

Urban sprawl in southern Thimphu, Bhutan. The green and resilient affordable housing sector project is aligned with the government's National Housing Policy, 2020, and its commitment to enhancing the standard of housing and public spaces (photo by Jude Kohlhasse).

MAY 2023 | No. 4

Green and Resilient Affordable Housing Sector Project

Setting the Scene: The Innovation Opportunity

Having an adequate and secure home to call your own is an elusive dream for many people, especially urban poor people. All the ingredients needed for a home—from land and municipal services to construction materials and housing finance—have not kept up with demand. Prices have inevitably skyrocketed, especially in urban areas, pushing home ownership out of the reach of many. This is true for many in Bhutan. Currently, about 31% of urban households still share their accommodation with one or more other households. Housing loans are the most common household debt.

The housing gap is in part due to the country's rapid urbanization. Bhutan's urban population has nearly doubled over the past 2 decades with 42% of the total populace living in urban areas and increasing by 2.7% annually. People have been migrating into urban areas, leaving many vacant houses in the provinces and crowding out already congested residential sites in pursuit of employment, education, and other opportunities. The housing deficit in urban Bhutan continues to rise at an alarming rate; just before the coronavirus disease (COVID-19) pandemic, it was estimated at over 21,000 units nationwide, while the country has a population of about 800,000.

What the Asian Development Bank Did: Innovation in Action

Given the high and still rising demand for affordable housing in urban Bhutan, the government prioritized it in its Twelfth Five-Year Plan 2018–2023 and National Housing Policy (NHP) in 2020. The NHP aims to provide secure, safe, affordable, and adequate rental housing for all, promote home ownership, encourage public–private partnerships, improve the governance system, and integrate green and energy-efficient features. It also includes policies that streamline land-use zoning to increase land supply and provide tax incentives to banks and the private sector that offer housing finance.

To reach these goals, the government initiated a housing program that intends to supply 2,500 affordable rental housing units to poor beneficiaries. Most of the beneficiaries are low-income civil servants, municipal waste workers, single parents, people with disabilities, and single female-headed households. The Asian Development Bank (ADB) is supporting this program through the Green and Resilient Affordable Housing Sector Project, which will build 1,000 of the planned housing units.

SOUTH ASIA INNOVATION PROJECT BRIEF NO. 4

The project will not only provide homes for low-income groups and the marginalized, but will also provide three community centers, two recycling waste stations, and green spaces that help create vibrant communities. The affordable residential buildings for Bhutan's urban poor people will feature a modern, disaster-resilient, and energy-efficient design that also reflects local culture and traditional architecture.

Key Innovations

Value for money

The housing units are meant for lower- to middle-income government and private sector employees, including low-income municipal waste workers. The units are intentionally designed to reduce construction costs with rental prices that are lower than what beneficiaries currently may be paying, i.e., up to 41% of their monthly household incomes to rent a house with a floor (carpet) area of 69 square meters. Under the project, beneficiaries will be paying between 16%–29% of their income for a house of the same size. In addition, these new houses supported by the project will be on sites that offer better services and amenities, such as street lighting, sanitation, open spaces, and facilities for people with disabilities.

Disaster-resilience

Bhutan is vulnerable to various types of disasters. It is a mountainous country prone to earthquakes, floods, landslides, forest fires, and other hazards. To ensure resilience against these calamities, the planned residential buildings will be built with reinforced concrete frames and innovative pre-engineered structures that can withstand multiple hazards and go beyond existing building code designs. To mitigate against landslides, slope benching and structural relocation have been considered. Retaining walls as well as stormwater drains will be built into the project site and into the residential buildings to mitigate the impact of heavy rainfall and floods. The buildings have also been engineered to facilitate quick evacuation in case of emergencies.

Since Bhutan is highly vulnerable to earthquakes, the project is introducing innovative evidence-based seismic risk mitigation through structural designs that accommodate the potential for collapse. It is also undertaking detailed geotechnical and foundation investigations. All these constitute best practices that can be replicated in other earthquake-prone areas.

The project has also reviewed building design practices in line with the latest scientific assessments of seismic hazards. The review showed that national building code and regulations can be significantly augmented to match the high level of risk.

