SHELTER HUB OPERATIONAL MANUAL

A HANDBOOK ON PROMOTION OF DISASTER RESILIENT HOUSING THROUGH BUILD BACK BETTER AND SAFER…….

United Nations Human Settlement Programme
(UN-HABITAT)
India

Preface

Between June 1 and August 18, 2018, the State of Kerala experienced the worst ever floods in its history since 1924. During this period, the state received cumulative rainfall that was 42% excess of the normal average. The heaviest spell of rain was during 1-20 August, when the state received 771mm of rain. The torrential rains triggered several landslides and forced the release of excess water from 37 dams across the state, aggravating the flood impact. Nearly 341 landslides were reported from 10 districts. Idukki, the worst hit district, was ravaged by 143 landslides. The flood left majority of people homeless due to impact to their houses severely damaging to their habitation.

Following the severe floods, a Post Disaster Needs Assessment (PDNA) was jointly undertaken by government, United Nations and other development partners to assess the damage and loss to various critical infrastructures. The assessment thus identified housing as one of the most affected sectors along with agriculture and livelihoods as most critical sectors needed priority interventions in the post flood recovery phase.

In the above backdrop, the United Nations Human Settlement Programme (UN-HABITAT) in partnership with United Nations Development Programme (UNDP) and in technical collaboration with Habitat Technology Group (HTG) implemented a Shelter Recovery Programme through establishment of Shelter Hub in various critical flood and landslide affected districts of Kerala state. With the funding support from Central Emergency Response Fund (CERF), ten shelter hubs were established in three most affected districts of Wayanad, Idukki and Pathanamthitta in order to support the most affected communities through the ten shelter hubs. The hubs were also manned by technical experts including Engineers and Architects to support during the shelter recovery process through acting as a knowledge center, building local capacities and providing hands on support to the population involved in shelter recovery process.

While the basic objectives of the shelter hubs aimed at providing technical know-how and day to day knowledge dissemination in “Build Back Better (BBB)’ and Safer, it also acted as a knowledge hub in ensuring a culture of safety through construction of disaster resilient housing practices among the communities.

The “Shelter Hub Operational Manual” thus would act as a guidance note for ensuring safe and disaster resilient construction in the most vulnerable communities of Kerala prone to natural disasters. It is expected that this manual would act as a reference for government, development partners, communities, private sectors and academia including professionals in strengthening and replicating the current shelter hub models in ensuring sustainable reduction of disaster risks in the state and other similar disasters in the country.

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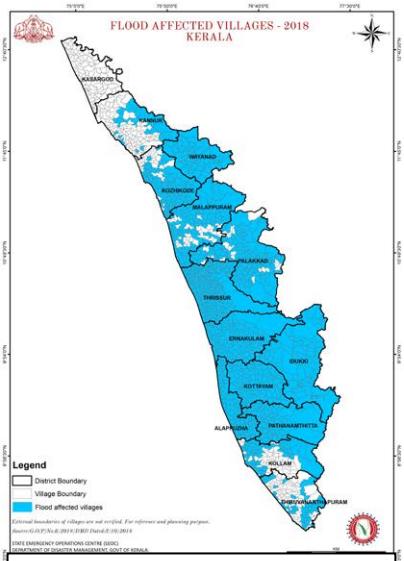
Abbreviations

BBB	Build Back Better
DRR	Disaster Risk Reduction
GP	Gram Panchayat
HTG	Habitat Technology Group
IEC	Information, Education & Communication
JE	Junior Engineer
KILA	Kerala Institute of Local Administration
LSGD	Local Self Government Department
NBC	National Building Code
PDNA	Post Disaster Needs Assessment
PRI	Panchayati Raj Institution
SC&ST	Scheduled Caste & Scheduled Tribe
UN	United Nations
UNDP	United Nations Development Programme

