

Kirtipur Housing Project

An eco-friendly community built on the principles of community based water resource management



A WaterAid report

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Front cover image: WaterAid/Marco Betti

This picture shows the Kirtipur Housing Project settlement and some of its inhabitants. The roofs and pipework visible here are used for the rainwater harvesting scheme, supported by WaterAid.

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Background

As in other cities in Nepal, increased urbanisation in Kathmandu has led to the growth of slum and squatter communities. Urban sprawls and the resulting growth in informal settlements are the results of growing population, unemployment and insecurity in rural areas. Rapid urbanisation has put strains on the basic services and infrastructure of the cities far beyond their existing capacities. A new project, the Kirtipur Housing Project is an attempt to achieve environmentally sustainable solutions to address the problems faced by the urban poor in slum and squatter communities, and minimise the many negative social and environmental impacts.

Kirtipur Housing Project: housing the poor

The Kirtipur Housing Project, the first project of its kind to address the issue of housing the urban poor with environmentally sustainable design solutions, has now become an example of Lumanti's (a local non governmental organisation focusing on urban shelter and a partner of WaterAid in Nepal) response to alternate housing solutions. It is also gaining unprecedented recognition in the sector. In fact, the Kirtipur Housing Project is not so much about the exploration of uncharted universal space but about visualising the problems relating to basic facilities, including housing and water supply and sanitation (WATSAN) facilities to the urban poor, particularly slums and squatters that threaten to engulf our cities today.

The Kirtipur Housing Project was designed to house those evicted homeless communities resulting from the Vishnumati Link Road (VLR) Project. The construction of the VLR, linking the north and south sections of the ring road around Kathmandu, was planned to run along the Vishnumati River, resulting in displacing a number of informal settlements, which had been there for over 50 years. The Kirtipur Housing Project is located at the scenic location of Paliphal, ward number 6 of the Kirtipur Municipality which is a world away from the deplorable conditions of the Vishnumati banks. The Kirtipur Housing Project, a pilot urban poor housing project, aimed to provide improved living conditions, and is unique in design due to its adoption of eco-friendly materials and principles of community based water resource management.

Collaboration of sector actors and donors

The Kirtipur Housing Project was implemented under the leadership of the Urban Community Support Fund (UCSF) created by the Kathmandu Metropolitan City (KMC), where Lumanti works as the Secretariat. Lumanti was solely responsible for materialising the Kirtipur Housing Project through its inception phase, resource generation and for the successful completion of the project with support of WaterAid in Nepal and its other urban partner organisations: Environment and Public Health Organization (ENPHO), Centre for Integrated Urban Development (CIUD), Urban Environment and Management Society (UEMS) and the Non Governmental Organisation (NGO) Forum for urban water supply and sanitation. The collaboration

on this project has not only resulted in a strong example of delivering basic services to the urban poor, but also as a good demonstration of the dynamic and innovative working approaches created through organisations with a variety of different specialisations working together.

The Kirtipur Housing Project was supported by KMC, UCSF, Department of Urban Development and Building Construction (DUDBC), Slum Dwellers International, WaterAid in Nepal, UN-HABITAT, Action Aid Nepal (AAN), and Asian Coalition for Housing Rights (ACHR). UCSF was created by KMC with its Secretariat in Lumanti to manage all the financial resources generated for this project. The resources gathered within UCSF were mobilised through Lumanti. Thus, Lumanti's role in fostering understanding between the donors and bringing them together has not only made the Kirtipur Housing Project possible but has also proved to be invaluable for future initiatives in these areas.

Cost effectiveness

The Kirtipur Housing Project is not an exploration into low cost housing solutions but an attempt to provide cost effective housing solutions for the disenfranchised, offering two types of building designs with plinth areas of 24.53m² and 28.90m² respectively, at NRs. 330,000 (£ 2,500) and NRs. 350,000 (£ 2,650). A total of 44 individual units have been constructed within an area of 3052.45m² (6 ropanis) of land in this eco-community.

Uncompromised in structural strength, these buildings are earthquake resistant and use standard reinforced cement concrete frames. Although the use of 0.1 m thick exposed brick walls, steel stairs, corrugated galvanized iron roofs with metal trusses have substantially reduced the construction cost, the main factor defining its cost effectiveness has been the compact master planning with the row housing system and the government providing subsidised land.

