

# Recovering Sustainable Settlements for People Affected by Disaster: An Inclusive-Participatory Approach

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**Abstract:** Typhoon Damrey struck Vietnam in November 2017 and was the strongest storm to hit the country in over 15 years. It impacted 13 central coastal provinces. Many domestic and international organisations provided timely support to affected populations. These projects were successful in recovering settlements and rebuilding houses for affected people through the application of a participatory-inclusive approach. This paper evaluates the restoration of settlements and rebuilding of homes in international projects using a participatory approach. The Active Learning Network for Accountability and Performance guide to the Development Assistance Committee criteria in Evaluations of Humanitarian Action was used to assess the relevance, effectiveness, efficiency, impact, sustainability and replicability. Data collection included desk-based research and semi-structured interviews with stakeholders from central to local authorities and beneficiary communities. The results showed that a transformation towards a participatory bottom-up approach is crucial for effective recovery and rebuilding efforts.

**Keywords:** Life recovery; inclusive-participatory approach; resilient housing; sustainable settlements; disasters.

## 1 Introduction

Vietnam is a coastal country frequently hit by natural hazards, such as storms, floods, coastal landslides, saltwater intrusion, and droughts. These affect cities, economic sectors, and coastal infrastructure systems and impact residential communities, causing them to lose their homes, assets, and livelihoods [1] [2] [3]. In response, authorities at different levels in Vietnam have paid great attention to the prevention and control of disasters and support for disaster recovery.

### 1.1. Disaster Prevention Strategies

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Several legal documents have been issued in Vietnam regarding solutions to respond to disasters, risk management, and support recovery after a disaster. For example, Law No. 33/2013/QH13 on Prevention and Control to Disaster [4], later replaced by a consolidated document No. 04/2020/VBHN-VPQH, regulate the activities of organisations and households to prevent and resist disaster and resource contribution [5]. In 2021, Decision No. 379/2021/QD-TTg on the National Strategy for Natural Disaster Prevention and Control to 2030, vision to 2050 outlined new perspectives [6]. This decision emphasises proactiveness at the locality, promoting social resources in disaster prevention, application of advanced technology, and international co-operation. The strategy also states that the disaster prevention process consists of three stages prevention, response, and remediation, in which proactive prevention is the main focus [6].

## **1.2. The role of Inclusive Development**

Despite the regulations on preventing disasters, the restoration of settlements and reconstruction after disasters is still lacking [1]. The implementation mechanism currently does not consider the engagement of many stakeholders, limiting the appeal for resources and not calling for responsibility and contributions from the community. Recovering settlements, rebuilding houses and service systems, as well as creating livelihoods for affected people after disasters, is complicated and requires the contribution hand-in-hand of stakeholders [7].

## **1.3. Legal Framework for Disaster Preparedness and Prevention in Vietnam**

Vietnam has made significant progress in developing a legal framework for disaster preparedness and prevention. Law No. 33/2013/QH13 on Prevention and Resistance to Disaster, later replaced by a consolidated document No. 04/2020/VBHN-VPQH regulates the activities of organisations and households to prevent and control disaster and resource contribution. The law emphasises the need for proactive prevention, timely response, and effective remediation. It also highlights the importance of community participation and international co-operation in disaster risk reduction [4] [5].

In 2021, Decision No. 379/2021/QD-TTg on the National Strategy for Natural Disaster Prevention and Control to 2030, vision to 2050 outlined new perspectives [6]. This decision emphasises proactiveness in the locality, under the motto "*four-on-the spot*," which means local people should actively participate in disaster prevention and preparedness. The strategy also emphasises promoting social resources in disaster prevention, applying advanced technology, and international co-operation [6].

In addition, Vietnam has issued several legislation documents to support disaster-affected populations, including Decree No. 2/2017/ND-CP on mechanisms and policies to support agricultural production to restore production in areas affected by disasters and epidemics [8] and Decree No. 50/2020/ND-CP on receiving, management and use of international emergency assistance for disaster relief and recovery [9]. However, regulations are still lacking concerning the restoration of settlements and reconstruction after disasters. The Ministry of Construction has issued technical guidelines for repairing and minimising damages to houses or buildings caused by wind and storms [10] [11]. A handbook also regulates housing design models to withstand storms and floods. On that basis, localities consult and guide local people to construct their houses. Nonetheless, to apply these models in reality, it is necessary to have adjustments that agree with the variety of natural conditions and local lifestyle characteristics [12].

