ITU/WMO/UNEP Workshop on AI for Natural Disaster Management

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UNESCO's action on DRR

UNESCO DRR Activities around the globe

Europe
- ✓ Issue Based Coalition for Environment and Climate Change
- ✓ OPERANDUM (Nature based solution for DRR) in 7 countries
- ✓ RURITAGE (Rural Regeneration) in 6 countries
- ✓ SHELTER (Culture Heritage DRR) in 10 countries
- ✓ The Portuguese Sea and Atmosphere Institute (IPMA) as Tsunami Service Provider (TSP)
- ✓ Collective community management approach and capacity building activities in 6 countries

Arab
- ✓ Science and Technology Advisory Group for DRR
- ✓ Nature-based solution for natural hazards
- ✓ Atlas on Natural Hazards: A tool for socio-ecological system resilience in the Arab States
- ✓ Urgent Interventions to Build Socio-Ecological System Resilience to Natural Hazards in MENA region

ASIA and Pacific
- ✓ U-INSPIRE: young professional platform for DRR
- ✓ Science and Technology Advisory Group for DRR
- ✓ Disaster Risk Reduction and Management Training in Nepal
- ✓ International Workshop for Disaster Risk Reduction Knowledge Service in China
- ✓ Monsoon School on Urban Floods in India
- ✓ The South China Sea Tsunami Advisory Centre (SCSTAC)
- ✓ Landslide Early Virtual Observatories in Nepal

Latin America and Caribbean
- ✓ Science and Technology Advisory Group for DRR
- ✓ PRERADE (Risk governance) in Mexico
- ✓ Earthquake DRR in Lac5 (Built) in 5 countries
- ✓ VISUS (School) in Haiti, Peru, Dominican republic

- ✓ CARIDIMA Youth Platform: young professional network on DRR and CC in Caribbean SIDS)
- ✓ Guidelines for developing a National Strategy for DRR in the Caribbean Culture Sector
- ✓ Workshop on Climate Impacts & Vulnerabilities in Guyana
- ✓ Tsunami inundation and evacuation maps in 6 countries

Africa
- ✓ **AI Chatbot and SMS analysis for DRR in East Africa (STEDPEA)**
- ✓ Flood risk management in West Africa
- ✓ Earthquake early warning system in Ghana
- ✓ Post Hurricane Idai flood risk management
- ✓ Integrated DRR courses in Ethiopia
- ✓ Enhancing Climate Services for Improved Water Resources Management in climate sensitive Regions
- ✓ Strengthening of evidence-based decision and policy making in Gambia

Outline

Donor: Ministry of Foreign Affairs of Japan

- **Develop and pilot Mobile Applications (AI Chatbot)**   *In 5 countries in Eastern Africa (Kenya, South Sudan, Rwanda, Uganda, Tanzania)*
  AI chatbot enable sharing information on disasters and connecting communities to expedite relief efforts during disasters

- **DRR Policy Review**   *In 10 countries in Eastern Africa*
  Analyze current institutional, political and decision-support frameworks associated with DRR.

- **Develop Policy Recommendation**
  Inform policy actions for the development of DRR curriculum in disaster prone countries for higher education institutions

Two trials are undergoing
(1) AI Chatbot in collaboration with LINE and Weathernews Inc (Japan)