The 44 families rehabilitated in this settlement would not have been able to own this type of housing through personal investments. Considering this reality, UCSF provided the houses to the evicted families under an interest free loan which the community has to pay back within a period of 15 years. Thus, with government subsidy on land and interest free loan from UCSF, the Kirtipur Housing Project has become a pro-poor, affordable and cost effective project.

Community participation and ownership

Since the inception phase of the Kirtipur Housing Project, the urban poor evicted from their slum settlements demonstrated their capacities in developing viable solutions; demanding housing rights and land tenure, engaging in the planning of the houses and remaining firmly committed to building a better life for their families and communities as a whole. The establishment of the Kirtipur Housing Management Committee (KHMC) is a testament to this, and has taken the responsibility for getting

the Kirtipur Housing Project completed on time and realising the dream of the evicted families.

The unanimous choice for this type of planning was as a result of individual claims to ownership, likely fed by an inborn desire to own a house in a lifetime and the desire to have better access to services. The project is a result of community involvement and their prioritisation; a concept of squatters as clients. Therefore, the Kirtipur Housing Project reflects the true aspirations and commitments of slum dwellers demonstrating the true level of ownership within the community.

The Kirtipur Housing Project and its houses will remain owned by UCSF until the loans are repaid by the owners (as per the commitments made) in 15 years. The individuals are not allowed to sell their houses without the consensus of KHMC to ensure that the new buyer also comes from a poor community of any other urban slum or squatter. The feeling of ownership and pride held by the people to what they have accomplished is a direct reflection of their long and dedicated struggle against all odds.

WaterAid in Nepal's engagement: a step towards environmental sustainability with the community based water resource management initiative

Environmental sustainability of this project is another paradigm which has resulted in this project having unprecedented significance. Environmental sustainability is a global issue that requires a local solution and the Kirtipur Housing Project approach has helped to provide an eco-friendly solution to community water and sanitation. In this regard, WaterAid in Nepal's idea of integrating all the components to initiate the community based water resource management concept has been implemented in this project.

Considering the undue strain on the resources and services, the concepts of recycling, (water and wastewater and solid waste), regeneration, recovery of wastelands and encroached areas, recharging ground water table and rejuvenation of rivers and water bodies are all essential for long term environmental sustainability.

Rainwater harvesting techniques have been used throughout the Kirtipur Housing Project to ensure alternate water supply facilities. In addition to domestic use, rainwater is also being used to recharge ground water through the use of recharge pits to help address the issue of water depletion caused by water extraction from the community wells. Similarly, open space developed for the community courtyard in the middle of the houses, which were arranged rhythmically with blue corrugated galvanized iron sheets, has been placed strategically to infiltrate the harvested rainwater for ground water recharging purpose and to make the people feel the importance of greenery as well.

The increase in use of concrete in cities and streets has led to the drying up of wells and traditional water sources resulting in acute water shortage. The Kirtipur Housing Project is an example of how this problem can be addressed.

In addition, the Kirtipur Housing Project also incorporates solid and liquid waste recycling, recovery and reuse mechanisms. Liquid waste will be recycled and reused once it is treated through a decentralized wastewater reed bed treatment plant the construction of which is completed as per the master plan of the Kirtipur Housing Project with WaterAid in Nepal's support. However, the plant is still under the observation for monitoring its treatment efficiency.

The Kirtipur Housing Project also acknowledges the consciousness of the people towards the surrounding environment, water scarcity and possible impacts on their health due to poor environmental sanitation within their dwellings. Hence, all the dwellers of the Kirtipur Housing Project were made aware of solid waste management systems at the household and community levels. Training was provided on collecting and managing solid wastes, including composting techniques. Similarly, possible ways of recycling and reusing the solid waste were disseminated through demonstrations with an indication of potential benefits and livelihood opportunities that can be reaped through effective waste management. As an outcome of this awareness on waste management, kitchen waste composting has made it possible to retrieve the nutrients in the waste to recycle them back to the soil.

In addition to practicing effective waste management, people were also made aware of water optimisation concepts and the issue of water quality. In this context, people were made aware of the various options for water optimisation techniques through value based water education and water treatment techniques that can be practiced at the household level, which in general terms are called point of use treatment mechanisms. Popular point of use options, including Solar Disinfection System (SODIS), chlorine liquid (PIYUSH) and bio-sand filter, have been promoted for treating rainwater, groundwater and piped water before consumption.