Chapter:1

Introduction

Kerala experienced the worst ever floods in its history since 1924 Between June 1 and August 18, 2018. During this period, the state received cumulative rainfall that was 42% more than the normal average. The heaviest spell of rain was during 1-20 August, when the state received 771mm of rain. The torrential rains triggered several landslides and forced the release of excess water from 37 dams across the state, aggravating the flood impact. Nearly 341 landslides were reported from 10 districts. Idukki, the worst hit district, was ravaged by 143 landslides. The flood left majority of people displaced due to damage to their houses[1]. According to assessments 1,259 out of 1,664 villages spread across its 14 districts were affected. The seven districts that were worst hit were Alappuzha, Ernakulam, Idukki, Kottayam, Pathanamthitta, Thrissur, and Wayanad, where the whole district was notified as flood affected. The devastating floods and landslides affected 5.4 million people, displaced 1.4 million people, and took 433 lives.



Map of flood and landslide affected districts of Kerala

The June–August 2018 monsoon season caused significant damage to the housing sector due to floods and landslides. Damage to the houses were due to inundation of the buildings and houses for several days and occurred near rivers, canals etc. These damages to houses could have been avoided if house construction had followed the minimum recommendations of the National Building Code of India (NBC, 2005). All the houses lost in landslides were located on unstable mountain slopes and would have suffered a similar fate regardless of building typology and construction technology used. Thus, the buildings were damaged due to the non-compliance with building safety standards. Recovery actions therefore were

[1] *Kerala Floods: Post Disaster Needs Assessment: August 2018*

recommended through integration of disaster-risk reduction (DRR) measures embracing the principle of 'building back better' (BBB) and increasing resilience to future hazards.

The damage assessment of housing which was led by the Local Self Government Department (LSGD) which estimated a total of 17,316 houses that are either completely destroyed or damaged beyond repair have to be rebuilt; another 2.17 lakh need repair and retrofitting. In line with the Government of Kerala's vision of a '*Nava Keralam'*, the reconstruction process is envisaged to adopt an eco-sensitive approach based on construction technologies that use local materials, through strengthening existing human resources and work force to undertake disaster resilient construction practices. It also envisaged to promote local level to fulfil the aspirations of the public, reduce carbon footprint, and create green jobs locally in large numbers.

Housing damage during the flooding and landslides in Kerala in June–August 2018 was caused by the scouring of foundations, settlement of soil, and inundation for several days. Houses in low-lying areas with low plinth heights were damaged much more than houses with high plinths and disaster-resistant features such as plinth and lintel bands. Masonry walls built with cement blocks without plinth bands weakened when water seeped up due to capillary action and collapsed. Many houses were completely destroyed in landslides, mostly in Idukki, Wayanad etc. These houses would have been destroyed regardless of building typology or construction technology, as they were located on unstable slopes. The remains of many of these structures may never be found as the huge landslides swept houses across roads and into the rivers in spate below. In some places, houses were affected by subsidence and suffered due to differential settlement of the foundation. Siting buildings on such slopes could have been avoided had there been regulations that mandated geologic inspection before excavation and construction on such slopes, and if the services of a geologist had been available.

The scale of destruction of dwellings could have been minimized, had the provisions for disaster resistance in the National Building Codes of India (NBC) been incorporated into the building rules of Kerala, properly enforced, and in turn followed by the people across the

state. Flood Damage Analysis of Buildings and Settlements. Many buildings in the flooded areas were either damaged or they collapsed because they were constructed without adequate disaster-resistant features such as plinth and lintel bands, as recommended in the NBC. The lack of horizontal bands to hold the walls together resulted in wall collapses, eventually leading to damage to the roof and further collapse. In many buildings, the random rubble stone foundations in cement mortar had inadequate depth, resulting in scouring of the foundation and damage to the walls. Many of the flood-damaged buildings had low plinth heights resulting in inundation for days. The main reasons for housing collapses were: (i) high current of the floodwater; (ii) the inundation of the buildings for several days, causing differential settlement of the foundations; and (iii) flash floods, especially where the buildings were too close to rivers and canals. Many buildings that adhered to the NBC did not collapse or sustain structural damage even though they were inundated up to the lintel/roof for several days, and only had to undergo minor repairs. However, most of the household assets in these buildings were totally damaged[2].

