# Innovating with APP: supporting social innovations for Disaster Risk Management

Disaster Risk Management (DRM) operations are becoming complex and require changing technologies, approaches, tools, and more efficient and cost-effective solutions that are easily accessible and adaptable across the spectrum of the disaster management cycle. Communities face repeated disasters, often formulating local solutions to manage them. These trends necessitate 'new ways of thinking and approach' for disaster risk management.

WIth this vision, the Asian Disaster Preparedness Center (ADPC) launched the "**Social Innovation Grand Challenge**" on 4 May 2021 under the Asian Preparedness Partnership (APP). It sought to identify and support innovations from local actors in the APP member countries. The solutions centered around addressing disaster risk management challenges focused on risk communications, early warning, and emergency response. Correspondingly, the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 emphasizes the "use and expansion of thematic platforms of cooperation, such as global technology pools and global systems to share know-how, innovation, and research and ensure access to technology and information on DRR". Keep reading to find out more about some the innovations supported by the APP Social Innovation Grand Challenge.

> "Innovation is a process of identifying, nurturing, scaling, and disseminating new ideas, solutions, products or tools that meet a social need and lead to new or improved capabilities and cost-effective utilization of assets and resources, especially for locally-led actions for disaster risk management."
>
> ADPC on innovation in DRM

## The APP Innovation Approach

Asian Preparedness Partnership strives to foster innovation for DRM in Asia. It advocates key enablers for innovation:

**Building partnerships**
Partnerships with relevant local organizations already engaged in innovation-related work partnerships in APP countries

**Facilitating access to funding**
Mechanisms to provide resources and guidance for identifying, nurturing, and disseminating innovative solutions

**Informing policy directives and frameworks**
Sensitization on the value of innovation for DRM among relevant experts, facilitators, end-users

**Developing expertise and capacities**
Enhance the capability of local organizations to identify and foster innovative solutions in the field of disaster risk management

**Promoting innovation champions**
Showcasing promising practices and effective examples of innovators and the impact of their solutions

APP envisions that these focus areas will facilitate the progress of innovative DRM approaches by providing an environment conducive to institutionalized, efficient, and cost-effective actions led by local actors.

# Early warning system for Badin district, Pakistan

**Pilot Location: Badin district, Sindh province**

Shifa Foundation serves underprivileged communities and provides countrywide humanitarian and development services with multi-disciplinary and multi-dimensional approaches to address the unmet needs of the communities. Accredited and certified by Pakistan Centre for Philanthropy (PCP) and Economic Affairs Division (EAD), it has assisted more than 10 million individuals in different thematic and geographical areas of Pakistan to create an enabling environment for deprived children, women, families, and underprivileged communities with dignity.

Currently, information regarding any emergency like a cyclone or rain flood emergency in the coastal area is being shared by the Pakistan Meteorological Department (PMD). The PMD follows two route communications, i.e through Pakistan Coast Guard and National Disaster Management Authority. The main objective of this intervention was to:

1. establish an effective EWS that protects the communities from flood emergencies and disasters due to cyclones.

2. help emergency response agencies to respond timely and efficiently.

## Innovation & Novelty:

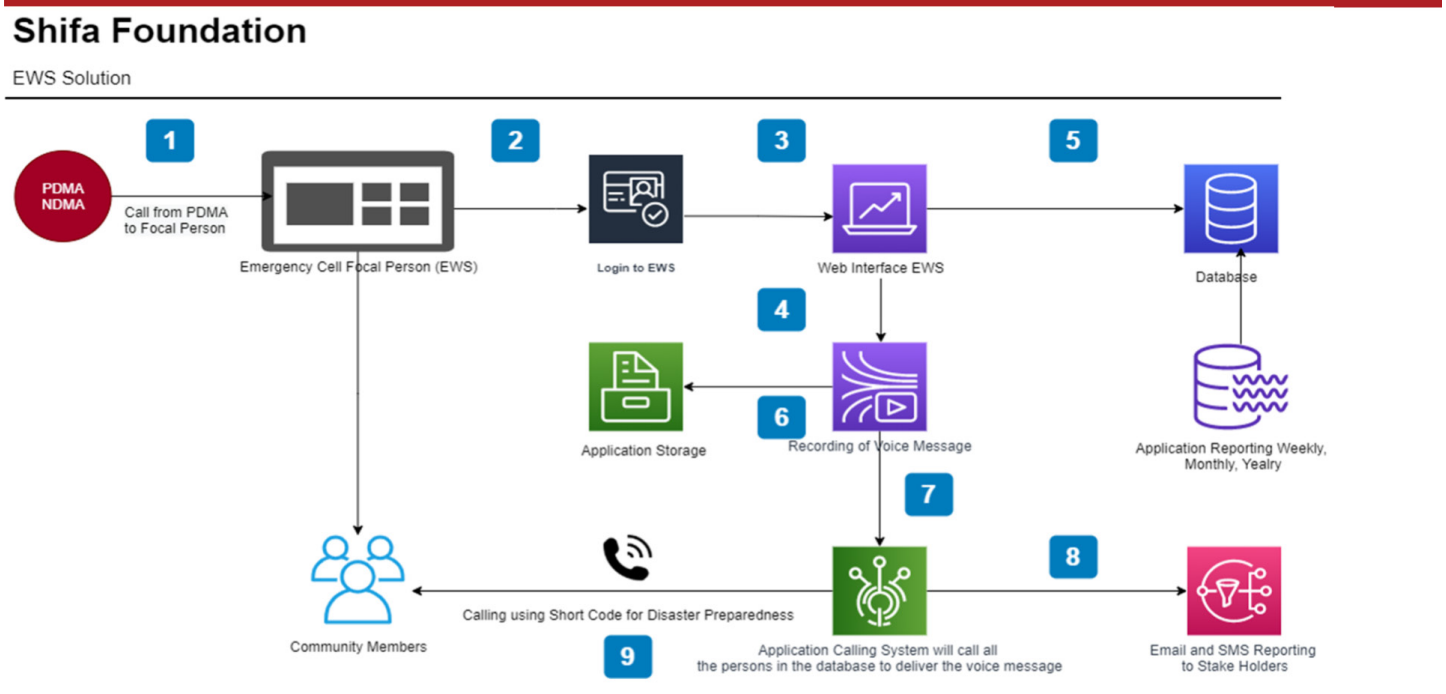
- Mobile application- all in one Information System
- Single click for updated quick information
- Accessible to community (Housed in Emergency Control Room of DDMA- District Badin)
- Involved community through Community Focal-Persons for quick dissemination of information.
- Made possible quick evacuation during emergency to save lives and losses.

