

# MessageStack-SOS

## Introduction

The purpose of MessageStack-SOS is to enable those affected by a humanitarian disaster to obtain on-demand information, using AI-enabled chat via SMS messages.

SMS is used because it is more resilient than the data network, which can be rendered useless by:

1. Overloading of the network (by those affected seeking information)
2. Damage to data network infrastructure

These issues can be mitigated because SMS supports store-and-forward i.e. messages are queued until they can be delivered.

In addition, many carriers prioritise SMS over data during congestion, which means SMS will work when voice/data are not available.

## How does it work?

MessageStack-SOS generates responses by combining content that is owned and managed by the aid agency, in a dedicated Content Management System.

In addition, Geolocation is used to calculate the nearest appropriate resource to the user.

The following types of content can be managed:

- Hospitals, clinics and any healthcare provider.
- Medical conditions, most relevant to the disaster.
- Emergency accommodation.
- Events, such as water or food distribution.
- Announcements, such as: epidemic warnings, health and safety announcements, weather forecasts or travel alerts, etc.
- Emergency services, such as fire, police, rescue, etc.
- Government buildings for civil matters, such as aid registration.
- Contact Points, for national telephone helplines.

**Aid agencies have full control of their own content in the Content Management System and can therefore keep content up-to-date, in real-time.**

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## Dynamic Translation

The content managed by the aid agency can be in any language. However, MessageStack-SOS will answer in the same language used for the question – there is no need for manual translation – it is dynamic.

For example, here is the later “weather forecast” scenario dynamically translated into Urdu:

Question in Urdu:

پانی کب نیچے جائے گا تاکہ میں اپنی زمین دیکھ سکوں؟

Response from MessageStack-SOS:

موسمی پیشگوئی کے مطابق سندھ میں اگلے 7 دن شدید بارشیں ہوں گی اور پانی مزید بڑھے گا۔ تین ہفتوں بعد بارشیں کم ہو جائیں گی اور سیلابی پانی اتر جائے گا، اس کے بعد آپ اپنی زمین دیکھ سکیں گے۔

## The 2022 Pakistan Floods

The content used for these scenarios is based on real-world data from the 2022 Pakistan floods, which were one of the most devastating natural disasters of the past decade in terms of people affected and humanitarian impact.

Between June and October 2022, Pakistan was hit by unprecedented monsoon rainfall that combined with glacial melt and a severe heatwave to inundate vast areas of the country. This led to what many officials and observers described as the worst flooding in Pakistan’s history.

- 33 million people affected — about 12–15 % of Pakistan’s population.
- Over 2 million homes damaged or destroyed.
- 8 million people displaced from their homes.

## Common Questions Asked by Survivors

These are the most common questions asked by survivors in the immediate aftermath of the flooding:

1. How can we find missing family members?
2. Where can my family sleep tonight that is dry and safe from the water?
3. Is there a safe place for the women to go?
4. Where is the clean water?
5. Where is the nearest medical help or clinic?
6. How can I access emergency money?

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7. When will the water go down so I can see my land?

## Scenario Testing

The following sections demonstrate actual responses from MessageStack-SOS, based on the common questions asked by survivors:

### 1. How can we find missing family members?

Communication lines were down, and bridges were washed away. The psychological trauma of missing family members often eclipsed physical hunger in the first 72 hours.

In this scenario, MessageStack-SOS combines: Geolocation and an emergency service.

I cannot find my daughter

...Where are you now?

Jacobabad

...Contact Rescue 1122 Rural Search and Rescue Unit – Jacobabad for emergency help in locating your daughter. Address: Rescue 1122 RSAR Unit, Jacobabad, Sindh, Pakistan. Telephone: 1122.

In this scenario, MessageStack-SOS combines: Geolocation and emergency accommodation (that can provide missing-person information)

How can we find missing family members?

...Where are you now?

Dadu

...To find missing family members in Dadu, visit the Dadu District Government Relief Camp at 29-31, Civil Hospital Road, Dadu, Sindh Province. The camp provides registration and information about missing people. Open 24/7 during emergencies.

In this scenario, MessageStack-SOS provides Missing Persons hotlines.

Who can I call to find my son?