#### **1.4. Challenges in Implementing Restoration and Reconstruction**

Although restoration and reconstruction after disasters have been mentioned in legislative documents at the central government, it seems insufficient at the local level [1]. This sometimes causes difficulties for local authorities to implement proactively, call for funding resources, and to create participatory mechanisms for reconstruction. In addition, the state budget to support impacted people is always too small to supply sufficiently, especially if the affected area is too large to cover several provinces [13].

Moreover, the implementation mechanism does not consider the engagement of many stakeholders, limiting the appeal for resources and not calling for responsibility and contributions from the community. Recovering settlements, rebuilding houses and service systems, and creating livelihoods for affected people after disasters, are complicated and require the hand-in-hand assistance of stakeholders, from state organisations, businesses, and unions, to residential communities [7].

#### **1.5. Participatory and Inclusive Development Approach**

The participatory-inclusive development approach has gained attention from international organisations and aims to create a livable, sustainable environment and equality [14]. The United Nations Human Settlements Programme (UN-Habitat) studied urban areas and proposed that an inclusive city is a sustainable model of promoting growth with equity. Participatory planning and decision-making are the heart of the inclusive city [15]. The Asian Development Bank (ADB) expanded the definition of an inclusive city as *“An inclusive city creates a safe, livable environment with affordable and equitable access to urban services, social services, and livelihood opportunities for all the city residents and other city users to promote optimal development of its human capital and ensure the respect of human dignity and equality”* [16]. An integrated approach is a transformative method for implementing inclusive development. It encourages stakeholders and institutions to work together to deliver inclusive urban services [17]. This approach includes sustainable, resilient, accessible and affordable solutions to challenges faced by urban poor and vulnerable groups [18].

#### **1.6. Impact of Typhoon Damrey and Recovery Efforts**

In November 2017, Typhoon Damrey struck Vietnam, the strongest storm to hit the country in over 15 years. It impacted 13 central coastal provinces and directly affected about 4.3 million people. Approximately 300,000 houses were damaged, including 3,550 that were destroyed. The most affected areas were in the South-Central region, where the death toll reached 110 people, with 16 missing and 197 injured (as of November 17th, 2017) [1] [19]. At the request of the Vietnamese government, many domestic and international organisations provided timely support to affected populations. In addition, some international organisations actively worked in affected provinces on house repair and rebuilding efforts, such as the United Nations Development Programme (UNDP). These projects were appreciated by authorities and communities for their effective implementation and successful outcomes in recovering settlements and rebuilding houses through a participatory-inclusive approach [20].

#### **1.7. Evaluation of International Funding Projects for Typhoon Damrey Recovery**

This section presents an evaluation study of international funding projects to restore settlements and rebuild houses for households severely impacted by Typhoon Damrey in south-central coastal provinces. The study utilised the Active Learning Network for Accountability and Performance guide for using the Development Assistance Committee criteria in Evaluations of Humanitarian Action to assess the process's relevance, effectiveness, efficiency, impact, sustainability, and replicability [21]. Data collection included desk-based research, semi-structured interviews with stakeholders from central to local authorities and beneficiary communities, and in-depth surveys of 18 households out of 300 beneficiary families in the three provinces [12].

The study's findings revealed that a transformation towards a participatory bottom-up approach is crucial for effective recovery and rebuilding efforts. This approach mobilised the strengths and contributions of stakeholders, fostered community engagement, and reinforced social linkages among people in creating a sustainable living environment. Additionally, the use of information technology in implementation promotes transparency and efficiency, contributing to the construction of high-quality housing.

These results can be replicated in other cases and can support policy and guideline development for life recovery and rebuilding houses after disasters. In addition, the study's findings can spread techniques of sustainable design within communities, promoting the long-term sustainability of the built environment.