Shifa Foundation identified 100 villages in five union councils of district Badin for the implementation of the activities. It has formed 30 village level DRR committees and 10 committees at the Union council level. With the support of a community focal person, Shifa Foundation collected contact details in order to compile a database of contact information which will help to inform the target population immediately after receiving information from the central or provincial government line department in the event of an emergency. These numbers have been compiled so that nominated staff from the government can use them in the future for the circulation of early warning messages.

## Application:

The innovation was successfully applied during the last monsoon rains and floods (2021), which ultimately strengthened the capacity of the District Disaster Management Authority (DDMA) in timely response during the last floods and heavy rains. They were able to ensure safe exit and save precious lives and assets of the disaster-affected communities. The DDMA authorities even requested to replicate the model in other districts as well to save the lives and assets of the devastating communities. The trained personnel may be able to apply their services anywhere in the country and can train further staff members on the modality. At the community level, the trained beneficiaries enhanced their capacity to plan properly before the disaster and manage during the disaster. The results of adjacent districts given below reflect the outcomes of the innovation; Badin (deaths: 12, injured: 0), Sukkur (deaths: 14, injured: 19), Shikarpur (deaths: 66, injured: 114), Khairpur (deaths: 47, injured: 33), Nowshero Feroze (deaths: 12, injured: 0),

# Solution Development Process



# Community-Gatherings



Stakeholders Engagement in designing, testing and scaling of the solution

(deaths: 34, injured: 61), Jacobabad (deaths: 17, injured: 35), Mitiari (deaths: 5, injured: 69). Compared with other above-mentioned districts, the life losses and injuries statistics show that the Badin community is resilient and can manage to combat disasters.

## Localization & DRM:

- Locally accessible solution (Housed in Emergency Control-Room of the District)
- Enhanced capacity of local stakeholders & Community Resilient to disasters.
- Introduced customized IT-solution to combat disasters in a local context.

## Social-Impact of the Solution:

- Trained DDMA on Early Warning System.
- Formed Community Disaster Committee at district-level for quick response.
- Trained 100 persons of the community for utilization of local resources.
- Developed 100 Hazard and Risk maps
- Established Emergency-Cell led by the Deputy Commissioner and District Coordination Officer to bridge up the community and government departments.
- Enhanced capacity of DDMA & Govt. staff to equip them with EWS

# Dis-Map: Disaster Management Platform for Emergency Response

**Pilot Location: Grama Niladhari division, Sri Lanka**

The University of Moratuwa (UoM), established in 1978 in Sri Lanka is composed of 35 academic departments offering 13 undergraduate and 56 postgraduate programs and prioritized the improvement of research and innovation in its development strategies. The Department of Civil Engineering (DoC) at UoM is one of the largest Civil Engineering departments in Sri Lanka, with six disciplines, including building and structural, transportation, geotechnical, construction management, environmental, and hydraulic and water resources. The DoC has played a leading role in disaster risk management (DRM) since the 2004 Indian Ocean Tsunami, providing technical guidance and research innovations. The department has been involved in developing nationally important guidelines and building regulations for landslides, floods, tsunamis, and storm surges.

- Dis-Map ensures seamless communication and coordination during a disaster through this widely adapted platform for communication. The Disaster Management Platform for Emergency Response (Dis-Map) fills the communication gaps at the disaster response stage while enabling two-way communication between at-risk communities, authorities, and other stakeholders involved in the disaster response process. The system can be effectively used to disseminate alerts and warnings to the community.
- Dis-Map revolutionizes emergency response procedures by bringing together authorities from the national to community levels to a single web-based platform. The evacuation portal within Dis-Map allows for a real-time exchange of information on community needs, disaster updates, and shelter management, making it easier for authorities to respond quickly and effectively.
- The app integrates technical agencies such as the Meteorology Department, Irrigation Department, National Research Building Organization, and Geological Survey and Mines Bureau, enabling the dissemination of warnings to the communities.
- The platform empowers communities to report emergencies directly by creating a two-way communication flow that strengthens the overall response efforts. Dis-Map reduces confusion and streamlines response procedures by streamlining information and communication. This makes it easier for authorities to provide support and assistance to those in need.



## Impact of Dis-Map:

The support from ADPC led to a pilot test that will soon be conducted on selected Grama Niladhari divisions in coordination with the Disaster Management Centre, Sri Lanka, and other technical agencies registered on the platform. Dis-Map is poised to play a key role in the Climate Resilient Integrated Water Management Project (CRIWMP), which is funded by the Green Climate Fund and implemented in collaboration with the United Nations Development Program (UNDP). One of the project objectives is to develop a digital mechanism for disseminating flood early warnings to communities. A team of academics from the UoM has been engaged to conduct a feasibility analysis to determine if Dis-Map can be further improved for this purpose. During the feasibility study, the project team will assess the possibility of incorporating river gauge data into the platform and disseminating flood warnings to communities. The ultimate goal is to issue impact-based warnings to communities through the Dis-Map platform. The project team is committed to continuously enhancing the capabilities of the platform to serve those in need during disasters.

# Yangon Neighbourhood Network (YNN)

**Pilot Location: Yangon, Myanmar**

Doh Eain, Myanmar: Doh Eain ("Our Home") is a multi-disciplinary restoration and placemaking social enterprise based in Yangon since 2017. In a world of rapid urbanization, our vision is that of cities maintaining their unique character while being liveable, inclusive and sustainable. They work on the preservation of small-scale family owned heritage, on improving public spaces, and organizing activities that connect people to places and strengthening community resilience with a diverse team of 30+ researchers, designers, architects, community engagement specialists and PR professionals.