...To find your son, call the Edhi Foundation Missing Persons Helpline at +92 (21) 32413232 or 115, or contact the Sukkur City Police Station at 15. You can also reach the NDMA Floods Emergency Helpline at 051 111 157 157 for assistance.

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## 2. Where can my family sleep tonight that is dry and safe from the water?

Families need to know where evacuation shelters or safe high-ground camps are located. In this scenario, MessageStack-SOS combines: emergency accommodation, distance calculations and road-closure announcements.

I am in Shikarpur. Where can my family sleep tonight that is dry and safe from the water?

...Your family can stay at Sukkur Relief School Shelter, Sukkur, Sindh, Pakistan, open 24/7 with dry classrooms and communal meal area. Alternatively, Jacobabad Community Hall Shelter, Jacobabad, Sindh, Pakistan, offers indoor shelter and shared meals, open all hours.

How do I get to Sukkur?

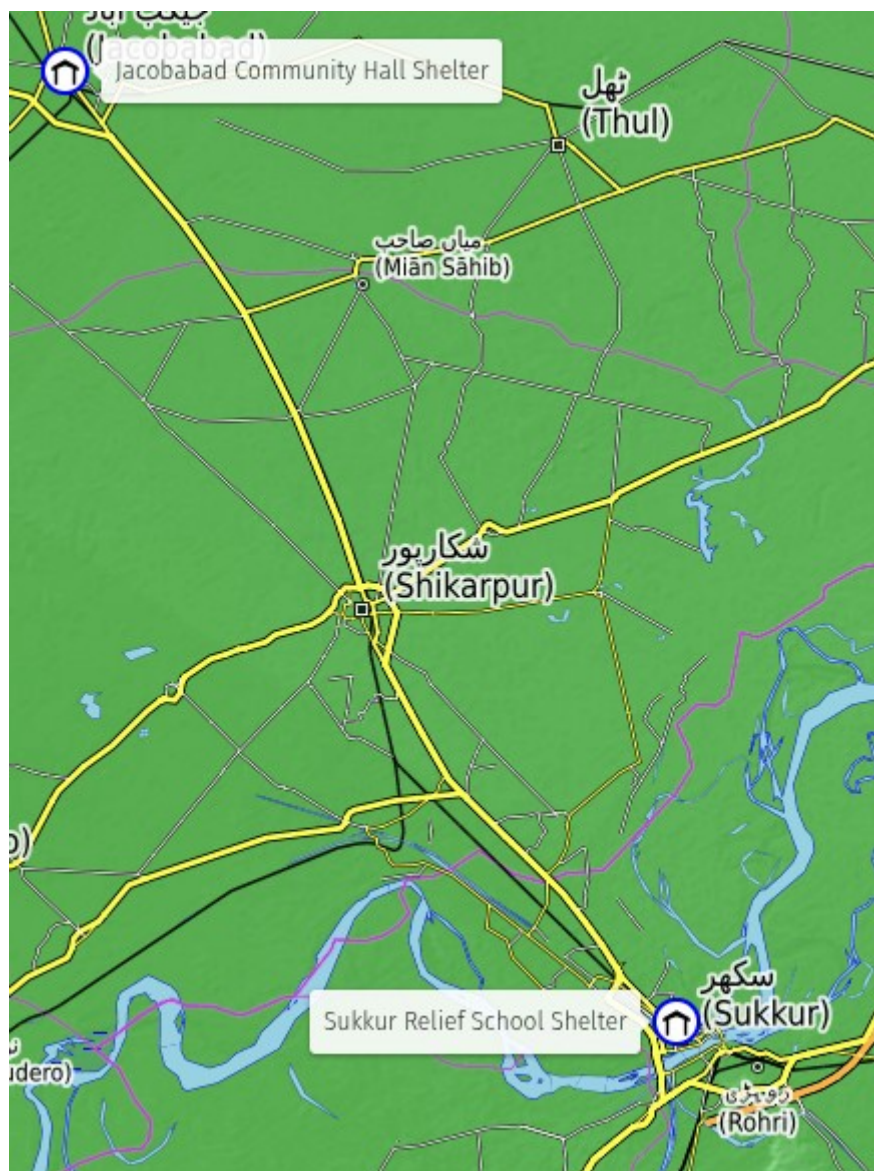
...The N-65 highway between Sibi and Shikarpur is closed due to flooding, and all public bus transport from Sibi and Shikarpur has been cancelled. Do not attempt to travel on the N-65 highway from Sibi to Shikarpur.