The findings of this study can serve as a helpful guide for replicating successful approaches in similar cases, as well as supporting the development of policies and guidelines for life recovery and house rebuilding after disasters. Additionally, the study's results can help spread sustainable design techniques within communities.

## **2 Methods**

### **2.1 Study Area**

The study area covers three provinces in the south-central coastal region that Typhoon Damrey strongly impacted in 2017: Khanh Hoa, Phu Yen and Quang Nam. Data was collected from over three hundred households with the support of local VNRC and WU organisations. Eighteen households were surveyed and interviewed in depth. Typhoons most seriously impacted these poor and vulnerable households.

### **2.2 Study approach**

The Organization for Economic Co-operation and Development Assistance Committee (OECD/DAC) criteria were used to evaluate the recovery and rebuilding of storm-affected houses. The five DAC evaluation areas are relevance, effectiveness, efficiency, impact and sustainability and replicability [21]. Additionally, aspects of green housing were also considered, such as using recycled or local materials, low-cost design and innovative technologies and approaches [22].

Participatory and collaborative approaches were effectively applied to collect opinions as diversified inputs for the evaluation. Primary stakeholders were key cooperators during the exchange of knowledge and experiences, which provided rich and relevant documentation for research. In addition, close collaboration was established with project staff, donors, local social organisations such as the Vietnam Red Cross Society in Khanh Hoa and Quang Nam and Vietnam Women's Union in Phu Yen, the Department of Constructions in three provinces as well as masons, contractors and people.

A desk review was conducted to study national strategies, policies, legislation and programs at the national, regional and local levels. Lessons learned from global green recovery efforts and safe, resilient housing were referenced during the evaluation process. In addition, housing design options used in three provinces were reviewed and technically assessed, along with collecting opinions from local people about their relevance in terms of form, structure and cost.

Data collection was determined to be the best approach for obtaining credible information from multiple stakeholders. Using the five DAC evaluation criteria as a guide, key informant semi-structured interviews were conducted with state officials (DoC, PsC), NGO staff such as those from UNDP and UN-HABITAT and political-socio associations at provincial, district and commune levels such as VNRC and WU branches. A strong emphasis was placed on meeting beneficiary households and their neighbours to gather viewpoints on new homes and repaired houses based on the five targeted areas. Focusing on eighteen beneficiary households in three provinces, discussions with people of various ages and genders provided rich opinions relevant to homes and access to support funds. Data collection was extended to hundreds of affected households in three provinces with assistance from local authorities and associations.

### **3 Results and Discussion**

#### **3.1 Effective Interconnection of Stakeholders through Participatory Approach in Reconstruction**

Effective participation and close cooperation among stakeholders were observed in rebuilding and recovering settlements for storm-affected households in three provinces. The government played a role at the national level by promulgating critical legal documents that provided a basis for domestic and international organisations to support affected people. In the construction area, safer flood/storm-resilient housing designs approved by the Ministry of Construction were deployed in provinces and adjusted to local contexts under the responsibility of Provincial Departments of Construction (DoC), which also played an essential role in technically monitoring eight safer designs developed by the Ministry of Construction (MoC) and DoCs. International organisations funded projects based on these documents for deployment in reality. Additionally, the Provincial Department of Labour, Social Affairs and Invalids played a role in carefully identifying and selecting vulnerable families who were strongly impacted and needed support to ensure deserving choices were made. The Social Policy Bank worked with local project partners to efficiently, flexibly, safely and transparently send payments to beneficiary households in a time-saving manner.

#### **3.2 Role of Project Implementing Agencies and Donor Organizations**

Project Implementing Agencies played an essential role as a crucial link between national and local authorities and in securing financial support packages from donors. Prominent organisations included UNDP and the French organisation Development Workshop France (DWF) [12]. These organisations worked with state agencies to support program design and project deployment. Notably, the UNDP Vietnam Country Office supported the Government of Vietnam in designing and implementing a complex \$1M housing recovery initiative to strengthen government capacity at national and sub-national levels to lead and manage early recovery efforts in the three worst-affected provinces [12]. In addition, the UNDP in Vietnam worked closely with project partners called Executing Agencies, who were responsible for directly supervising and monitoring projects. These included the

Vietnam Red Cross Society (VNRC), Vietnam Women's Union (VWU) and Vietnam Fatherland Front in some other projects.