*Doh Eain is a participatory design practice founded in 2017 in Yangon, dedicated to making cities better. It specializes in preserving heritage, creating and improving public spaces, and organizing events, campaigns and workshops that connect people to places while empowering them to take part in shaping their city. Doh Eain's experience in placemaking and design was the key to unlocking innovation around DRM.*

In 2020 with the onset of COVID, Doh Eain established the Yangon Neighbourhood Network, a network that has since grown to 150+ neighborhood based organizations reaching all 33 townships of Yangon. Through the YNN Doh Eain collects neighborhood level data on for example household needs, while connecting the YNN members to resources, facilitating peer learning, and supporting the members with light reporting, so that they can rapidly roll out relief activities in an accountable manner to places and people needing help.

The YNN digital platform systemised the workings of the Yangon Neighbourhood Network, improving the quality and accountability of informal groups undertaking relief activities while making these activities more visible and easier to support for large donors. The platform also provides a library of resources and easy ways for informal


## The Process


YNN

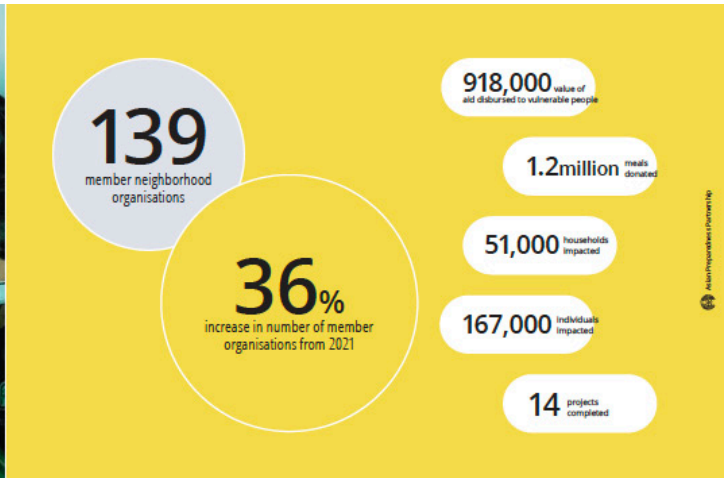
groups to get in touch with each other. The platform has helped dozens of informal groups in Yangon tap into the networks, capacity building and donor funding to scale up and continue their very effective emergency response work.

### YNN allows organizations to:

- make a profile in which they share key information about their response capacity and needs, such as their geographic location, # of staff or volunteers, expertise, skills and resources, and ongoing activities. This will subsequently be presented to other website users in a very visual and accessible manner.
- share challenges and solutions, including, but not limited to, climate adaptation thematic focus.
- cost about any resources they have to share (e.g. trucks, sandbags), and resources they are looking for from others (e.g. walkie-talkies).
- easily share information, resources, templates, and training, including the offer of webinars and peer learning sessions. Moreover, YNN holds a library of resources that can be accessed 24/7 by any YNN member.
- communicate between YNN members and the secretariat (currently Doh Eain facilitators), not least when other methods of communication and coordination are cut off or unsafe during emergency response cycles (e.g. the prohibition of Facebook, Whatsapp and Instagram by the military following the coup in February 2021).
- track impact data, and get visualizations which allow them to record, and prove their activities, both individually and as a joint effort.

### Impact of the YNN platform:

- Communities/ CSOs/individuals' voices are heard and valued in disaster response and mitigation.
- Greater awareness of the needs of the most vulnerable: clear visualization of their needs and easy recognition of the vulnerable groups ie. women and girls, PWDs, the elderly, minority ethnicities, daily wage earners
- Strengthened response network, in times of crises, vs an individual group response
- Grassroots organizations' / CSOs' capacity is increased for knowledge management, reporting and communication, especially through the 24/7 online library of training and info.
- Increased use, safety, security and knowledge of digital tools as a response and communication mechanism, not only the online platform but also the telegram group



# Resilient Urban Simulation Platform

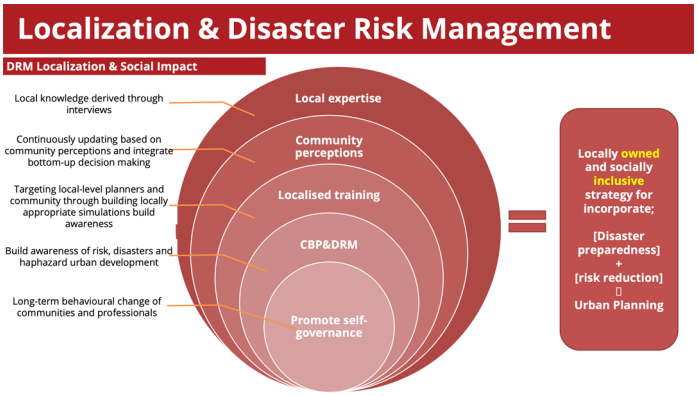
**Pilot Location: Institute of Town Planners, Sri Lanka (ITPSL)**

The Institute of Town Planners Sri Lanka (ITPSL) is the professional body responsible for enhancing the Town Planning Profession in Sri Lanka. It strives to promote the town & country planning profession in Sri Lanka and to enhance the standard of the profession in keeping with global trends and developments in this field with 550 members involved in planning related activities on different platforms. The institute also plays a lead role in expressing its professional opinion on matters directly and indirectly concerned with the urban and regional development of Sri Lanka. ITPSL has offered its advice and services to the government, semi-government institutions, and provincial and local authorities.

Disasters have a compounded impact due to unplanned settlements and changing urban landscape. Haphazard developments also give rise to the risk of frequent disasters. Ultimately all this affects a city's long term resilience. A city's resilience is addressed through Disaster Preparedness Planning and Urban planning. However most development work is done in silos. Therefore there is a need to strengthen the relationship between preparedness planning and urban planning domains and improve understanding of preparedness among town planners—especially the young planners.

ITPSL developed an innovative resilient urban planning simulation platform that is used to train planners and build community awareness to improve urban resilience.

- The solution advocates continuously capturing the perceptions of local professionals, and communities.
- The platform is continuously updated based on changing perceptions and community requirements.
- It is a hybrid solution consisting of both virtual platform and physical training center.