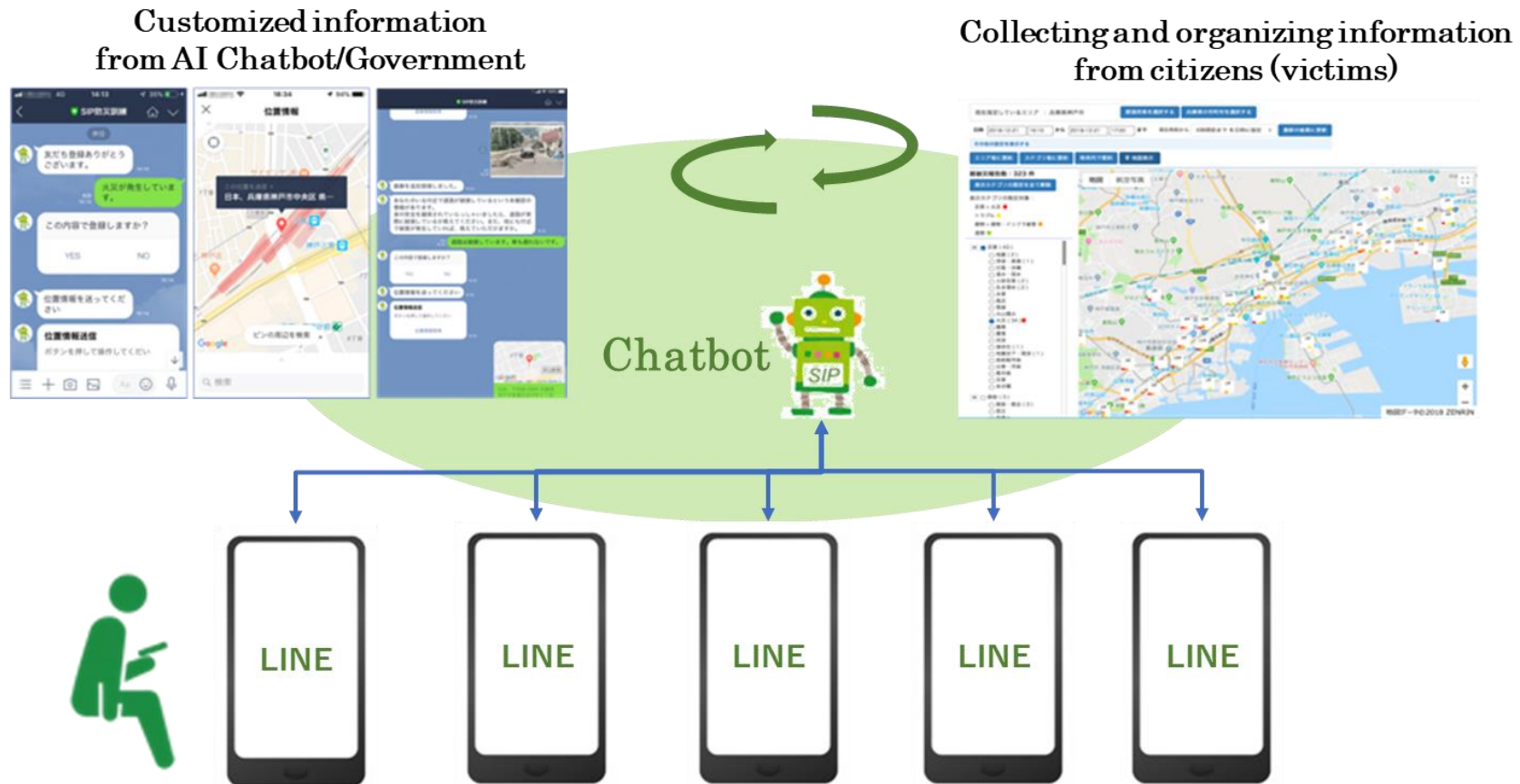(2) Social media analysis by AI in collaboration with Cititeats (Spain)

AI Chatbot

Government

How to get detailed info.?

TV is blackout

Cannot hear radio

No one answer the phone

Where to evacuate
How to get supplies?

When water & power
will be recovered?

Lack of resources (24h)

Too much calls

Website doesn't work

Information reaches
to all citizens?

Supply is enough?