### **3.3 Role of Executing Agencies and Local Contractors**

Executing Agencies operated at provincial, district and commune levels. In the UNDP project, trained staff from VNRC and VWU worked effectively and efficiently with beneficiary households in Khanh Hoa, Quang Nam and Phu Yen. They were responsible for monitoring, supervising, and supporting local artisans and beneficiary households. The process included many steps and specific activities that indicated the roles and responsibilities of different stakeholders.

Local contractors, masons and artisans directly reconstructed houses in coordination with households. In addition, the project (UNDP) hired three construction supervision engineers, one for each province to oversee the technical monitoring of house construction.

### **3.4 “Nobody Left Behind”: The Sustainable Social Aspect of the Inclusive Approach**

Beneficiary households were selected from poor and near-poor vulnerable households, including older people, people with disabilities, single women-headed households, families with a shortage of labour or in exceptional circumstances. This was achieved through close collaboration between project partners and the Department of Labour, Social Affairs and Invalids at sub-national levels to identify deserving choices. The selection process was exceptionally challenging but was conducted in an open, fair, and transparent manner. About 10% of the total number of homes destroyed in the three worst-affected provinces (304/3,041 houses) were addressed, with a greater focus on homes that faced >70% damage. This ensured assistance to poor and near-poor households most deserving of support. House reconstruction addressed the needs of different groups, including women, men, children, older people and people with disabilities. Cross-cutting issues were mainstreamed into project plans with a specific emphasis on gender differentiation to provide tailored assistance to particularly vulnerable households.

### **3.5 Flexible Payment and Livelihood Recovery for Beneficiaries**

Beneficiary households had easy access to flexible payment methods in different provinces, such as cash or cheque, with support from project partners and the Social Policy Bank. For example, in Phu Yen, instead of issuing cheques, the VWU provided support to households as cash at commune-level bank branches. This allowed poor households to feel respected as they could access innovative payment methods like others in society. All homeowners interviewed said this acted as a trigger for families to strive for something much bigger and costlier of modern living that they may not have had access to before.

Provincial project partners also addressed recovering livelihoods for beneficiaries. The provincial Red Cross branch in Khanh Hoa and the provincial Women's Union branch in Phu Yen were each provided with a grant of US\$5,000 per province to set up a revolving fund [12]. So far, six beneficiary households in Khanh Hoa and five in Phu Yen have received VND18M to 20M each for rebuilding or repairing their homes. Although currently limited in size, there is enormous potential for scaling up [12].

### **3.6 Spreading Awareness through Workshops and Training Events**

One project goal was to spread awareness among people and relevant actors. A series of workshops and training events were held in each province for project partners, local artisans, beneficiary households and neighbours. Hundreds of people were trained in technical knowledge of safer, resilient housing techniques through numerous training courses facilitated by the provincial DoC and UNDP. Most attendees were men, while the rest were women. Project partners demonstrated improved knowledge and skills in safer and more resilient house design, as did many of the 18 households interviewed. The training enabled families to monitor the construction of their homes based on their new knowledge and understanding. It was found that some parts of the training materials could be simplified by using photographs of real houses instead of technical drawings.

### **3.7 Positive Social Impacts and Strong Social Cohesion through Participatory Reconstruction**

Under the inclusive-participatory approach, people were considered the centre of reconstruction. This created positive impacts on both beneficiary households and their community. People felt that their position was elevated and became more confident in joining every activity in the locality. From this, they spread their love and enthusiasm among individuals and the community everywhere. Regarding the households that were met, they were mostly delighted because their circumstances have changed significantly for the better over the past year with the rebuilding of their new home. All beneficiary households met, as well as project partners and construction supervision engineers, described significant improvements in living conditions. Just before the typhoon, when all houses were temporary with a simple structure, in less than a year, people had new dwellings constructed by the project, ensuring the ‘Three H’s’: ‘Hard roof, Hard wall, and Hard foundation.’ In addition, all had benefited from training courses for safe house-building techniques. Households expressed sincere gratitude to the donor, UNDP and project partners.