Rationale and Objectives of Establishment of Shelter Hubs:

During the Post Disaster Needs Assessment (PDNA), it was found that three sectors including livelihoods, agriculture and housing were the most affected in the floods and landslides that impacted the state. While there are various initiatives taken up by government, development partners and stakeholders on livelihoods and restoration to agriculture sectors, UN-Habitat and UNDP under its core mandates agreed and decided to undertake the shelter recovery initiatives in the state.

In this regard and in line with the recommendations of the PDNA, focus was provided on building local capacities, enhancing knowledge on disaster resilient construction practices and creating a cadre of experts including engineers, architects and masons were the main objectives of the shelter support while acting as 'Knowledge Broker' during the shelter recovery process. Thus, on the basis of the past experiences and lessons learnt from similar disaster situations, both UNDP and UN-Habitat jointly undertook a project on Shelter Recovery through establishment of Shelter Hubs in the three most affected districts of Wayanad, Idukki and Pathanamthitta. These shelter hubs are established with the broad objectives of:

[2] *Executive Summary: Post Disaster Needs Assessment;August 2018*

- Address the quantitative as well as qualitative housing deficit.
- Create an army of social entrepreneurs who can facilitate sustainable building construction.
- Reach out to the masses by promoting sustainable and resilient housing practices and technologies.

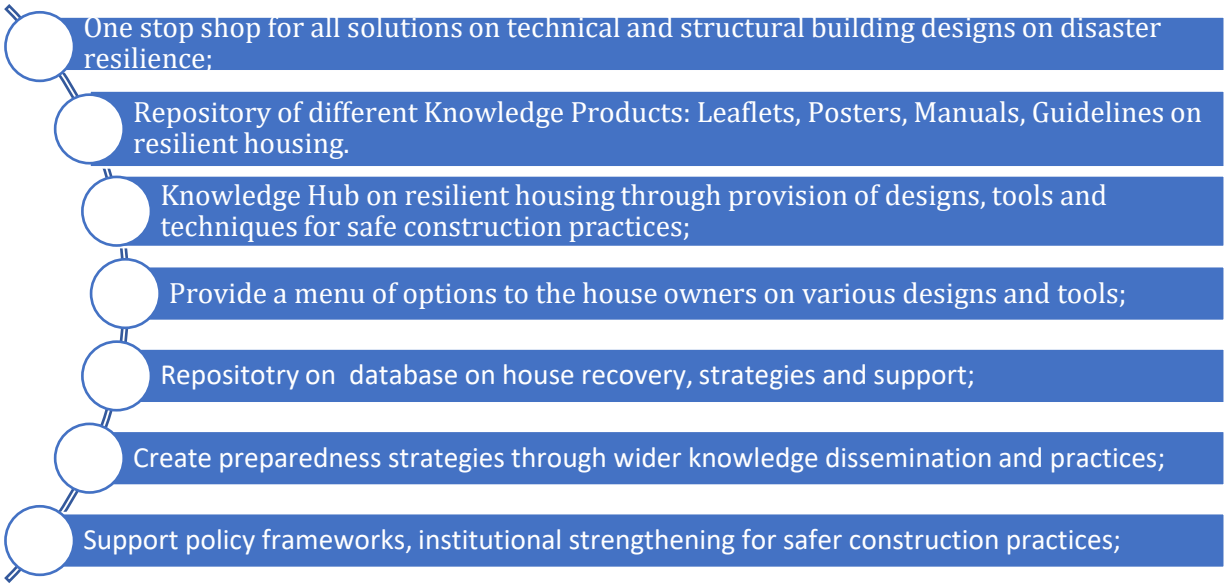
Besides the above broad objectives, the following are the specific objectives of the establishment of the Shelter Hubs:

- To provide advisory services, technical inputs on safe, secure and resilient housing techniques to the affected people;
- Centre of Knowledge Hub for resilient housing in the affected areas providing site specific technical interventions to make the houses disaster resilient;
- Establish a center through demand driven approaches to disaster resilient construction practices;
- Provision of data base of trained Masons, Engineers, Building material suppliers and damage assessment information;
- Models and typologies of houses to withstand Flood, Earthquake and Landslide.
- Cost comparison of past, current vs disaster resilient features;
- Dissemination of best practices from local, regional and national levels on safe construction practices and norms;
- Documentation of Best Practices for replicability.
- Support Government Shelter Recovery and Shelter Hubs.
- Advocacy on past vs present and disaster resilient features.
- Creating an enabling environment through large scale awareness through advocacy;

Chapter:2

Vision and Strategic Objectives

As mentioned in the previous section, housing sector has been one of the most affected during the floods and landslides and as identified during the PDNA process, the Shelter Hubs would be established on pilot basis in ten locations within the three districts of Wayanad, Idukki and Pathanamthitta districts of the state. These shelter hubs will facilitate in ensuring Build Back Better and Safer during the shelter recovery phase through knowledge, practices and creating a culture of safety and preparedness among the affected communities. Thus, the following are the most following strategic and inter related objectives of the Shelter Hubs:



1.One Stop Shop for technical and structural solutions: The Shelter Hubs would act as a center for providing all information and knowledge related to shelter and housing sector in terms of its designs, structural and non-structural features including developing tools and models that would provide knowledge, information on various shelter construction practices through adoption of disaster resilient construction practices;

2. Repository of Knowledge: The Shelter hubs will work towards developing knowledge products through development of various Information Education and Communication (IEC) materials on wide range of housing typologies that are contextual to the state including bamboo, RCC and V-board and will provide a list of Dos and Don'ts during the reconstruction phase to facilitate safer shelter construction. It will also provide guidance notes for masons, engineers and home owners to adopt various safety measures during the recovery phase to make the shelters build back better and safer.

3. Knowledge Hub on resilient housing: The shelter hubs would work towards provide knowledge and information center in enabling the communities to be able to get required information that will help them to take an informed decision appropriate to their needs and required measures during the shelter recovery process. It would also create an environment of effective preparedness and risk reduction measures through enhancing the knowledge and attitude through advocacy and knowledge building;

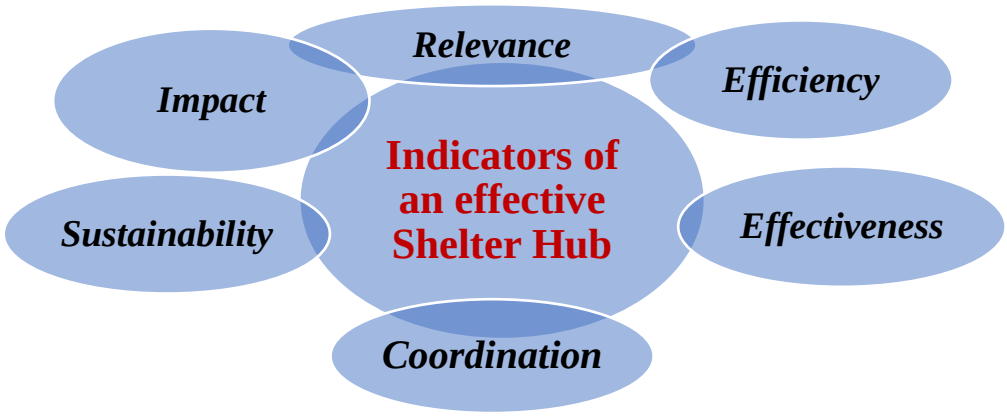
4. Provide a menu of options on disaster resilient construction practices: The shelter hubs would a center that would provide various menu of options on housing sector that would enable the communities, masons and engineers including home owners to identify appropriate, relevant and sustainable disaster resilient features that can be adopted during the shelter recovery process. It would also provide wide range of information and knowledge on disaster resilient construction practices during the shelter recovery process;