Need specific info.
about damages

Citizen

Copyright @weathernews Inc

AI Chatbot (Overview)

Customized information from AI Chatbot/Government

Collecting and organizing information from citizens (victims)

Chatbot

LINE | LINE | LINE | LINE | LINE

- Optimize the communication between government and citizen
- Share the information of supplies and evacuation immediately
- Grasp the situation of damage/recovery accurately for both side
- Familiar communication tool helps to get information easily

AI Chatbot (in case of Japan)

Typhoon Faxai (T1915) has landed Chiba District next to Tokyo area on 9th September 2019. The maximum wind speed observed 57.5m/s which is the fastest ever at Chiba. There was a tremendous damage on building, transportation, water and power for living.

Responding the request from government, Council on Artificial Intelligence for Disaster Resilience has released the official LINE account for the people in Chiba to manage inquiries for the information related to the disaster AI Chatbot.

Function of the Chatbot

Functions for before hazards: It is important that the weather forecast and warning alert by the meteorological authorities are disseminated to the community and individual so that citizens are alerted to take necessary actions. AI Chatbot supports to disseminate the information to the citizen. During normal time, the citizens may report, via the AI Chatbot, landscape, changes or damages around the city. With this information, the national/local authorities can find damage before the hazards or be prepared to the severe damage during the hazards. General "life index information" is also considerable.

Functions for during hazards: During the natural hazard, the authorities needs to have a quick overview of the damage such as the intensity of the damage, geographical distribution of the damages. The AI Chatbot communicates with the users to collect the information with texts and photos and show them on the map. This will help the authorities to better grasp and react to the disasters, such as where to go to rescue and to know in advance damage on the infrastructure at the affected areas.

Functions for after hazards: It is crucial that the survivors from the hazards rehabilitate their lives quickly so that the society and economy go back to normal as soon as possible. In order to reach out to the survivors to inform the possible public support, the Chatbot communicates with the survivors who need assistance to rehabilitate their lives to find out the possible public support such as the location shelters, distribution of foods etc.

Function (before the hazard)

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Function (during the hazard)

Hazard Report & Record Mapping

It is flooding here

Thank you for information. Could you provide the location?

Provide GPS

Lamu Rd, Nairobi City, Kenya

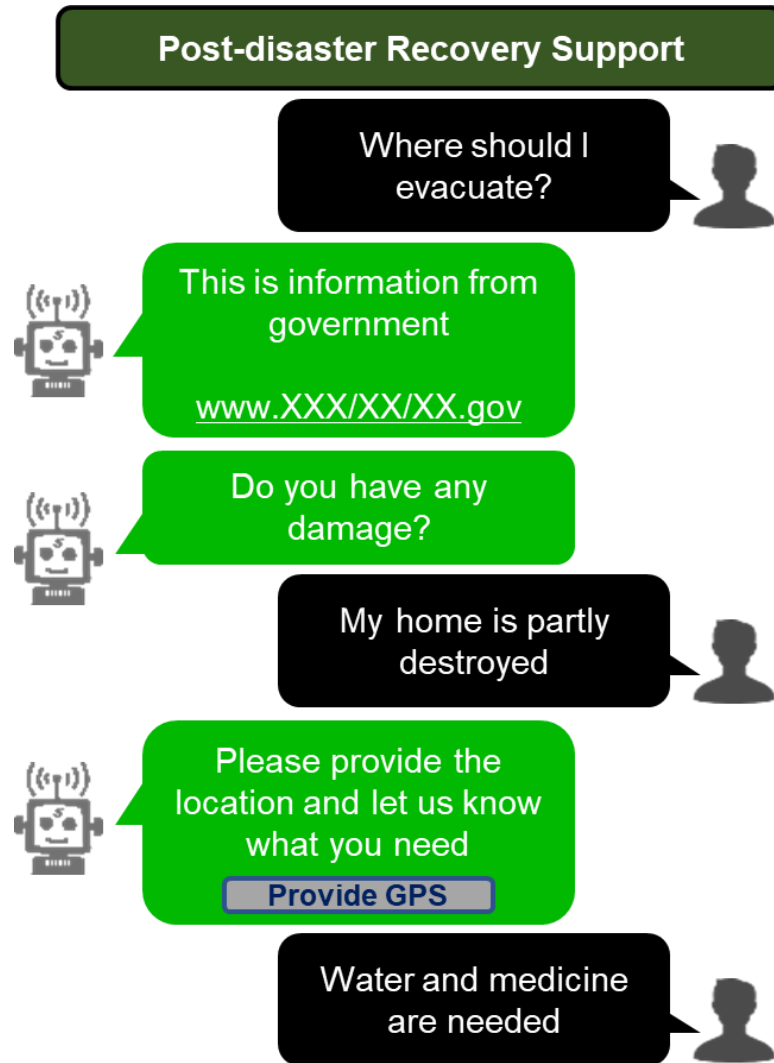Can you send a picture?