Water management

250 people reside in 44 houses and they require 5m³ per day. There is a 40m³ storage tank to supply water for the people residing in this eco-community. The water is supplied from various sources (such as rainwater, ground water and piped water supply). Three underground storage tanks with cumulative capacity of 40m³ were constructed for storing harvested rainwater. 767m³ rainwater is being harvested annually from these 44 housing units. Only one side of the roof of 29 houses is currently being used and around 165m³ of rainwater can further be harvested from the other side of these houses. All these tanks have been installed with handpumps for easy access to water.

In addition to the rainwater harvesting initiative, two dug wells were constructed to provide water facilities to the people. The iron removal plant and water filter were

installed to provide safe water. During the dry season, the people have decided to distribute two buckets of filtered water for drinking when there is a shortage of water, and use other sources for other different purposes.

As the potential of rainwater harvesting exceeds the storage capacity, any surplus rainwater will be used for ground water recharging by diverting it to the recharge pits. These recharge pits allow water to percolate into the ground water aquifers.

In addition to these sources, people are also using piped water supply from tap stands located in the neighboring community, but have to face difficulties as the tap stand is located more than 10 minutes away from the community on one hand and on the other this community of evicted families are given less priority in getting water from the tap stand. Thus, realizing the need for city water supply, particularly during the dry season, efforts are underway both from the community and Lumanti to get access to piped water facilities from the Kirtipur Municipality.

Wastewater management

Realizing that wastewater management is one of the major problems of Nepal, the Kirtipur Housing Project adopted a low cost, natural treatment option, a reed bed treatment system constructed at an area of 192 m². Technologically, a reed bed treatment system or constructed wetland is an ecologically balanced system using low energy and a low cost alternative and natural process for the removal of undesirable nutrients from the municipal wastewater.

The wastewater which is generated within this community at the rate of 26m³/day is treated by three chambered septic tank with a soak pit system. The effluent from this is further treated by a constructed wetland system through two horizontal flow beds with a net wetland area of 107.1m² to improve the quality of the effluent and thus to enhance the possibilities of reusing and recycling this treated, rich, nutrient filled effluent either by the community for cleaning, gardening and flushing purposes or by the neighborhood farmers for watering agricultural land. However, discussions with the neighborhoods are underway to reuse the treated wastewater for irrigating their farmlands thereby using the high mineral composition and organic nutrients contained in it for enhancing crop productivity. Once this initiative is underway, this will further lay one step towards the community based water resource management initiative.

This constructed wetland is completed as mentioned but is not yet put into full operation as the plant is still under the observation for monitoring its treatment efficiency to assure the adherence of the treated effluent with national effluent standards. After regular monitoring the quality of the effluent to ensure successful operation of the plant, the community will be managing the plant.

The community was already trained for this and will also be trained once the entire management responsibilities of this treatment plant are handed over to them. The

community has initiated to take over the responsibility of the operation and maintenance of the plant; also created an operation and maintenance fund; and developed a policy for contributing to this fund. At the beginning, the community started to contribute NRs. 15/month/household and planned to increase the contribution gradually based on the requirement and affordability of the community.

Giving due consideration to this initiation of the community, it shows the community's ownership of the Kirtipur Housing Project and its infrastructure components to make them operate effectively, efficiently and sustainably in the long run.

A way forward

The Kirtipur Housing Project has provided shelter to the displaced families in Kathmandu and although it looks like any other low cost housing colony from the outside, its unique features have generated increased interests. Its eco-friendly architecture, sustainable water resource management and management of potential polluting wastes have fulfilled the objectives of the project.

The Kirtipur Housing Project aimed at the urban poor has not only brought the community based water resource management concept forward but also opened up avenues for sustainable alternative solutions for managing water crisis as well as generated municipal wastewater through effective community based water resource management putting all the possibilities and potentialities together into a single platform called eco-community. The Kirtipur Housing Project has now become an inspiration for providing ecologically sustainable design solutions in a broader context.

The Kirtipur Housing Project, a first kind in urban metropolitan cities of Nepal, is an example not only from the community based water resource management perspective but also from the point of resettlement of evicted urban slums thereby eradicating the psychological burdens of being identified as slums and squatters and providing an opportunity to live a dignified life.



WaterAid's mission is to overcome poverty by enabling the world's poorest people to gain access to safe water, sanitation and hygiene education.

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