Besides the individual household aspect, the influence on the local community was positive. Similar flood and typhoon-resilient house designs began to be copied by other households, local artisans and neighbours in the locality. In addition, discussion and spread of information on resilient housing among families through leaflets, stories and word of mouth took place in the communes and districts of the three provinces. Informed householders undoubtedly influenced their neighbours, relatives and friends regarding their safer, more hazard-resilient homes.

It can be said that there were neither social disputes nor selfishness in the local community during the rebuilding of houses. On the contrary, there was a warm interest and mutual aid among members of poor local communities and their relatives. Relatives and friends were ready to give loans to households to supplement money for rebuilding or repairing houses. This can be felt through opinions from Ms Cao Thi Hien, a 25-year-old woman with two children who had just lost her husband for several months: *“I just hope my neighbours also get a better place to live like me.”*

In addition to stronger community cohesion, the social responsibility of people and stakeholders increased. For example, construction contractors in Khanh Hoa were no longer solely interested in profits. They also considered rebuilding houses for the poor after a storm impacts as a social contribution towards improving the lives of people in their homeland.

### **3.8 Proactiveness and Activeness Accelerated through Inclusive Participation in Reconstruction**

Providing broad opportunities for engagement in rebuilding and repairing houses triggered people to be more proactive and active. Even without a large amount of money provided by the project, households still excitedly engaged in house construction with their best efforts. Many homes desired larger living spaces and extended rooms or built toilets/showers with their own or borrowed money. House owners of most rebuilt or repaired houses expanded the area (compared to the original 24 to 30m<sup>2</sup>) [11]. Some made changes to the types of materials used; for example, cement floors were replaced with floor tiles, and corrugated metal roofs were replaced with tiles (O2). Most houses were adjusted in size depending on household size and counterpart funds. However, some issues remained regarding interior space and living environment quality inside the homes.

A house for poor households is often an asset too vast for their lifetime income. However, having a stable, sustainable home can motivate many towards efforts to further their livelihoods and focus on improving their own lives and those of their children. Therefore, they were ready to use their savings as well as money borrowed from relatives and friends or low-interest loans from the Social Policy Bank as a supplement budget to construct larger and higher-quality homes compared to minimised cost house design models of DoC's. Some experts supposed that such a large amount of money motivated people to be responsible for contributing further to rebuilding their homes. However, there was concern about the non-payment debt of households in the future if they could not find any livelihood sources after settling into new houses.

It was observed that most households proactively used recycled material for new construction. This showed that a sustainable aspect of housing design appeared in rebuilding the house by the homeowner or partly resulted from saving money. In many cases, debris from old houses was reused in rebuilding new homes. For example, window and door frames, roof beams and roofing tiles were reused. Broken brick rubble and concrete from former shelters were selected for constructing foundations. Even though knowledge of green recovery and reconstruction ideas and techniques remained limited among households, local officials and other stakeholders, their willingness to reuse debris to reconstruct shelters showed that a green building approach had started happening in rebuilt storm-resistant houses.

### **3.9 Using Innovative Information Communication Technology (ICT) Tools to Monitor Reconstruction Brings Effectiveness, Transparency and Equity to Vulnerable and Poor People**

The application of innovative tools to monitor the reconstruction process was a distinctive feature and expressed the effectiveness of the inclusive approach employed in the project. Two innovative monitoring tools, Snapture and SeeTell, were selected. Both were available for download on popular smartphones and easily used after short, straightforward training. Snapture, by See/Saw, supported households in taking pictures of their houses during different construction phases, including before, during and after completion. These photos were sent to the Project manager to verify whether beneficiary households were correctly selected and whether their building was following the technical design. The app helped technical and project staff closely monitor the construction and repair of houses. It also supported construction supervision engineers who could track progress on hundreds of homes tens of kilometres away while capturing details. In addition, SeeTell – a mobile-phone-based call-back system (or hotline) – is a grievance mechanism that enables beneficiary households to use any mobile phone system for free to monitor their house



construction and proved critical for project managers. Snapture and SeeTell were appreciated as practical, innovative tools for reducing cost and promoting transparency in the house construction process through all stages under equal monitoring by homeowners and partners.