www.xxx.xxx.xxx.com
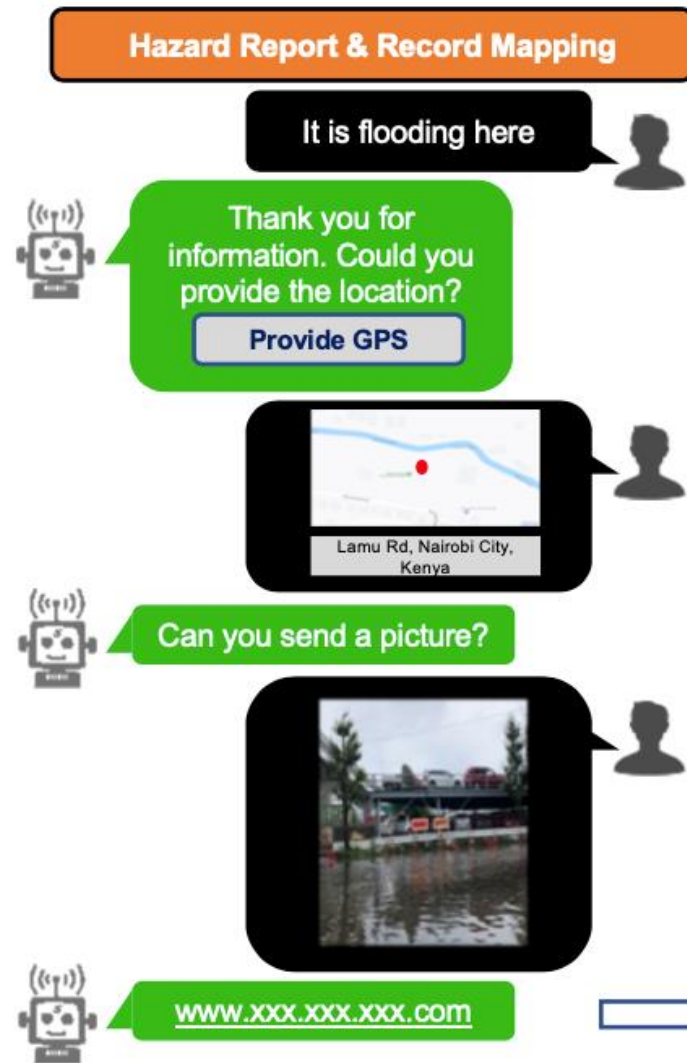
Realtime recording and mapping helps to grasp the disaster situation and safe evacuation.

Also the map is useful after the disaster to analyze the risk of hazard for the government.

Flood, Apr 07 2019, Lamu Rd, Nairobi City, Kenya
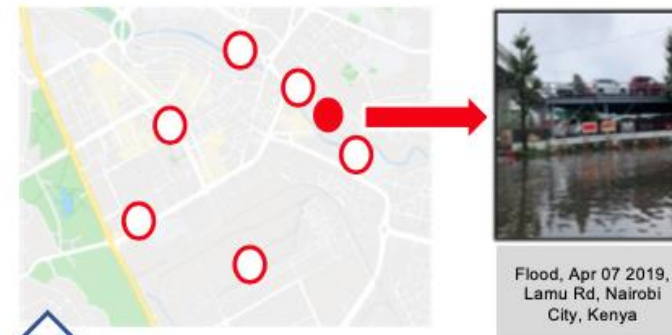
Copyright© Weathernews Inc. All rights reserved.