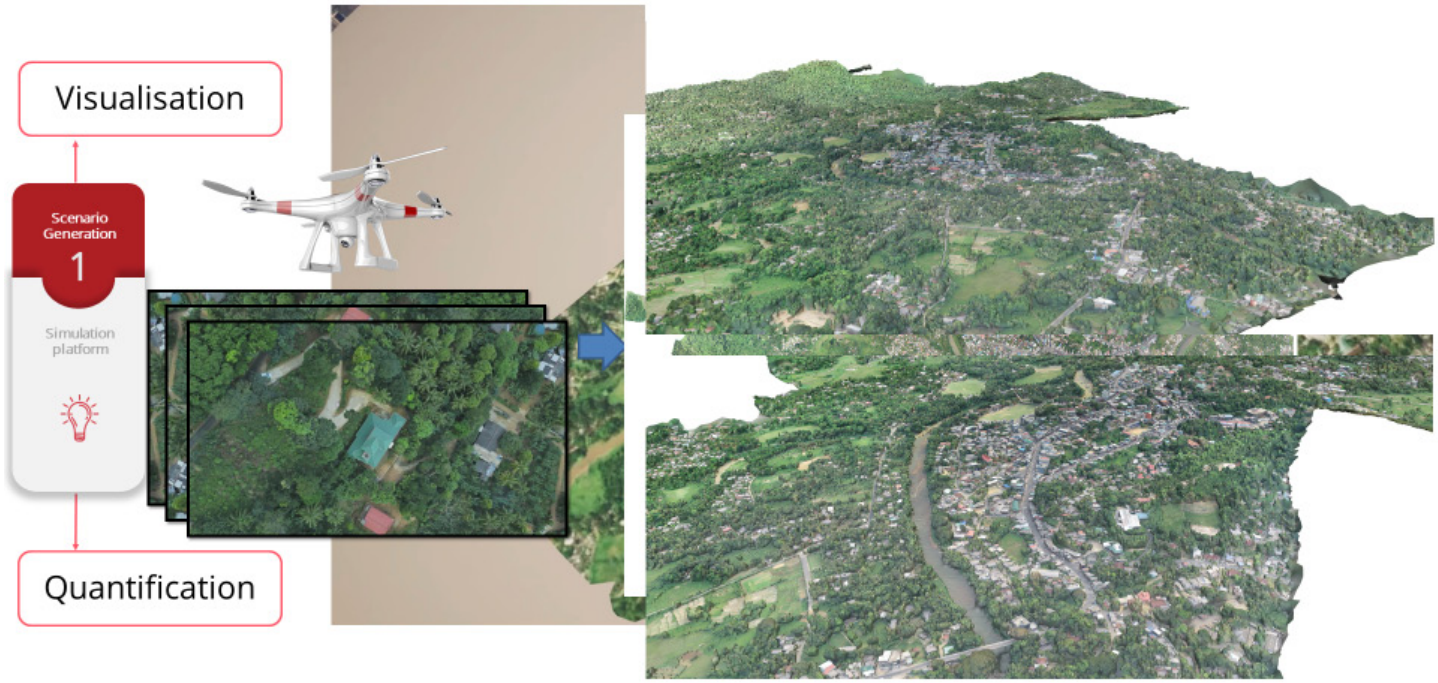



The platform gathered disaster management experts, urban planners, and the community. A perception survey was conducted with stakeholders and a framework was developed based on the 34 perception surveys. This framework was used to evaluate different cities in the world to generate a resilience scale, which helped to understand successful disaster-resilient urban plans. ITPSL also developed a gaming tool to help users improve their theoretical and practical knowledge of disaster management, in particular urban resilience.

### Impact of the Digital Platform:

The Rathnapaura City Development plan was evaluated using this resilient scale and identified the resilience state. Even though several training awareness programs were conducted by various organizations, the advocacy

## Product or Solution

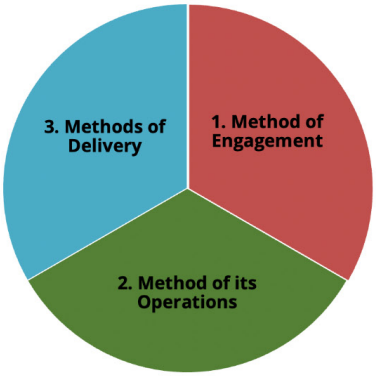


# Overview

**What makes the solution INNOVATIVE?**

## AN INNOVATIVE RESILIENT URBAN PLANNING SIMULATION PLATFORM

Hybrid Solution is a **(1) Virtual "Gamification Platform",** which is based on cloud network (Systems Dynamic Model) generating different resilience scenarios for long range urban planning incorporating disaster situations and **(2) Physical Training Centre** to conduct simulations-based training




Advocates **continuous engagement of the stakeholders & communities**

The platform is **continuously updated** by incorporating community perceptions captured through web application and interactive training sessions

# Engagement with Stakeholders and Beneficiaries


- Local Professionals perceptions and existing practices had been captured
- Collaborated with National-level institutions to share technology
- Consulted with regional planning agencies for contextual alignment of products
- Research-based models and simulations were developed by integrating perceptions and technology
- General Public's perceptions are being captured and integrated into simulation models


on the disaster risk management (DRM) concept was still in the primitive stage in the communities. It motivated the research team to recall their memories of their previous incidents and showcase the importance of DRM concepts. A case study was selected in the Rathnapura area, and a 3D video was developed to illustrate the concept. The model was tested in the community and stakeholder workshops in Rathnapura. The approaches were presented at many stakeholder meetings. These events provided feedback from the Mayor of the Rathnapura Municipal Council, Rathnapura Urban Development Authority (UDA), and the community in the pilot locations. In addition, the National Building Research Organisation (NBRO) has developed a manual of "Virtually designed training sessions for disaster preparedness". The manual will serve as a reference point for the initiative to be scaled out or replicated in other locations.