...How long will it take to walk to Sukkur Relief School Shelter?

Walking from Shikarpur to Sukkur Relief School Shelter will take approximately 8 hours. The shelter is located in Sukkur, Sindh, Pakistan, and is open 24/7 during flood relief operations. Address: Sukkur, Sindh, Pakistan. Telephone: Not available.

This is perfect because the Sukkur Relief School Shelter is the closest emergency accommodation to Shikarpur (see map below):

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In addition, the response combines a relevant road closure and can advice on walking times.

### 3. Is there a safe place for the women to go?

In a conservative and modest society, the lack of private latrines and segregated spaces was a crisis of dignity for women and girls.

In this scenario, MessageStack-SOS combines: knowledge of female-only emergency accommodation and distance calculations, in a multi-step conversation.

I am in Moro. I am a lone female and need help

...If you are a lone female in Moro and need help, the Dadu District Government Relief Camp offers emergency shelter, food, and missing person information. Address: 29-31, Civil Hospital Road, Dadu, Sindh Province. Open 24/7 during emergency response.

I need a female-only place to stay

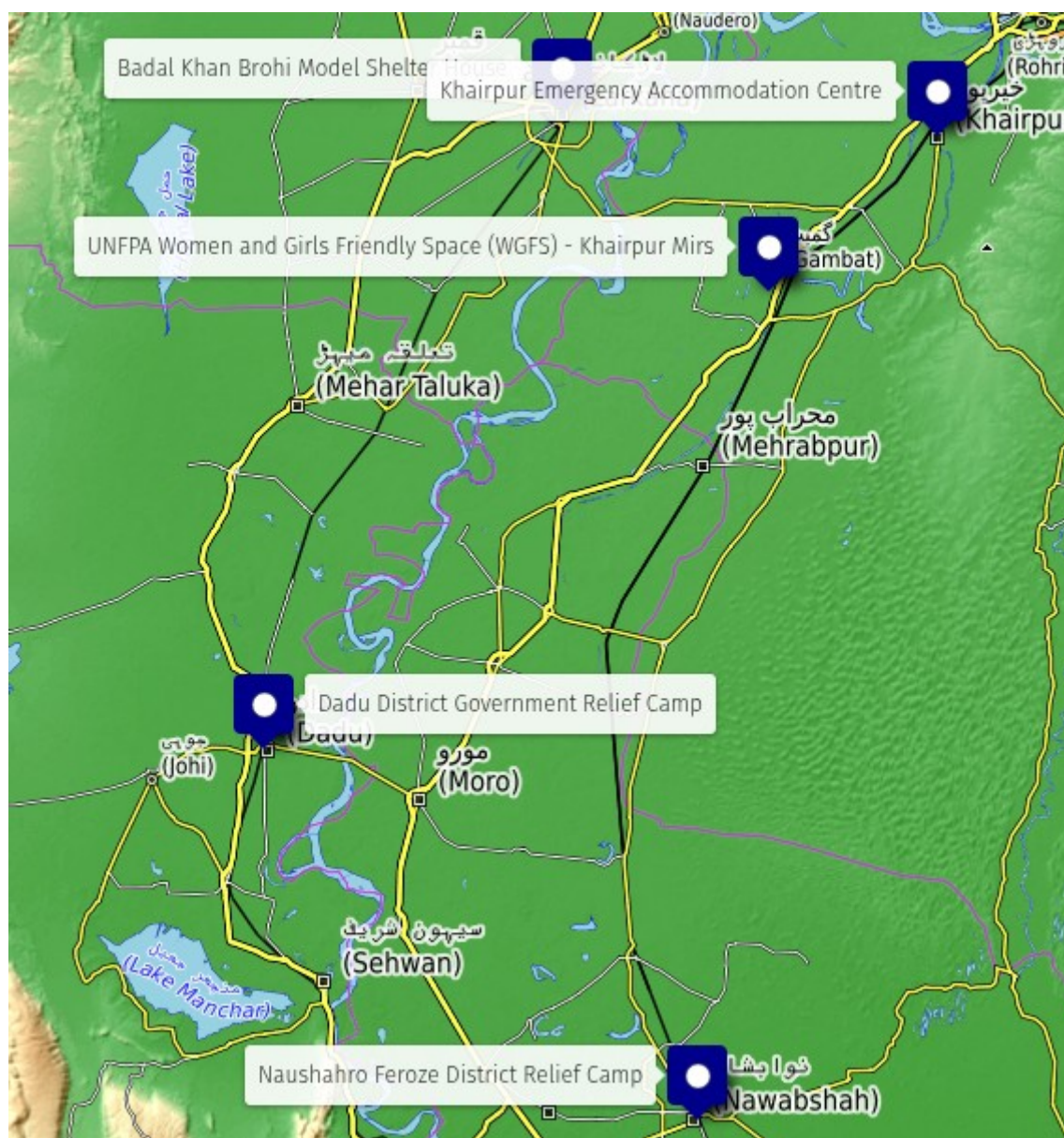
...A lone female in Moro can find a female-only place to stay at the UNFPA Women and Girls Friendly Space (WGFS) - Khairpur Mirs. Address: District Headquarters (DHQ) Displacement Cluster, Khairpur Mirs, Sindh, Pakistan. No telephone provided.