5. Repository of database on house recovery, strategies and support: The Shelter Hubs would also a center for repository of various information, database including providing strategic support during the shelter recovery process through wide range of technical assistance, guiding the whole process through monitoring, assessments and recommending appropriate measures during the recovery process;

6.Develop preparedness strategies through knowledge dissemination and practices: The shelter hubs would work towards developing preparedness strategies in shelter sector in identifying the gaps in the current ongoing practices and advocate for reinforcement mechanisms and disseminate knowledge through community meetings, consultations and orientations including conducting training programmes to wide range of stakeholders;

7. Support policy frameworks, institutional strengthening for safer construction practices: Besides the above, the shelter hubs will work towards upstream policy support through working with Disaster Management ministries and departments both at the district and block levels and support in strengthening various institutions that would address the critical gaps in shelter sector to make them disaster resilient. It would work with the housing and urban development, Local Self Government, elected representatives, communities in the whole process to create an environment of risk informed development in the whole process;

Key Indicators for Shelter Hub Operationalization:



Guiding Principles of Shelter Hub:

The Shelter Hubs during its operationalization process would work closely with wider range of stakeholders including government, development partners, elected representative, masons and engineers including the home owners to promote disaster resilient construction practices at all levels. It would provide wide range of knowledge, information, technical assistance through out the process to the population in need through building their capacities. Moreover, the shelter hubs would serve individual communities through better and effective planning, selection of sites and identifying appropriate measures during the construction process. Thus, the shelter hubs should look into the following parameters during its establishment and operationalization phase with the below mentioned recommendations:

- Shelter Hubs must be readily accessible to individuals affected.
- All Shelter Hub workers must be strong advocates for their clients.
- Clients must remain proactive participants in recovery.
- Shelter Hubs must provide a safe, secure and resilient construction practices environment that accommodates the broadest range of housing needs in the community.

Chapter:3

Operationalization of Shelter Hubs

Shelter Hub Operationalization Process:

1. Planning & Preparedness for Shelter Hub:

Task to be undertaken during the planning stage of shelter hub establishment include the following:

1. Identifying suitable locations;
2. Establish the Shelter hub in strategic locations for better visibility;
3. Selection of appropriate human resources with required qualification and experience;
4. Set up a workspace;
5. Develop Shelter hub operationalization strategy;

Proposed Activities:

1. 1-main hub or the Nodal Hub and 2 or 3 small Shelter Hubs per district, depending upon the geography and demography can be envisioned.

2. The concerned agency including Govt. department will conduct assessment of the panchayaths under the affected or planned districts to identify 3 to 4 panchayaths which meet the following criteria.

• High density of affected population.

• Severe damage due to floods.

• Presence of a vulnerable population.

3. In the identified panchayaths, a suitable rented or Govt. space will be identified and contract with property owners will be signed to set up the Shelter Hub (800 – 900 sq ft). A big shop or 2BHK house could also be considered, wherein the living and dining spaces are used as the office space for the Hub.

2. Setting up of the Shelter Hub:

Opening the Shelter Hub requires selecting an appropriate available location after assessing the disaster and the sheltering needs it has caused.

A Shelter Hub Manager should meet with the house identified in the suitable location to review or execute a Shelter Hub Agreement, inspect the house and open it for the Hub. The Shelter Hub Manager disseminates details about the Hub opening, Location and services to the general community and other partners.

3. Organizing the Shelter Hub:

Organizing the Shelter Hub involves various steps and actions that could be simply put together as below.

1. Procuring necessary items:

    • Office Furniture

    • 1 Computer, 1 Printer

    • Communication material: telephone / internet

    • Other office supplies.

    • Renting of Bikes/Vehicles for Field movement.

2. Hiring of staff. The staff planned for the Hub could be given as below.

    • Shelter Hub Engineer / Architect – 1

    • Shelter Hub Assistant Engineer – 1

4. Operationalization of the Shelter Hub:

Building Techno-social Consultancy

Task that could be undertaken including

1. To help affected home owners in selecting cost efficient and sustainable construction technologies for the repair, maintenance and reconstruction work.