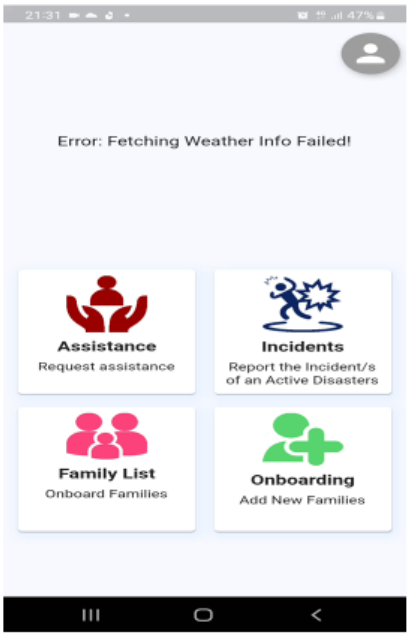
# Sri Lanka Red Cross Society Mobile Application

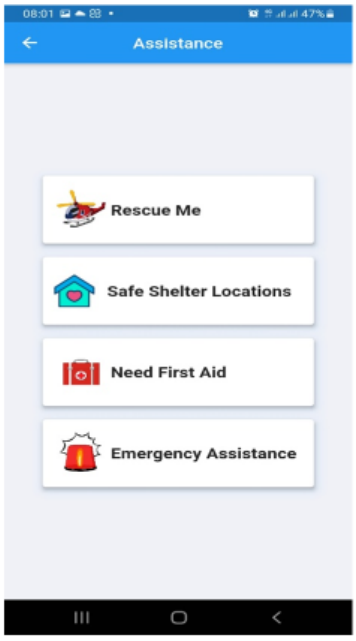
Sri Lanka Red Cross Society (SLRCS) is the largest humanitarian organization in the country, with 100,000 volunteers and 6,500 active volunteers. Its network covers all 25 administrative districts in the island. SLRCS involves in all aspects of the Disaster Management Cycle, addressing issues around preventive including Disaster Management, Health, Humanitarian values, climate change adaptation and Social inclusion.

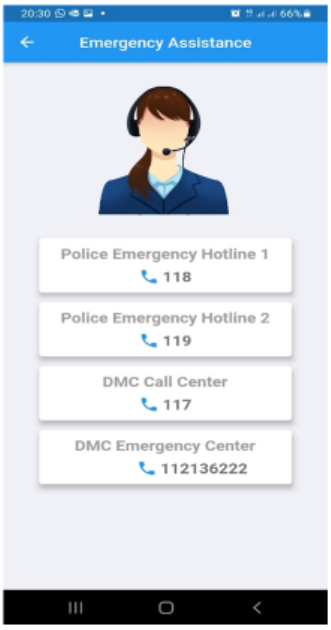
SLRCS initiated developing a mobile application as a public private partnership that can be used in pre and post disaster settings.During disasters, as one of the key response organizations in the country, SLRCS designed a response programme to conduct rapid assessments to gather information of the affected population. The app was designed to improve the efficiency and effectiveness of the response and relief activities.

Disaster Response Mobile application of Sri Lanka Red Cross Society was developed as an application that is user friendly to both Android and I-phone users within Sri Lanka. This application was created by considering

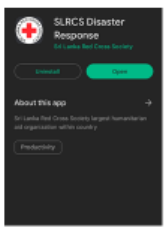
## Product or Solution




## Solution Development Process




**Development** → **User Acceptance Testing in the field and Training** → **Piloting / Deployment** → **SLRCS Mobile Application**

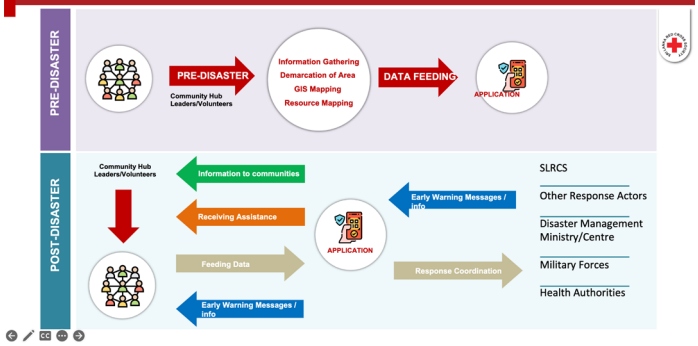
Continuous Monitoring

Studying Similar Solutions

Consultation

Cooperation with Humanitarian actors

## Localization & Disaster Risk Management




## Application of the Solution

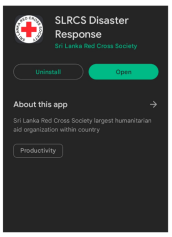
**Utilizing Mobile Application in Sri Lankan context :**

**Pre-identifying the vulnerable groups and**

**Enhancing transparency and community engagement and accountability :**

- **User friendly mobile application for data collectors and users to feed the data**

**Effective and efficient data collection and data analysis for stakeholders**




both responding organizations' information needs and affected person's demands for assistance. This system saves time and cost by reducing the paperwork that needs to be submitted by the beneficiary to SLRCS branch and from SLRCS branch to National Headquarters.

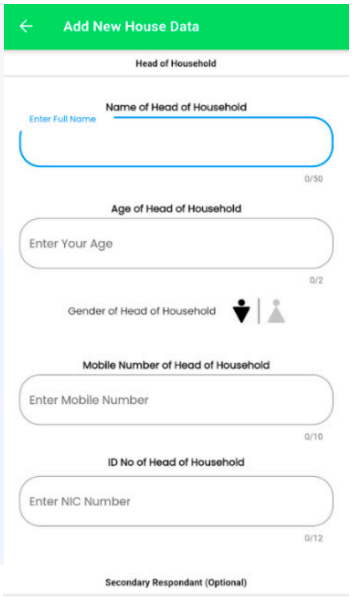
### Main advantage of this Mobile application is:

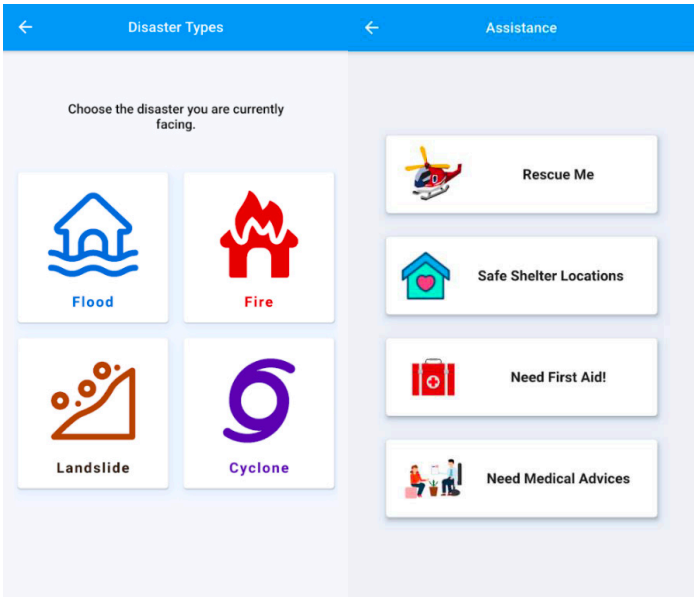
- its ability to connect disaster affected communities directly with stakeholders, ensures the community engagement from the inception of the concept itself.
- Communities that are already prone to disasters will be pre–identified and will engage from the planning stage which provides a sense of ownership to communities from the beginning.
- The application has a feedback mechanism which will provide communities to comment on the services provided through the application and connect with the responders. This provides an ideal platform for responders for improvement.