When does it open?

...The UNFPA Women and Girls Friendly Space (WGFS) in Khairpur Mirs, Sindh, Pakistan is open from 08:00 to 18:00. Address: District Headquarters (DHQ) Displacement Cluster, Khairpur Mirs, Sindh, Pakistan. No telephone provided.

In the map below, you can see that MessageStack-SOS has recommended the nearest UNFPA Women and Girls Friendly Space:

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#### 4. Where is the Clean Water?

With the Indus overflowing and sanitation systems destroyed, drinking water became a poison. Without clean water, cholera and dysentery began killing survivors within days.

In this scenario, MessageStack-SOS combines: a water distribution event, distance calculations and a relief camp (another source of clean water)

Where can I get clean water?

...Where are you now?

Badin

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...You can get clean water at the Emergency Water Distribution - Matli, held at Aga Khan Laboratory Matli on 2026-04-09 from 06:00 to 10:00. For shelter and basic services, visit Matli Flood Relief Tent Camp, Matli, Badin District, Sindh.

## 5. Where is the nearest medical help or clinic?

Injuries, infections, pregnancy complications, and disease outbreaks often surge after floods.

In this scenario, MessageStack-SOS combines: medical condition information, geolocation and healthcare provider data.

I have bad vomiting and really bad headaches. What do I have?

...Vomiting and severe headaches can be symptoms of dengue fever, cholera, or leptospirosis. These conditions require prompt medical attention. Seek care at the nearest health facility for diagnosis and treatment.

Where is the nearest?

...Where are you now?

Dadu

...The nearest health facility in Dadu is the Mobile Medical Clinic operated by Médecins Sans Frontières at Mastoi Muhalla Mastoi Mohalla, providing essential healthcare services. No telephone number is listed.

## 6. How can I access emergency money?

The Benazir Income Support Programme (BISP) provided immediate cash, but you needed documentation. Losing your papers in the mud meant losing your only path to financial recovery.

Replacement ID cards were issued by mobile National Database and Registration Authority (NADRA) vans.

In this scenario, MessageStack-SOS combines: Geolocation, a Government building for registration and two Registration Authority (NADRA) mobile registration events. The nearest registration event is found.

I lost my ID card, can I still get government money?

...If you lost your ID card, you must visit a NADRA Mobile Registration Van or a NADRA

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Registration Center to get a replacement CNIC before applying for government cash assistance like BISP. Address and helpline: Local Board Rd, near Nadira Center, Sukkur, +92-51-111-786-100.

Where is the nearest van?