Function (after the hazard)

Post-disaster Recovery Support

Where should I evacuate?

This is information from government

www.XXX/XX/XX.gov

Do you have any damage?

My home is partly destroyed

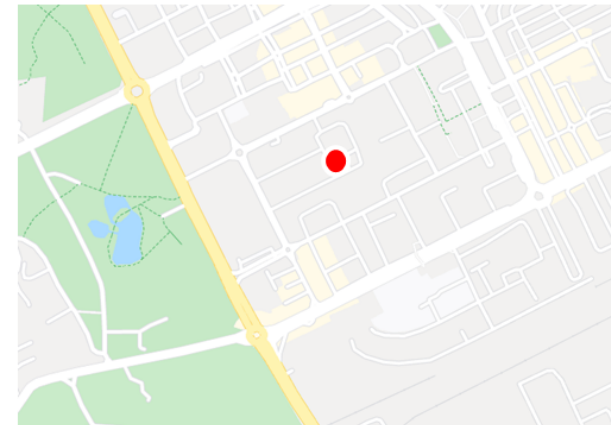Please provide the location and let us know what you need

Provide GPS

Water and medicine are needed

Victims may get a support for evacuation and recovery.

Government may grasp where the damage is and what people need.

It helps to plan for recovery after the disaster.

-1.2940379,36.8285106
Thu Apr 15 2020 15:06

Home is partly destroyed
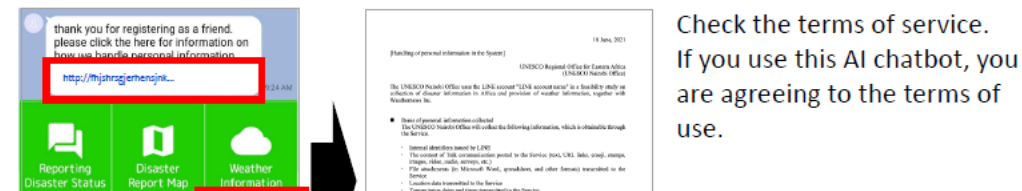Water and medicine are needed

AI Chatbot interface

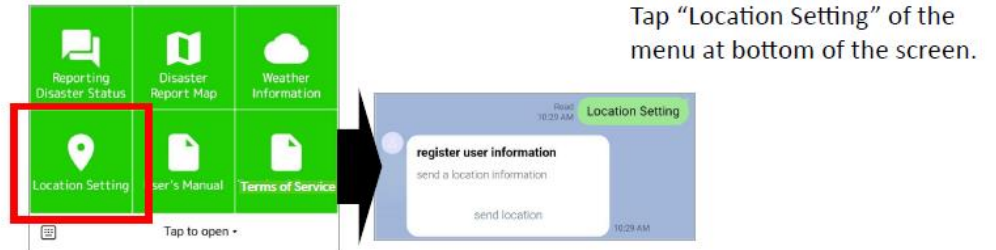## Friends registrasion

1. Friends registration

Read this QR, and make friends with your LINE account.

STEDPEA PROJECT

2. Confirmation of terms of service

Check the terms of service. If you use this AI chatbot, you are agreeing to the terms of use.

1. Start registration

Tap "Location Setting" of the menu at bottom of the screen.

2. Send location information

Scroll the map and align the pin where you want to register it.

Tap "Share location".

Japan TokyoChiyoda CityMarunouchi registered at the above address. thank you for registration. touch the menu icon at the bottom left of the screen to return to the menu screen

AI Chatbot Interface

3. Send a disaster location photo

Tap "camera launch" or "camera roll".

Please send a disaster location photo.

4. Final confirmation

If there are no mistakes in the contents, tap "register disaster information".