Building with nature

The project aspires to develop the first green-certified buildings in the country. Residential buildings are designed to be cost- and energy-efficient. The sites are situated in subtropical climate zones and the new housing units adapt to nature in consideration of the climate. For example, the walls and windows in Thimphu and Trashiyangtse were designed for thermal efficiency as they are located in temperate climate zones. In contrast, the planned residential buildings in Phuentsholing, Nganglam, and Samdrup Jongkhar will have windows designed for efficient ventilation for cooling and screen protection against insects. All buildings will be equipped with energy- and water-saving devices. They will use low-emission diode lamps to save energy and integrate rainwater harvesting. The project is guided by the Excellence in Design for Greater Efficiency (EDGE) app,¹ which can reduce the use of energy, water, and embodied energy in building materials by a minimum of 20%. This will bring down the beneficiaries' monthly energy bills.

The project was approved in December 2021. While construction of the residential buildings and the integrated community centers has not yet started, the detailed designs have been completed in some areas, and construction is expected to begin by mid-2023. The project aims to finish the construction of all 1,000 housing units by 2027.

Innovation Takeaways

Responsive housing program

This project addressed the challenges experienced by urban poor people by integrating features into the residential buildings that directly respond to the identified barriers to decent and affordable housing in urban Bhutan. These features specifically address not only beneficiaries' capacity to pay, but also climate change readiness, disaster resilience, gender and social inclusion, and even culture and tradition.

Gender and social inclusion

Bhutan strives to improve gender equality, especially for women in urban settings. Women are still underrepresented in decision-making activities in urban planning and community management of urban services. The project recognizes the need to involve women in the planning process. It will encourage women's participation throughout project implementation, with gender equality and social inclusion features such as preferential employment of women laborers in construction with equal pay for equal work and at least 30% of the units being allotted to female members.

¹ EDGE is a web-based app that identifies the most cost-effective ways to reduce the resource intensity of a building. It was created by the International Finance Corporation, a member of the World Bank Group.

Women will be included in awareness programs on gender-based violence, solid waste management, water conservation, preparedness to respond to and cope with the immediate and long-term effects of disaster, and COVID-19 standard operating procedures. They will also be included in the operation and maintenance and asset management of housing and community center facilities.

The housing units will provide women with adequate space, facilities, and lighting, including access to water and sanitation for home-based income-generating activities. Civil society organizations will support the effective implementation of the project and address gender inequalities.

Voices from the Field

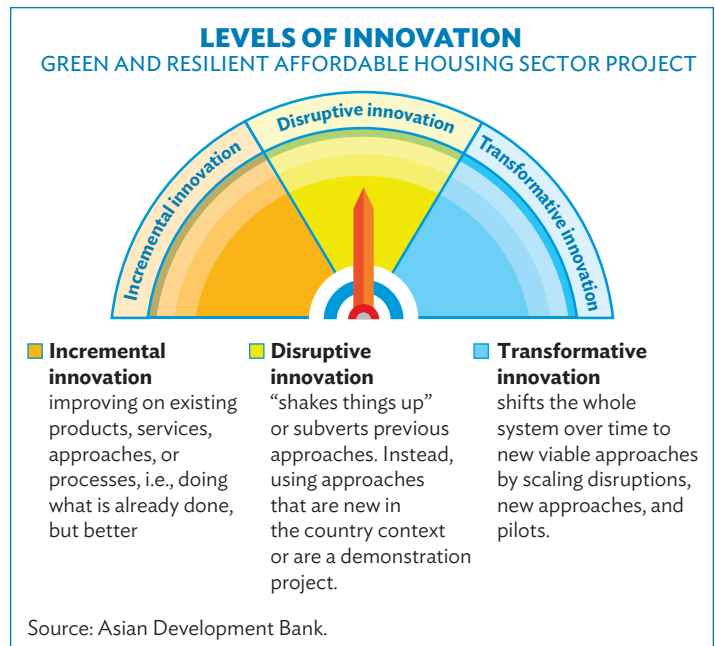
“My family benefited from NHDCL’s [National Housing Development Corporation Limited’s] housing units since we moved to Thimphu in 2010. The rent is affordable, and my husband and I are now in a position to take ownership in a matter of 3 years.”

“Finding affordable housing for many families seems improbable, but that won’t be the case when new rental housing is constructed under the NHDCL project.”

Pema Choki



Residents of NHDCL’s homeownership scheme. Pema Choki (right), with her mother, meeting with the ADB mission in Changji, Thimphu, Bhutan (photo by Jude Kohlhase).