Throughout this process affected communities play a significant role in providing information such as mapping, uploading pictures and requesting assistance. This will save time, money and human resources in many ways. This further makes people more knowledgeable and accountable as they are involving with stakeholders to utilize these services.

A pilot study was initiated where the mobile application was piloted and tested for user acceptance in selected communities in disaster prone areas within the Colombo district. It was followed by focus group discussions with the community for inputs to identify the malfunctions of the application.

- In this Mobile application, the user can select the disaster type he/she is affected with. Under each disaster type, users will be guided to fill their demographic information which is required to initiate the response and relief process. Photographs can be uploaded and GPS locations can be marked during the assessment process which can be used as evidence. Under the assessment they will provide their province, district and Divisional secretariat which again link with other options such as safe shelter locations in the districts etc. All the options have the facility of uploading their GPS locations.
- Special features in the application such as Rescue ME!! Need First Aid, will assist the affected communities to directly communicate with responders / rescue operation officers.
- Details of the safe shelters in the district will appear in line with the geographical information provided while registration. First aid services and medical advice will be directly provided by the SLRCS. Apart from emergency response, SLRCS plans to implement a cash grant programme using this mobile application, which will be more efficient and trustworthy.
- Those who seek assistance from SLRCS volunteers can get the contact details through the application. If this application is used in the proper way, it will help