## 4 Conclusions

Restoring life for people impacted by disaster is always complicated and considered a multi-dimensional task from technical, economic, social, environmental, institutional and governance perspectives. The traditional top-down approach that stipulates every operation must be made through dictates and regulations have shown many weaknesses. It takes a long time and provides ineffective support for only a small group of beneficiaries.

It can be seen that full participation and close coordination among stakeholders in implementation can bring many unexpected results to beneficiaries affected by disasters caused by storms and floods. This positive approach can maximise actors' roles and mobilise stakeholders' overall strengths. The part belongs to state authorities at different levels regarding the institutional environment. In implementation and execution, responsibility pertains to socio-political organisations, people, communities and working groups such as artisans, masons and contractors. In addition, funding from international organisations and donors is always supervised by state agencies from national to sub-national levels in close coordination with domestic banks, especially the Bank for Social Policy. Pursuing this approach enables households to design and arrange their house space and actively seek finance for repair and reconstruction by reusing materials from old houses. They responsibly and proactively participate in restoring and rebuilding their homes with a positive spirit aiming at a better new life.

Thus, starting from efforts to overcome the consequences of a disaster, it became an opportunity to strengthen social cohesion among residents, relatives and neighbours and spread to overall local communities. A meaningful participatory approach transforms challenges into good options, especially for disadvantaged poor people who are often lonely groups unable to overcome difficulties by themselves without solid support from a cohesive community. In this project, supporting reconstruction for affected people was just part of the purpose; replicating what was done and bringing new awareness to communities were larger targets. From this perspective, building sustainable housing is preparation for responding to disasters preventing aftermaths and dealing with consequences.

Moreover, sustainable or disaster-resilient housing designs are effective solutions for preventing and reducing disaster risks. Therefore, this national strategic goal has been promoted nationwide in communities of both urban and rural areas and among people belonging to various income levels, including poor and vulnerable communities.

Training courses on reconstruction and disaster-resilient house design are essential. They not only spread awareness of disaster risks impacts but also teach rebuilding houses to respond to hazards while upgrading proactiveness and eliminating inherent subjectivity inside households towards disasters. This is an indispensable tool in implementation based on a participatory approach. These training courses certainly need to be held periodically by local authorities without waiting for support from funding projects.

Promoting new technology in implementation and administrative operations, such as banking transactions, is necessary for the age of 4.0. This provides a way for poor people to access every activity in society easily and expresses respect for vulnerable groups by not leaving them behind in the flow of technology.

Of course, aside from successful outcomes, there remained some challenges that needed to be solved in the participation process. For example, it is necessary to promote the role of specialists in advising people on rebuilding their houses to ensure suitable space and good

living quality. Another challenge is suggesting to poor people how to use their budget in compliance with their payment ability and balance it with their future income and jobs. The desire to shift their lives with a dream of a spacious house once in a lifetime may lead them into an extended debt situation where they cannot repay loans. Moreover, local authorities need to pay attention to general implementation plans where social programs ongoing in the province are coordinated and integrated effectively, such as programs for developing careers aiding loans for growing income and setting up revolving funds for poor and near-poor communities.

To conclude, this study was conducted based on a participatory approach through surveying results of the UNDP project supporting people influenced by Typhoon Damrey in three provinces where it was directly executed in 2019. The team spent a long time in localities conducting surveys and in-depth interviews with eighteen representative households. Even though this survey was completed several years ago, the conclusions regarding the advantages of an inclusive-participatory approach are still meaningful for now and for the future in the area of recovering and rebuilding houses for vulnerable households affected by the disaster. Therefore, it is proposed to expand research on building and completing guidelines for designing sustainable homes with housing models responding to storms and floods while complying with local natural conditions and social elements. In addition, solutions for restoration and income growth based on a community are necessary to combine with rebuilding houses for poor people. Moreover, it is also essential to extend studying participatory implementation frameworks that support local authorities in deploying and creating a legal basis for stakeholders to effectively engage in reconstruction progress for people affected by a disaster.

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