Preserving culture and tradition

Despite its rapid urbanization, Bhutan has been adept at preserving its culture and tradition. One of the ways it does this is by ensuring that the design of its infrastructure strictly adheres to a set of standard architectural guidelines. These guidelines stipulate using local natural core construction materials such as earth, stone, and timber. They also require the preservation of elements of Bhutan architecture such as the intricate design and woodwork of roofs and windows, the use of stone and rammed earth, and multicolored wood facades. These distinct elements reflect Bhutan’s rich cultural heritage.

Faces of Impact: Jude Kohlhase and Saswati Belliappa

Q: What makes this project genuinely responsive to these beneficiaries?

A: “The project supports low-income individuals and families who have a monthly income of less than Nu26,870 (about \$350). It is open to civil and non-civil servants, and municipal waste workers,” ADB project officer Jude Kohlhase says. “The project beneficiary selection and eligibility criteria prioritize vulnerable households, such as single parents, female-headed households, families living with people with disabilities, or those living in temporary shelters, such as Bhutanese living in India commuting to Bhutan for work.”

Q: Who are the stakeholders of the project? How are they being prepared/capacitated to implement/oversee the project?

A: The project implementing agency is the National Housing Development Corporation Limited (NHDCL), which is leading the development of new and affordable rental homes in line with the NHP. ADB project officer Saswati Ghosh Belliappa

INNOVATION AREAS		
GREEN AND RESILIENT AFFORDABLE HOUSING SECTOR PROJECT		
AREA	INNOVATION	THIS PROJECT
 FINANCING	Innovative financial products that help developing member countries finance complex projects and programs	
 TECHNICAL DESIGN	Innovative technical solutions that improve sustainability, efficiency, and effectiveness	
 IMPLEMENTATION	Innovative implementation design that helps to overcome bottlenecks in institutional capacity or governance	
 PARTNERSHIPS	Value-adding partnerships and collaborations that bring enhanced knowledge and skills	
 ADB'S INTERNAL PROCESS	Innovative processes that make ADB more efficient and effective	

ADB = Asian Development Bank.
Source: Asian Development Bank.

said that NHDCL’s project management unit has now been familiarized with the principles of green building and analysis during the design stage for each potential location. “The project team conducts regular meetings and consultations that assist stakeholders in assessing housing policies and developing resilient building designs,” Belliapa added.

Q: The project is in its initial stages. What challenges do you think can hinder the project’s success? How can they be addressed?

A: Both project officers emphasized that the design and construction stages are vital to the project’s success. It is important for NHDCL to ensure green building pre-certification requirements are met, e.g., specifications are aligned with the rating system. Technical support is another crucial element, and consultants have been hired to supplement NHDCL resources; help achieve the overall project impact, outcome, and outputs; and ensure the program can be easily replicated. Pursuing ambitious objectives through a single operation in a country can lead to unsatisfactory results; therefore, Kohlhase said, “support should be sustained with ongoing technical assistance for the development of institutional capacities, even long after the project closes.” Belliappa added, “Results should be regularly measured and monitored for NHDCL to consistently learn from experience and improve how Bhutan is meeting its housing challenge.”

Jude Kohlhase is unit head, project administration of South Asia Department (SARD); Saswati Belliappa, is senior safeguards specialist (SARD). Charlene Liau, urban development specialist (SARD) is the current project officer of the Green and Resilient Affordable Housing Sector Project.

South Asia Innovation Project Brief Series captures and disseminates knowledge on innovation embedded in ADB’s operations in South Asia. This series promotes cross-project learning, improves project design and implementation, strengthens the understanding of innovation needs and trends, and enhances development effectiveness of ongoing and future projects and south-south knowledge cooperation. The South Asia Department administers the series. Please contact SARDKM@adb.org.

<https://www.adb.org/publications/series/south-asia-innovation-project-briefs>

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1500 Metro Manila, Philippines
Tel +63 2 8632 4444
Fax +63 2 8636 2444



© 2023 ADB.
The CC license does not apply to non-ADB copyright materials in this publication.

<https://www.adb.org/terms-use#openaccess>
<http://www.adb.org/publications/corrigenda>
pubsmarketing@adb.org

ISBN 978-92-9270-164-2 (print)
ISBN 978-92-9270-165-9 (electronic)
Publication Stock No. BRF230190-2
DOI: <http://dx.doi.org/10.22617/BRF230190-2>