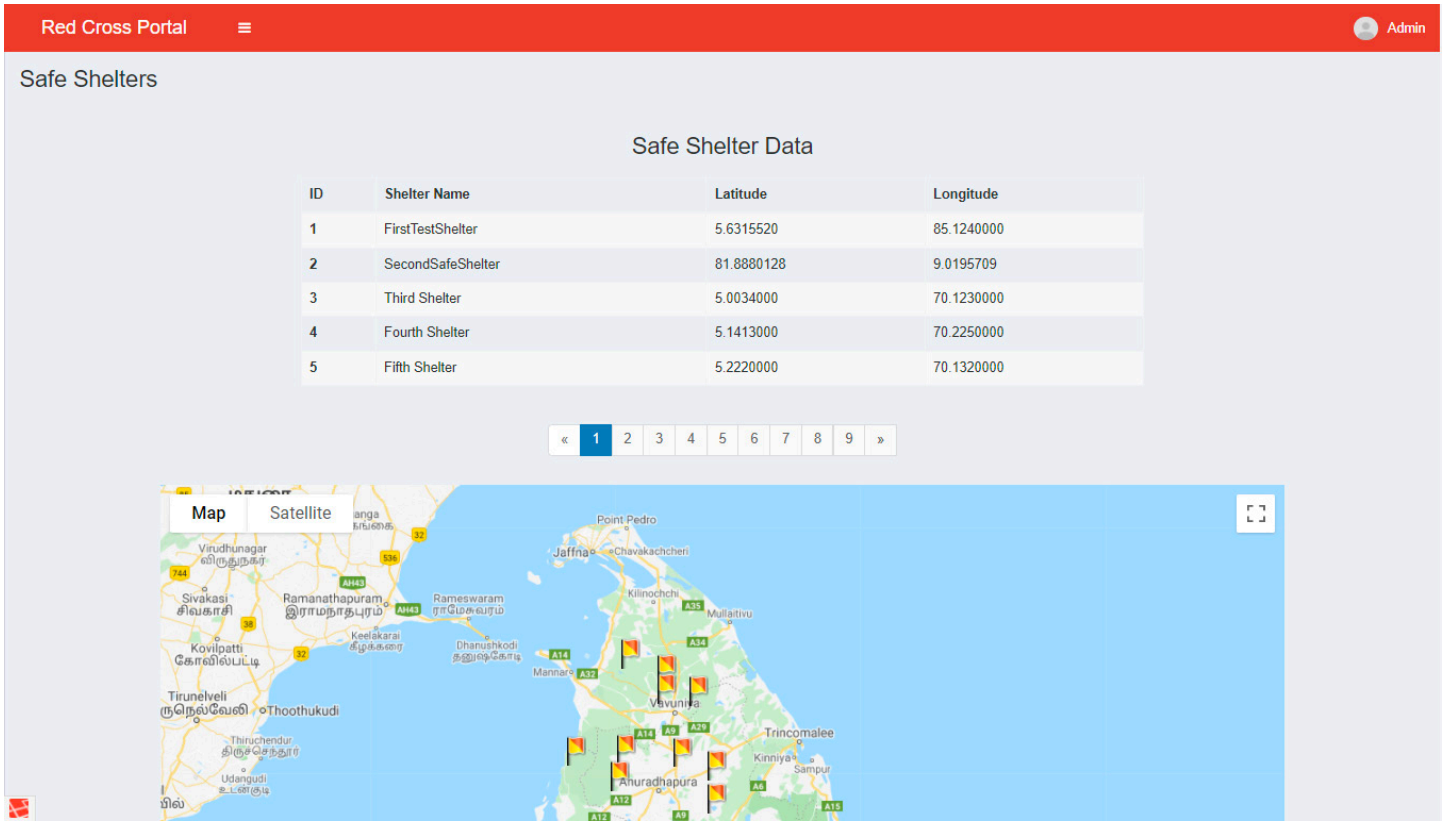



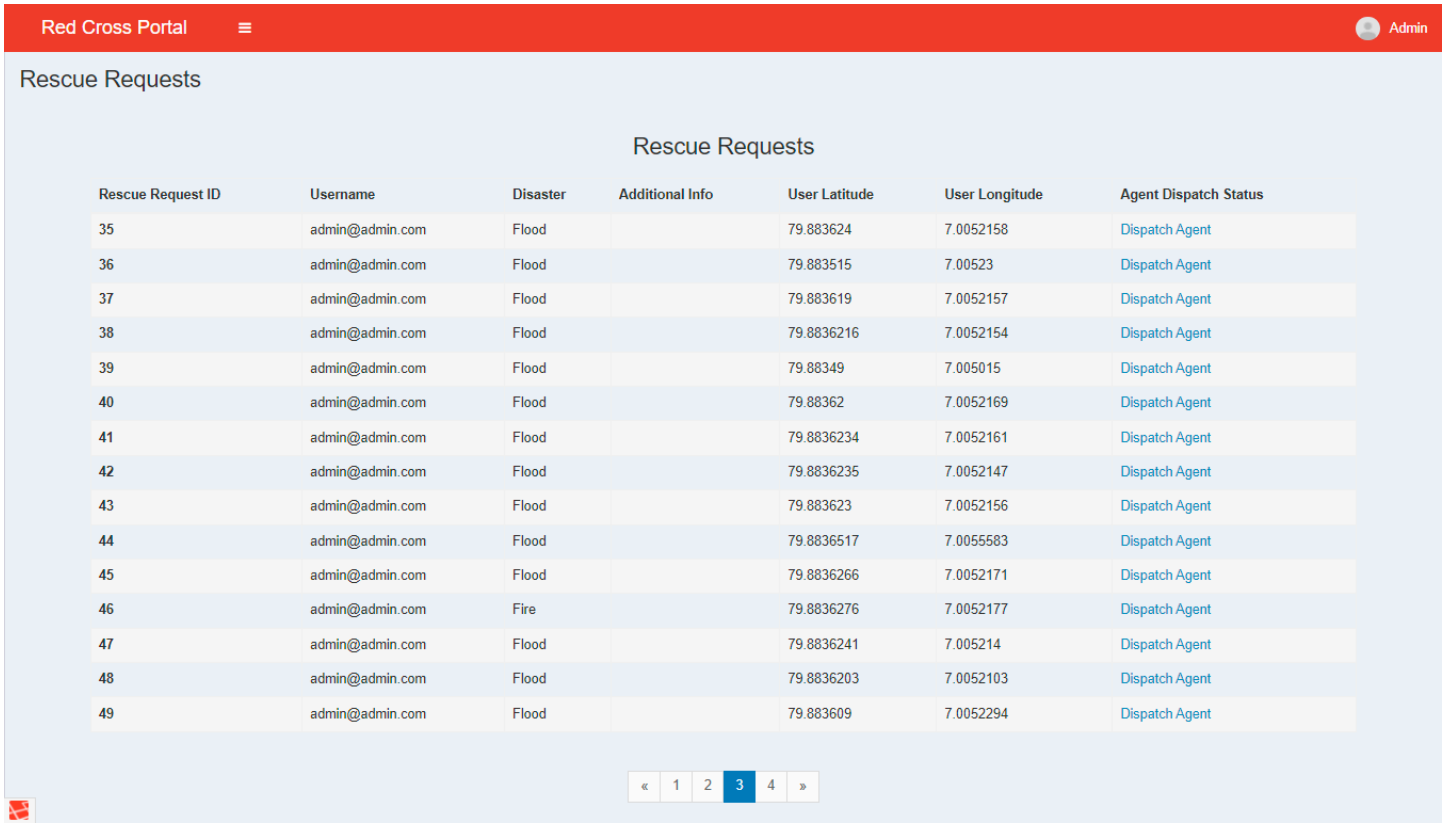



organize the relief operations and will certainly reduce the unnecessary convergence of the non-food items and cooked foods.

## Impact of this application:

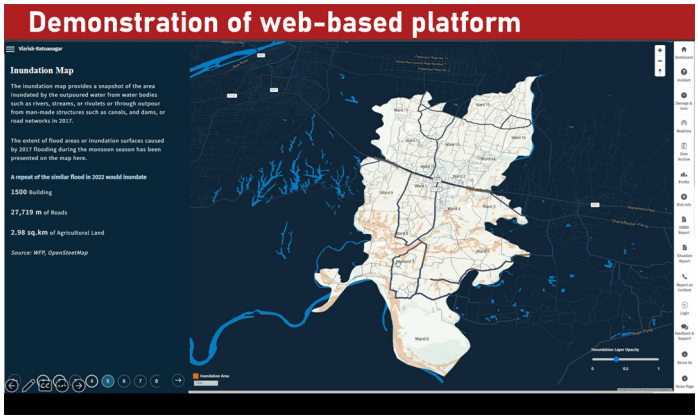
A Pilot Study will be launched in close coordination and with the assistance from the Government Stakeholders the SLRCS will select 25% of the frequently affected populations from Kolonnawa area as the area annually gets flooded during the Southwest Monsoon season. After the selection, training will be conducted with the support of the mentor, for both SLRCS volunteers and selected members of the community on the usage of the application.



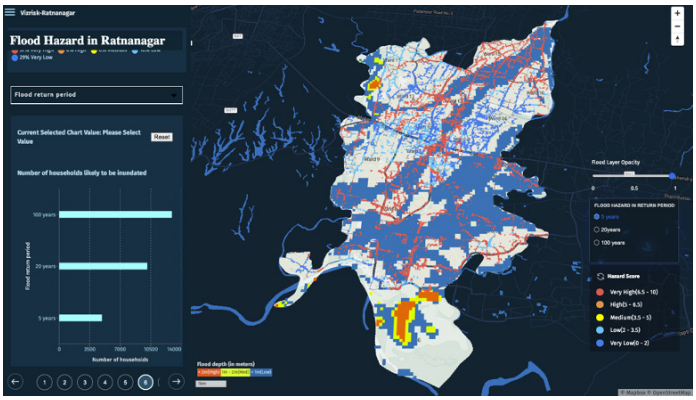



# VisRisk for Strengthening Inter-organizational Network (VISION) for DRRM

Youth Innovation Lab (YI-Lab) is a not-for-profit civic tech company, registered in Nepal. It works at the intersection of emerging cutting-edge technological tools and their applications by equipping young professionals to engage in emerging challenges. YI-Lab is a pioneer in developing and implementing an integrated and comprehensive Disaster Information Management System (DIMS) in Nepal in collaboration with the Government of Nepal.