Activities

1. To offer honorary advice and services on safe construction practices to the affected house owners.

2. To provide professional guidance in project conception as well as implementation. Consultation facility for design, site selection and various technical aspects will also be provided.

3. To assist home owners with repair works and maintenance appropriately based on its relative vulnerability.

4. To conduct one to one group training and hands on workshops for beneficiaries, masons, local Engineers and other affected home owners.

5. Shelter Hub can also conduct trainings and/or workshop/s on themes such as Disaster Resilient Housing Techniques, Retrofitting of Houses in vulnerable areas, Sustainable Building Materials, Alternative Construction Techniques, Waste Management, Energy Efficiency etc. The themes are indications and could be finalised in consultation with Govt. and the affected communities depending on the needs of the community under the Shelter Hub.

6. The training programmes and workshops conducted will equip beneficiaries with technical, financial and management skills necessary for their area to build back better and safer thereby, creating a skilled local workforce that can revive indigenous construction techniques adapting to the present circumstances.

Networking- Creation of a skilled labor pool.

Task to be undertaken:

1. Creating a network of skilled laborers.

2. Identifying artisans and introducing them to sustainable building materials and technologies.

3. Spreading awareness on sustainable and eco-friendly technologies.

Activities

1. Shelter Hub will engage with Panchayat and local community members to map local labor pool and their skills.

2. Shelter Hub will prepare a database of identified artisans and this information will be made available to public.

3. The information on the availability of various building materials and its relative cost comparison vis-à-vis its durability and necessity in the area in which it is planned to be used.

4. The identified artisans will be trained by the Shelter Hub on Resilient Housing Techniques, Sustainable, cost-effective and eco-friendly construction practices using locally available building materials.

Outreach and Advocacy

Task to be undertaken

1. To develop training modules on sustainable and safe construction practices for various stakeholders like the Masons, Engineers and/or the House Owners.

2. To participate and represent Govt. in all appropriate events relating to safe construction practices.

Activities

1. Modules on sustainable building materials and cost-efficient construction technologies could be provided in the form of small booklets, visuals and presentations. The documents will be compiled at the Shelter Hub and used for future reference and will also promote general know how about sustainable construction practices.

2. Shelter Hub will compile best practices on sustainable building construction which are locally relevant.

3. Shelter Hub will prepare a database on sustainable building materials which are locally available. The database will include names of vendors / suppliers. Also, to include information on other uses, quantity required and quality of the materials.

4. Through public participation, the Shelter Hub will generate awareness and thereby cause a behavioral change towards responsible construction among different stakeholders of the sector.

Additional Services

In addition to the scope of works and activities mentioned, Shelter Hub may also undertake the following:

1. Best from Waste

• Shelter hub could initiate a scrap collecting drive wherein the public would be encouraged to drop materials like scrap metal, old wood, salvaged materials etc. after demolition of buildings affected by the flood. The hub in return will provide a subsidy on the recycled product.

• The intention of this drive is two-fold. The primary goal being the reduction of material wastage and the secondary goal being the cultivation of responsible waste management habits among the public.

2. Production yard for self-help groups.

• Shelter Hub envisages it to have common space which will be utilized for income generation by women or other vulnerable communities.

5.Review and Follow up Action:

Review of the activities once in a month at the state level is essential to have common understanding of the activities and deliverables along with the relevant line department heads.

Besides, concurrent monitoring and review of the different Shelter Hubs within the district has to be done at least once in a fortnight at the Nodal Shelter Hub and can have additional other meeting/s in case of an emergency.

The Shelter Team members could be in a common social networking group e.g. WhatsApp and/or group mail to keep abreast of the latest happenings in the sector at the state and national level for being updated in the field. Besides, there could also be clarification on the different activities to be undertaken under the Shelter Hub. This could help build common understanding amongst the Shelter Team members.

Observations:

Community's management of disasters is not new as they have always been the first responders. Systematic community-based disaster preparedness is truly proven approach to build resilient societies, particularly in a state like Kerala prone to multiple hazards. Sustainably reducing underlying risks to disasters in the state has led to the concept of creating the Shelter Hubs supporting in building disaster resilient housing.

