction of a Wastewater Treatment Plant.

Lack of sufficient water sources, in-equitable distribution of water and leakage are the major problems that lead to the hardship situation of water supply for the Kathmandu Valley residents. On one hand, it has not been possible to meet the water demand of the Valley due to insufficient water sources, and on the other, even available water cannot be distributed to households in the



Pipes being laid at Nayapati of Kathmandu as part of the Bulk Distribution System.

absence of a systematically laid out distribution network that supports to achieve equitable distribution of water supply. As a result of this constraint, some areas in the Valley are receiving plenty of water, where as in other areas the supply is poor- some locations receiving water only once a week. Leakage in the system is high as several areas in Kathmandu are still receiving water from worn-out pipes that were laid during the Rana regime, when the first water supply system installations were being made over century ago, and through an improperly laid out network. Diversion of water from the Melamchi Valley and other associated reforms are expected to appropriately address the above issues and meet the water demand of the Kathmandu Valley on a long-term sustainable basis. Works are being expeditiously carried out to construct the Bulk Distribution System and reservoirs for equitable distribution of water and to improve the Distribution Network, in line with modern engineering practices, with the objective of reducing system leakages.

Inauguration of Distribution Network Improvement in Kathmandu Valley



Minister for Urban Development Honorable Dr. Narayan Khadka initiated the construction works of Distribution Network Improvement under the Kathmandu Valley Water Supply Improvement Project on 2 April 2014, amidst at a function organized at Koteshwor, Kathmandu.

Speaking at the function, chief guest Minister Dr. Khadka, expressed commitments to complete all necessary infrastructure works, including improvement of the distribution system, and start supplying Melamchi water to households in Kathmandu from onwards the dawn of Nepali New Year's day in April 2016 (1 Baisakh 2073). Members of Parliament from Kathmandu, Lalitpur and Bhaktapur districts attended the function. They vowed to extend their necessary cooperation to realize the dream of transporting the water from Melamchi to the Kathmandu Valley within the stipulated time.

Projects Being Implemented Under PID

Project Implementation Directorate (PID) is implementing the following projects with assistance from the Government of Nepal and the Asian Development Bank. By implementing these projects, PID aims to resolve the scarcity of drinking water in the Kathmandu Valley on a long-term basis through launch of an efficient system for operation and management of water supply services, water distribution network and sewerage management practices.

Kathmandu Valley Water Supply and Sanitation Project

Project Implementation Directorate has started the implementation of Kathmandu Valley Water Supply and Sanitation Project from 2011. The project aims to augment the supply to meet water demand in Kathmandu Valley in the immediate term and undertake improvements of the distribution network on a priority basis to control leakage in the distribution system. The project will carry out activities to augment the supply by carrying out measures to improve the yield from surface and underground sources available within the Valley and create required infrastructure to supply it to the consumers. Following activities have so far been completed under the project:

- ❁ Additional 6.5 million liters of water made available daily to the Valley's distribution system by commissioning of five tube-wells in the first phase.
- ❁ About 5.5 million liters of water will be added daily to the Valley's distribution system after completing the source improvement works in Nakkhu river.



A tube-well under construction at Bode of Thimi, Bhaktapur.

- ❁ About 10 million liters of water will be added daily from Bagmati River to the Valley's distribution system by augmenting the collection capacity at Sundarijal.
- ❁ Drilling works completed in 13 out of 15 tube-wells being constructed in the second phase. About 15 million liters water will be added daily in the Valley's distribution system from seven of these completed tube-wells.
- ❁ Pipe laying works had been completed for six kilometers out of the total 9.6 kilometers of 1400 mm diameters pipe laying from Sundarijal Water Treatment Plant to Mahankalchaur reservoir.
- ❁ Construction of 123,000 liters capacity water treatment plant completed at the premises of Tribhuvan International Airport to treat the water being supplied from existing tube-well.
- ❁ About 7,800 households provided with new service connections in Kusunti, Kalopul and Gokarna areas under the model Demonstration Project.

Kathmandu Valley Waste Water Management Project

Kathmandu Valley Waste water Management Project has been initiated to properly manage the additionally generated waste water that is expected as a result of increase in water consumption when Melamchi water becomes available for supply. The Project includes rehabilitation, improvement and reconstruction of waste water management facilities in Kathmandu Valley. The Project also plans to lay 130 kilometers of sewerage interceptors along the banks of major rivers in the Valley. Existing wastewater treatment facilities at Gokarna, Guheshwori, Salaghari, Kodku and Dhobighat will be rehabilitated and upgraded and their treatment capacity will be increased. A new wastewater treatment facility will be constructed in Khokana. Design works have already started, following selection of consultants, towards improvement of sewerage system and construction of sewage treatment facility in near future. Works have also started towards acquiring 40 hectares of land that will be required for construction of new treatment facility at Khokana.