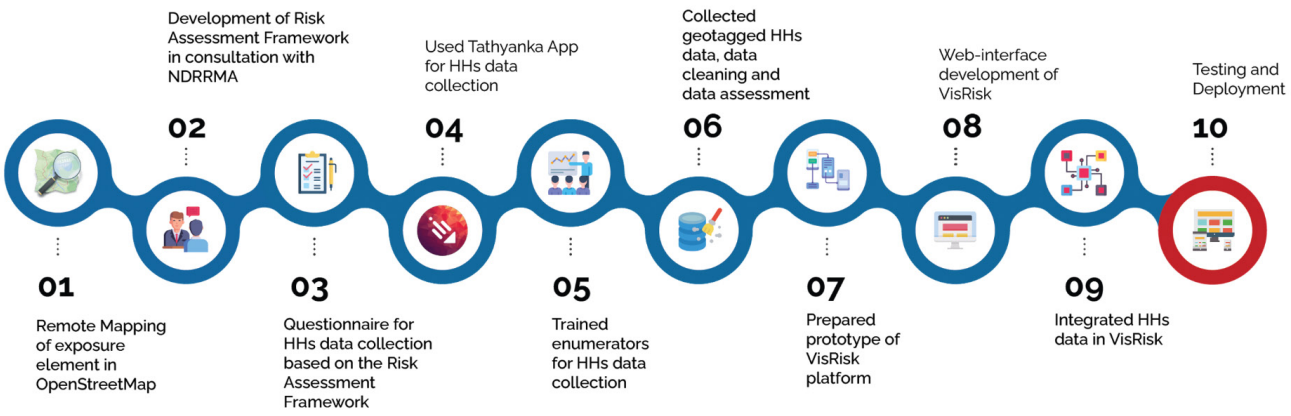

VisRisk is built into the Building Information Platform Against Disaster (BIPAD Portal), a national integrated Disaster Information Management System (DIMS) developed in 2019 by the Government of Nepal, Ministry of Home Affairs, and managed by the National Disaster Risk Reduction and Management Authority. BIPAD Portal as a digital web platform hosts disaster-related datasets from credible sources maintained by various ministries and departments of the Government of Nepal.



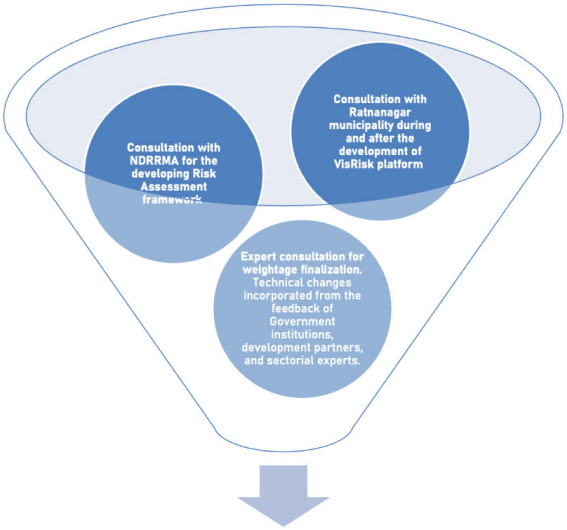

Screenshot of Visualizing Risk (VisRisk) platform developed within BIPAD Portal showing 1-in-5-year return period flood; a map shows the potential flood extent area along with potential flood depth in 1-in-5-year return period flood in Ratnanagar Municipality


Fifth page of VisRisk showing the inundated areas of a municipality in 2017 due to floods

## Solution Development Process



# Engagement with Stakeholders and Beneficiaries




Stakeholders Engaged in development and scaling of the solution.

## Engagement with other stakeholders

- **VisRisk was launched and demonstrated in the GPDRR 2022 conference held at Bali. Hundreds of people from around the world visited the demonstration.**
- **VisRisk platform has been demonstrated to more than 25 municipalities. New 12 local municipal institutions are willing to develop VisRisk platform.**
- **VisRisk has been demonstrated to APP National Partners and their feedbacks has been incorporated**

It accommodates data of different types such as warnings of heavy rainfall, floods, air pollution, and forest fires; incidents data; and near real-time data on water level, accumulated rainfall, and earthquakes. The portal also constitutes data on municipality disaster profiles along with hazard maps, exposure maps, vulnerability maps, climate change, and drought watch data.

VisRisk translates complex scientific disaster–related datasets into a simple visual format and helps users understand the risk and act based on it. It is an interactive tool to visualize data and information on hazard, exposure, and vulnerability for informed decision-making in Disaster Risk Reduction and Management. The platform is developed using state-of-art science and technology. VisRisk embeds a storytelling feature for the users to quickly grasp the key information. It combines text, photos, graphics, video effects, and animations to produce an engaging story on risk.

## Impacts / application:

- VisRisk of Ratnagaar has been a benchmark for the national showcase. NDRRMA has prioritized the development of VisRisk and localization of BIPAD Portal as a high priority.
- Mercy Crops and Nepal Red Cross Society has collaborated with YI-Lab for the household data survey for the development of VisRisk and Impact Based Forecasting (IBF). Same Risk Assessment Framework was used for household level data collection.
- Newly elected local municipal officials as well as ward level officials have been trained on using VisRisk for informed decision making.
- Full endorsement from Ratnanagar Municipality to use VisRisk for decision has been done. The prioritization of their intervention will be carried out to reduce risk by focusing on the household level.

The Asian Preparedness Partnership (APP) is a unique multi-stakeholder regional partnership established by its founding member countries which include Cambodia, Myanmar, Pakistan, Philippines, Nepal, and Sri Lanka. Formed in 2017 with technical and secretariat support from the Asian Disaster Preparedness Center (ADPC) as well as assistance from the Bill & Melinda Gates Foundation (the Foundation) and the United States Agency for International Development Bureau for Humanitarian Assistance (USAID BHA), its goal is to achieve "safer and well-prepared communities through locally-led disaster risk management (DRM) actions, so that disaster impacts on at-risk communities of Asia will be reduced".

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