Other : AI chatbot answers questions

If you have any questions about disaster relief, the AI chatbot will answer.
In that case, it is necessary to specify the name of the country as in the example.

unesco

Pilot testing in East Africa

AI Chatbot (Administration page)

STEDPEA PROJECT Administration   LOGOUT

Disaster reports - List

| Please select ▾ | Keyword search | | | PUSH | RESET | CONDITIONS CHANGE | DOWNLOAD |

Send	ID	Belongs	Posted prefectures	Posted location	Category	Message	Image file name	Creation date and time	
☐	416			Zanzibar Tanzania	Reports	Flooding.	f195c389-d104-41c3-a029-352476440303-not-send-request_14603998237313.jpg	2021-08-20 09:08:23	MORE DETAIL / CHECK THE MAP
☐	414			Unnamed Road, Kinigi, Rwanda	Reports	The earthquake caused damages in Musanze District where 6houses have been destroyed..	25b64c8e-214d-4003-b1cc-400880c08d57-not-send-request_14600126398828.jpg	2021-08-19 15:33:56	MORE DETAIL / CHECK THE MAP
☐	412			Zanzibar Town Tanzania	Reports	There is fireoutbreak at mwana ..	d22ffc0a-e81b-40c0-af5a-c302649511b8-not-send-request_14599405253130.jpg	2021-08-19 13:19:59	MORE DETAIL / CHECK THE MAP
☐	410			Near Protea Zanzibar Tanzania	Reports	Heavy rainfull.	b3d12f49-1076-43bf-b43c-853d304246c9-not-send-request_14598992270116.jpg	2021-08-19 11:58:50	MORE DETAIL / CHECK THE MAP
☐	408			Near Protea Zanzibar Tanzania	Reports	Flood outbreak at madinat albahar .. .	a44fc207-df17-4780-91f6-1b63be1c4648-not-send-request_14598990953314.jpg	2021-08-19 11:58:35	MORE DETAIL / CHECK THE MAP
☐	406			Near Protea Zanzibar Tanzania	Reports	Heavy rain.	7c29f670-3f05-49c6-8e31-d8f3d0f76364-not-send-request_1459	2021-08-19 11:57:28	MORE DETAIL

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AI Chatbot (Administration page)

Project background

→ **Challenge:**

Understand the needs and concerns before, during and after a natural disasters in Kenya, Rwanda, South Sudan, Tanzania, Uganda.

The main objectives of this project are:
- Understand retrospectively how the population in these countries react to natural disasters through social media
- Reveal how these societies organize and cope during this stressful periods of time

→ **Approach:**

Identifying people's needs and concerns during previous disasters through alternative data sources and AI analysis. Citibeats specializes in understanding social risks, using NLP and machine-learning. Our multi-language technology allows us to build AI-based models in a matter of hours, which allow us to understand social changes.

SMS analysis by AI

Project Approach

1. Disasters to be analyzed:

- Rwanda:
  - Mudslide April 2021
  - Floods Dec 2019
  - Floods mar 2018

- Tanzania
  - Tropical Cyclone, Flash floods April 2021
  - Floods Apr 2020
  - Floods oct 2019
  - Floods Jan 2020
  - Floods May 2019
  - Tropical Cyclone Kenneth Apr 2019
  - Floods Apr 2018

- Kenya
  - Floods April - May 2021
  - Floods, Landslides Apr 2020
  - Floods, Landslides oct 2019
  - Floods mar 2018

- South Sudan
  - Floods Aug 2020
  - Floods June 2019

- Uganda
  - Floods, Landslides may 2020
  - Floods, Landslides oct 2019
  - Floods, Landslides jun 2019

Social Perceptions to be automatically categorized for insight detection

- 🟨 01 Natural Hazards Information
- 🟩 02 Emergency Response
- 🟦 03 Infrastructure And Transport
- 🟪 04 Health System
- 🟥 05 Education System
- 🟧 07 Employment And Economy
- 🟩 08 Vulnerable Population