Kathmandu Valley Water Supply Improvement Project (KVWSIP)

Kathmandu Valley Water Supply Improvement Project (KVWSIP), which is under implementation since September 2012, aims to create an efficient water distribution system by improving upon the water supply services and situation in Kathmandu Valley. Construction of large Service Reservoir Tanks (SRT) in several locations of Kathmandu Valley, Bulk Distribution System (BDS), and Distribution



Secretary at the Ministry of Urban Development Mr. Kishor Thapa being briefed on ongoing construction works undertaken as part of the Distribution Network Improvement at Maitidevi, Kathmandu.

Network Improvement (DNI) are major works that are being carried out under the project with the objective of achieving equitable distribution of Melamchi water to households in Kathmandu Valley, after it flows out from the tunnel. Construction works of the Bulk Distribution and the Service Reservoirs (BDS-SRT) will be completed under five separate packages. Nine large Reservoir Tanks, with a combined water holding capacity of 65000 cum will be constructed in Arubari, Mahankalchaur, Bansbari, Balaju, Panipokhari, and Kirtipur in Kathmandu, Khumaltar in Lalitpur and Katunje and Tigni in Bhaktapur districts. Construction of 78 kilometers of Bulk Distribution Pipeline will also be undertaken. About 700 kilometers of pipe laying works will be carried out/extended along Ring Road and surrounding urban areas as a part of the Distribution Network Improvement.

Distribution Network Improvement (DNI) is divided into three packages and eleven service areas. The DNI works will be carried out on the basis of District Metering Areas (DMA) according to which,



Construction works being carried out under the Distribution Network Improvement activity between Setopul of Maitidevi and main road of Old Baneshwor in Kathmandu.

one DNI is divided at least into two DMAs. The DMA is the smallest service area unit in the distribution network improvement activity, by which performance and functioning of the distribution network may be monitored and evaluated. Following works have so far been completed under this project:

- ❁ About 43 kilometers of pipe laying works and 4000 house connection have been completed in Koteshwor, Maitidevi, Old Baneshwor and surrounding areas.
- ❁ Detailed study and design works as necessary, signing of agreements with contractors for construction of service reservoirs in various locations of Kathmandu Valley, as well as laying of transmission lines in Ring Road and in areas outside the Ring Road have begun. These works will facilitate for equitable

distribution of water from Melamchi as it comes out of the Bulk Distribution System. Construction of two tube-wells have been completed and drilling works have started in other two wells under the third phase of tube-well installation program, which targets to install further 20 tube-wells in different locations inside Kathmandu Valley.

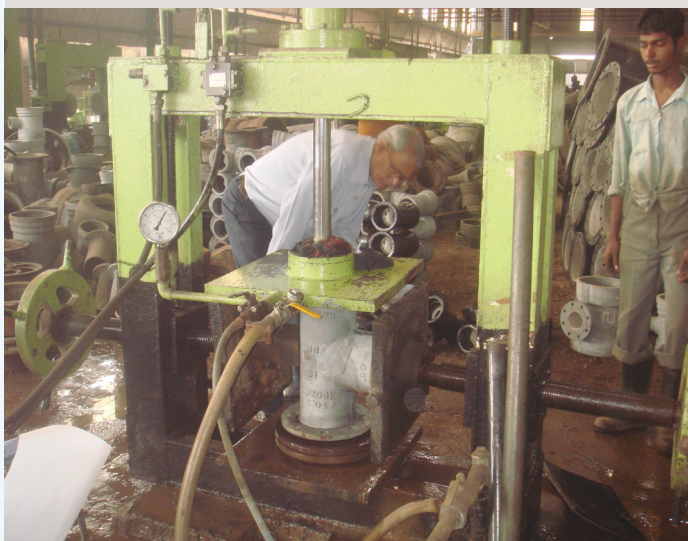
Project Management Procedures....

