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Participatory Resilient Housing Construction in Cambodia

Submitted By: UN-Habitat Cambodia



Organization Profile

Organization Name: United Nations Human Settlements Programme (UN-Habitat) Cambodia Office

Organization Type: United Nations entity

Website: https://fukuoka.unhabitat.org/en/tag/cambodia/

Practice Details

Country(ies): Cambodia

City(ies): Kep province and Prey Nob district in Preah Sihanouk Province

Start Year: 2021 **Ongoing:** Yes **End Year:** N/A

Main Adequate Housing Components:



Housing Thematic Areas:

Housing Affordability & Financing

Housing & Climate Adaptation

Relevant SDGs:



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Problem & Context

In Kep and Preah Sihanouk Provinces in Cambodia, poor and marginalized households tend to be less resilient and disproportionately affected by natural disasters, lacking the resources and capacity to cope, recover, or adapt.

Both Kep and Preh Sihanouk Provinces are located in the lowland close to the sea and make poor households sensitive to seasonal storm surges, floods, and seawater intrusion. The poor live in houses with below minimum standards in terms of structure, materials, and thermal comfort to protect residents from climate hazards, and limited vegetation/greenery for shading and the evapotranspiration process necessary to make the settlement environmentally safe.

The stakeholder consultation during the project development phase identified that up to 80% of housing was damaged by strong winds annually. People also suffered from extreme heat and frequent flooding.

Solution Developed

The project aimed to develop practical and climate-resilient house designs and construct demonstration homes for future replication by using local labour and materials.

After constructing eight houses, the donor approved to reallocate the untouched budget to construct 19 more houses. Thus, the resilient housing expert conducted field assessments and consultations to improve the housing designs and cost estimations. As a result, the project teams tailored the homes to local climate and site conditions. They focused their innovations on affordability, energy efficiency, and eco-friendliness. Compared to traditional houses, the new design features elevated reinforced foundations for flood resilience, strong beams, anti-heat roofing to reduce indoor temperatures, and solar panels for an off-grid energy supply. Other features — rainwater harvesting tanks, ventilation systems, and disability- friendly handrails — ensured houses were inclusive, environmentally responsive, and future-proofed for extreme weather conditions.

This intervention aimed to benefit 27 vulnerable households, approximately 135 people, who were selected based on the criteria, such as the government's Poor ID levels.

Implementation

The project team implemented the intervention in two phases to ensure long-term ecological and community resilience. When the eight houses in the first phase were constructed in April 2024, based on the donor's approval to construct 19 more houses, the project conducted a technical assessment with the Resilient Housing Expert to improve the designs and cost estimates in September. After the approval of the Project Management Committee on the improved design and cost estimation, the project started the construction of 19 houses. As of

August 2025, 20 houses were constructed, and seven more houses will be completed in October 2025.

During the construction, the Resilient Housing Expert provided daily technical guidance and monitoring to the subcontractors and labours. The Ministry of Environment, the implementing partner, is responsible for the regular monitoring and on-the-job training.

The intervention emphasized capacity-building for unskilled and semi-skilled local laborers, equipping them with construction techniques tailored to climate-resilient structures, which are resilient to strong winds and extreme heat. Trainees were also involved in the construction work and could be part of a skilled local workforce for future resilient construction projects. This participatory climate-resilient housing construction process is effective in improving local capacity, livelihood diversification, and showcasing climate-resilient housing.

Enablers & Obstacles

The project delivered cost-effective, climate-resilient housing by utilizing local materials, traditional techniques, and community-based labor. Engaging local construction companies reduced costs and supported the local economy. Pre-construction capacity-building for unskilled and semi-skilled residents equipped them with resilient building skills, providing income through on-the-job training and enhancing long-term livelihood opportunities.

Despite setting gender equity targets, the project experienced less female participation than desired during training and construction. The 50 per cent target for female involvement proved highly ambitious. Cultural norms, traditional gender roles, limited experience, safety concerns, and childcare responsibilities all contributed to this gap. These factors reduced the intervention's overall inclusivity, highlighting the challenge of achieving gender parity in traditionally male-dominated sectors.

Results & Impact

The intervention minimized the risk of financial burdens of 27 vulnerable households repairing damaged houses due to annual natural hazards. Resilient housing provided the beneficiaries with a very comfortable living environment without fear of heatstroke, roof damage from strong winds, rain, or flooding. They can save on repair costs and invest in other needs.

The project also indirectly benefited approximately 9,680 people through knowledge transfer and exposure to improved construction practices. The project created jobs for unskilled and semi-skilled labourers from the local community, many of whom were women and youth. They received practical on-the-job training and earned income during the construction period. Some were family members of beneficiary households, strengthening local engagement, social equity, and the long-term sustainability of the housing intervention. Nam Hum, a female labourer, said: “I am a farmer without other livelihood options. After the training, I can work as a construction

worker. My experience and skills from this project will allow me to work on other construction sites in the future. It's a new income source that I can rely on."

Capacity-building of local labour and the participatory construction of demonstration houses have strengthened community awareness of climate-resilient housing. The use of locally available materials and skills in housing design promotes ownership and increases the potential for replication and upscaling.

Replication & Scale Up

With Adaptation Fund support, UN-Habitat has been implementing a new climate adaptation project in two other coastal provinces since 2024. 60 resilient houses for vulnerable households will be constructed.

With a partnership with external stakeholders, including the General Department of Housing, UN-Habitat shared the project's experiences to create the Affordable Housing Guidelines for Cambodia. We also organized a knowledge-sharing activity for relevant government officials and NGOs to share experiences to promote the replication of resilient housing in other climate-vulnerable areas.

The project is summarizing resilient housing designs and construction techniques as the Resilient Housing Building Manual in the local language to ensure sustainability and scaling up of successful climate-resilient housing construction. The project will also create a report capturing the implementation process, best practices, challenges, and key recommendations emerging from this intervention to inform future projects focused on climate-resilient housing. It will be disseminated through a combination of communication channels, including print media, social platforms, and workshops

Policy Uptake

This housing practice has informed or been partially integrated into policy discussions, strategies, or pilot-level policy instruments.

The project has been preparing policy recommendations to offer actionable insights to scale-up implementation of affordable housing, integrating sanitation and renewable energy in the climate-vulnerable settlements in Cambodia. The primary audience includes national and sub-national authorities responsible for action-taking.

The project's experiences were also reflected in the updated Nationally Determined Contributions (NDC 3.0) of Cambodia to build 4,000 climate-resilient houses for low-income households and integrate resilient housing design into the national building permit system.

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Lessons & Takeaways

There were two key lessons/takeaways.

1. The demonstration homes were seen as high-quality but expensive for average low-income families to replicate without subsidies. To support future scalability, cost-saving options should be explored — for example, substituting high-specification materials with local alternatives for sanitation and flooring.
2. Dedicated strategies should be implemented to promote gender balance in technical roles. These may include tailored training modules for women, flexible work shifts, and access to childcare to encourage participation.