With gradual mainstreaming of the Shelter Hubs with the general development programme of the state with the laid down processes and principles will contribute towards improved and sustainable development thereby bringing about resilient infrastructure and reinforcing the concept of build back better and safer. Shelter Hub is now an accepted instrument by the socio-political system in planning for resilient infrastructure development particularly in the multi-hazard prone areas of the state of Kerala.

Thus, the chipping in of the DRR lens into the rebuilding resilient habitation would go a long way in sustainably reducing vulnerability of human settlements.

Chapter:4

Challenges, Opportunities and Way Forward

Challenges:

The Shelter Hubs' establishment clearly identifies the inadequacy of the disaster affected areas in providing a space for running an office and conducting skill transfer training to the community and local masons.

Although the Govt. engineering officials meet during the work are well aware of the processes to be adopted and measures to be taken with respect to the specific local disasters, there lacks a clear communication from the Govt. in going in for alternative techniques.

Further, there is no DRR considerations for the projects as otherwise it would have higher budget allocations (e.g. raised platforms would need additional funds for the construction in flood water inundated areas). Thus, a DRR inclusive Framework will have its own advantages associated with sustainable infrastructure development at the decentralized level. Once the Shelter Hub becomes part of the government's organizational structure, it will have both social and political acceptability and would be a potential vehicle for building in sustainable, resilient infrastructure.

Largely the present situation indicates that there is conducive environment for the whole concept of integrating Shelter Hubs into the system albeit a lot has to be done at different levels in varying phases of establishing the Shelter Hubs.

Opportunities:

The Shelter Hubs are critical support to the disaster affected population, masons, engineers and home owners including the government departments at various levels to provide knowledge, attitude and practice through creating an enabling environment for effective preparedness and responding to any future disasters. It provides various tools, knowledge and techniques through a platform of discussion and decision-making process and act as a demand driven approach towards ensuring disaster resilient construction practices in the context of Kerala.
Besides the knowledge and technical assistance provided the shelter hubs, it also acts as a center of information that provides various knowledge products, advisory services and provides evidence base approach to resilient construction practices.

Thus, the Shelter hubs works with various housing sector departments, elected representatives and wide range of experts in the whole process of shelter recovery that provides a platform for Knowledge broker in the context of shelter recovery initiative in the state of Kerala.

Recommendations:

General Recommendations:

- Agreement of the Govt. on Shelter Hub as a DRR inclusive integrated institutional instrument promoting resilient housing in areas vulnerable to multi-hazards.
- Revised Guidelines issued from Govt. on resilient housing.
- Appropriate letter to the District Collectors from the Principal Secretary, Revenue & Panchayati Raj, Govt. of Kerala on DRR inclusive planning for human settlements.
- Development of a range of options using alternative techniques for disaster resilient housing based on different topography and geology of the area.
- All infrastructure development by the Govt. has to pass through a local terrain-specific disaster and DRR lens of the competent Engineering professionals of the Govt. machinery.
- Local NGOs and/or international agency's support could be sought in preparation of model houses on a pilot basis only for the infrastructural projects in line with the general Govt. orders.

Specific Recommendations:

- Inclusion of DRR inclusive Housing Techniques in the Training Calendar of State Training Institutes (like KILA) at Thiruvananthapuram.
- Development of PRI Training Module and its use in training of the PRIs by the State Institute.
- Scrutiny of the infrastructure development projects through a DRR lens by the Asst Engineer before it is placed and passed in the Village meeting.
- Formal approval of the Asst. Engineer of the projects with a DRR lens before it is unanimously accepted in the Gram Sabha. (GP level) The realistic estimate is to be made by the Engineers and should not be a wish list of the community. Communities can demand for their requirement/s and necessities but the Engineer would consider DRR aspects before placing it up in the Village meeting.
- The infrastructure projects could then go the Govt. for final approval.