The Project Implementation Directorate (PID) has procured services of Design and Supervision Consultants (DSC) and Community Awareness and Participation Consultants (CAPC) to assist in the implementation of the project activities comprising the Bulk Distribution System, construction of Service Reservoirs, and construction and management of Distribution Network, which are required to ensure efficient distribution of water being transported from Melamchi through a tunnel. The DSCs are providing services for carrying out engineering designs and drawings and preparing cost estimates of works related to the Bulk Distribution System, construction of Service Reservoirs and Distribution Network Improvement. National and international contractors awarded with these construction contracts are advancing their respective section of works. Dissemination of factual information related to construction and extension of pipelines to local community in project areas, resolution of disputes, social safeguard and resettlement program, health and hygiene and other promotional programs as well as public awareness and communication programs are being carried out. Additionally, PID is undertaking regular consultation and coordination with project related stakeholders and authorities from roads, electricity, telephone, traffic police and general public for smooth implementation of the project.

Quality Assurance Process in the Project

PID accords high priority in ensuring that pipes, fittings and other construction materials used in the Bulk Distribution System, Service Reservoir construction and Distribution Network Improvement are of good quality. To this effect, one hundred percent of the materials used in the project are subject to an independent third party inspection. Following procedures are applied by the project to ensure quality of construction materials:

- 💧 Contractors are made responsible to ensure that the materials supplied and used in construction works comply fully with contract specifications. International Consultants have been appointed to monitor and supervise quality assurance activities.
- 💧 Contractors submit a Quality Assurance Plan to the consultants before starting construction works, after satisfying themselves with the quality of construction materials to be used and their originating factories.



Third Party inspection being carried out to ensure quality of construction materials.

- 💧 Consultant approves the Quality Assurance Plan submitted by the contractor after studying it in detail.
- 💧 The manufacturing plant/factory starts production of materials as per the Quality Assurance Plan submitted by the contractor.

Representatives of the independent third party quality inspectors inspect the quality of the materials and its production processes. A team comprising representatives from PID, Department of Standards and Metrology and the Consultant monitor the inspection process.

- 💧 Only those construction materials that get through the quality inspection are delivered to the construction site, which further undergo a confirmatory inspection by the Third Party inspectors to confirm that the supplied materials are same as the approved ones. Consultants monitor the construction materials after verification by the Third Party. Only those materials, which clear this rigorous process of inspection and quality control, are used in the construction.

Gender Equality and Social Inclusion in the Project

Kathmandu Valley Water Supply Improvement Project, one of the three projects being implemented by the PID, has prepared a Gender Equality and Social Inclusion Action Plan (GESI AP). As prescribed by the Action Plan, all project activities are aligned to the GESI AP. The Project activities also comply with the GESI Operational Guidelines, 2013 approved by the Ministry of Urban Development.

Following are the steps taken so far in the Project to ensure compliance to GESI AP:

- 💧 Project questionnaires for baseline socio-economic survey are designed to ensure that female headed household (FHHs), households of poor and socially-excluded groups, caste, ethnicity and other minority groups are identified and disaggregated information on their socio-economic status is collected.
- 💧 Two hundred and fifty one local (Tole) meetings have so far been conducted within the project area to disseminate information on various project activities. Amongst the participants, 30% were women, 39% were from different indigenous groups, 4% were from dalit community and 57% were from other caste groups.



A glimpse of community meeting being held in the Distribution Network Improvement area.

- 💧 A disaggregated database as above, based on the records of participation in different project activities, is being prepared. This helps in record keeping, monitoring and evaluation of project activities.
- 💧 Sixteen interaction programs have so far been conducted under the Public Awareness Health and Sanitation Program for teachers and students of various schools within the project area. Records show that nearly 40% girl-students and lady-teachers participated in these programs.
- 💧 In accordance to the concept of making training programs gender friendly on issues like rainwater harvesting, solid waste reduction, reuse and recycling (3R), women groups and local residents from Arubari were trained regarding proper management of solid waste generated at the household levels. Compost bins were distributed to 40 households.

Project Activities

Monitoring of project activities by ADB's Review Mission

A regular review mission of ADB which was in Kathmandu from 25 March to 1 April, 2014 acquired information on various project activities being carried out by PID and monitored the works being undertaken in the field. During the visit, the mission led by Mr. Manoj Sharma, Senior Urban Development Specialist from ADB Headquarters, Manila held discussions with Project Director Mr. Tej Raj Bhatta, Deputy Project Directors, other officials of PID and Consultants and acquired information on various project activities. During the stay in Nepal, the Mission also inspected pipe laying works being carried out for Bulk Distribution System at Nayapati and Gokarneshwor VDCs, construction of Tubewells at Airport-Jadibuti, pipeline extension works being carried out through Electro-fusion technology at Koteshwor for Distribution Network Improvement, etc.



ADB mission monitoring the project activities.

Frequently Asked Questions (FAQs)

❁ **When will the water from Melamchi become available in Kathmandu?**

Ans: Melamchi water will be available from onwards the first day of Nepali new year, 1 Baisakh 2073 B.S. (Correspondingly, 17 April 2016) for supply in the Valley.

❁ **Will the water from Melamchi be distributed to each and every household of the Kathmandu Valley?**

Ans: Water from Melamchi will be supplied to every household in the urban areas of Kathmandu, Lalitpur, Bhaktapur, Thimi and Kirtipur in the Kathmandu Valley.

❁ **Will the water be available round the clock at the tap?**

Ans: Every household will initially get 8 hours of daily supply. Water will be available round the clock in taps after water become available from Yangri and Larke rivers in phased manners.

❁ **Will pump-motor be required to fill up the tanks at the house?**

Ans: No need. Water will reach up to the second floor height in most locations without using any pumping machinery and can be stored in tanks. Separate arrangements for pumping will be made to supply to houses built in higher locations.

❁ **Must water from Melamchi be purified for drinking?**

Ans: Water transported from Melamchi through the tunnel will be treated at the Water Treatment Plant located in Sundarijal. As different measures will be applied to maintain the quality of water collected in the service reservoirs from the Bulk Distribution System, no further treatment will be required. Water from the tap can be used directly for drinking and for other purposes.

❁ **Do general people have to pay extra charges after the water from Melamchi reaches their homes?**

Ans: As the water received from Melamchi will be of good quality and the distribution service will also be efficient, people will need to pay additional charges. But, if consider the coping cost today in terms of electricity required to operate the pump, and the time and labor expended for collection of water, the additional cost that people have to pay can be considered as minimal.

❁ **What do people have to do to get Melamchi water in their house taps?**

Ans: Customers who are in the KUKL's service area and have been regularly paying their water bills will receive Melamchi water in their house. But houses/plots that do not have a tap connection yet now will need to first get a tap connection by fulfilling prescribed requirements.

❁ **How will the water from Melamchi get distributed in Kathmandu Valley?**

Ans: Water from Melamchi will first be collected at the Sundarijal Water Treatment Plant. It will then be carried by a Bulk Distribution System to reservoirs being built at several locations in Kathmandu. Such stored water will be distributed to the houses through an improved Distribution Network.

❁ **What kind of pipes will be laid in Kathmandu Valley to distribute the water from Melamchi?**

Ans: Ductile Iron (DI) and Polythene (HDPE PE 100) pipes will be laid. DI pipes are lined by a cement layer inside and coated with epoxy bitumen outside, which protects the pipe from air, water and mud. DI pipes do not get rusted and are much stronger and durable compared to other common pipes as they are manufactured using modern technology. DI pipes will be used in the Bulk Distribution System. Depending upon the road condition and population density in the area, DI pipes will also be laid in sizes between 150 mm to 1400 mm for the distribution network in the main and inner roads of Kathmandu and Lalitpur.

Polythene (HDPE PE 100) pipes will be used for further transportation of water, in sizes between 75 mm to 110 mm, for supplying it to the households. Having been manufactured from good quality materials, these polythene pipes have higher pressure resistance and are therefore strong and durable compared to other pipes.

❁ **How are these pipes joined during the laying process?**

Ans: HDPE PE 100 pipes are joined to their required lengths using Electro-fusion technique. As two such pipes are joined by placing them on a modern machine with a joining socket between them, the chances for leakage will be almost nil. PID aims to reduce the leakage down to 15%.

❁ **What kind of strategy has the Project adopted to lay the pipeline in the roads being expanded and constructed in the Kathmandu Valley?**

Ans: Project Implementation Directorate (PID) has adopted following strategies to lay pipelines in the roads of the Kathmandu Valley:

❁ Coordinate with the Road Expansion and Rehabilitation Project, for locations where road expansion is being currently carried out, to complete pipe laying works, as far as practical, before the road construction in such section is completed.

❁ Use the space under foot paths to lay distribution pipes wherever practical.

❁ For roads that are wider than seven meters, lay pipes on both sides of the road to minimize road damage.

❁ For pipelines falling under the already black topped sections of the road, pipe laying works will be carried out only towards the end stage of the Project. Roads will be reinstated to earlier condition after the pipes have been laid.

Construction of such projects for the benefit of general public is a once in a life time affair. Ministry of Urban Development and Project Implementation Directorate/ Kathmandu Upatyaka Khanepani Limited apologies for any inconvenience caused to the general public, caused as a result of activities being carried out towards implementing the project of general concern and benefit, and seek cooperation from all fronts for its smooth and successful completion.

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