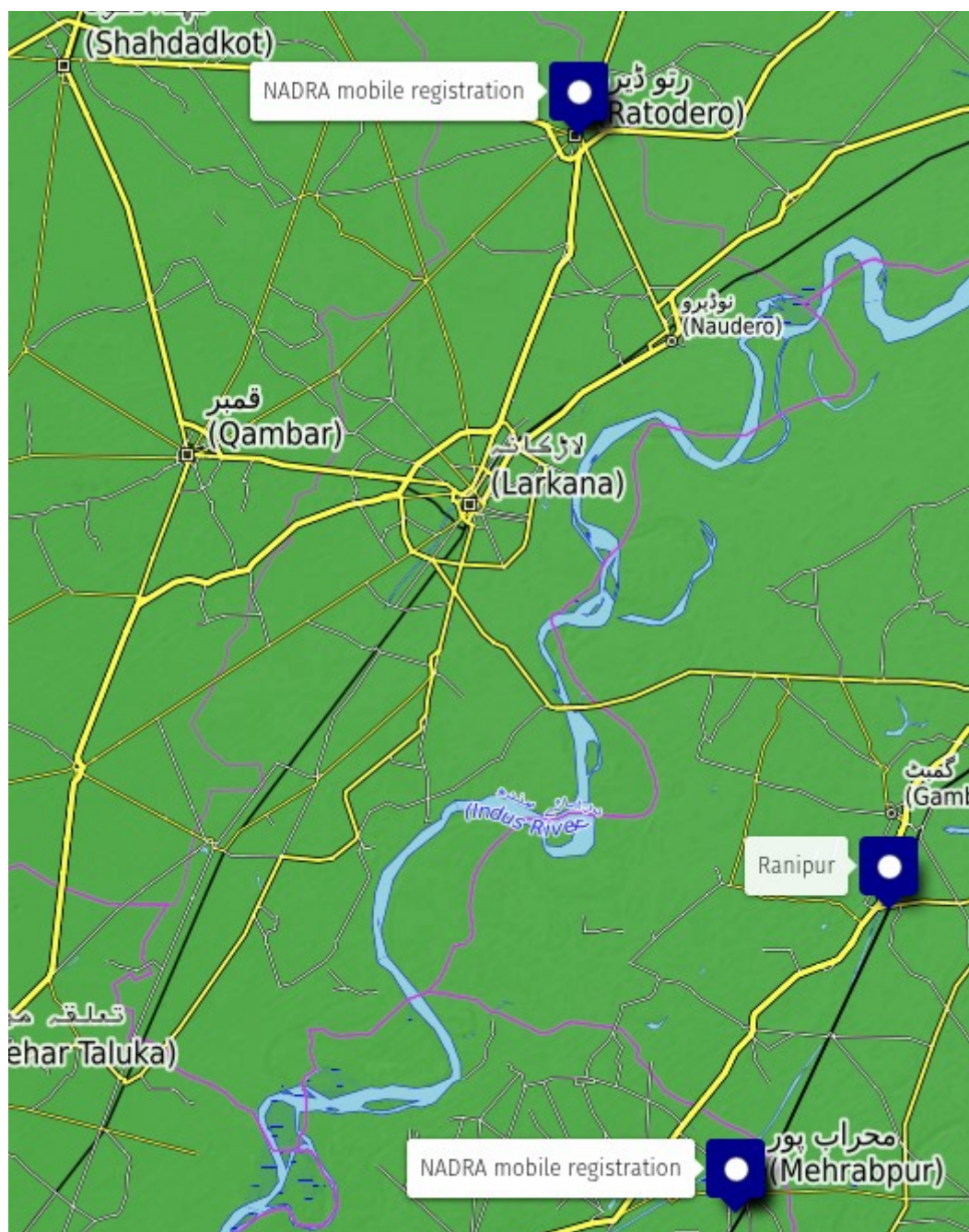
...The nearest NADRA Mobile Registration Van in Sukkur is not currently scheduled. For expedited CNIC services, visit the NADRA Registration Center at Local Board Rd, near Nadira Center, Sukkur. Telephone: +92-51-111-786-100 (NADRA National Helpline: Dial 1777).

I am in Ranipur

...The nearest NADRA Registration service in Ranipur is the NADRA mobile van at Faqir Muhammad Arain Primary School, Mehrabpur. For expedited CNIC services, visit the NADRA Registration Center at Local Board Rd, near Nadira Center, Sukkur. Telephone: +92-51-111-786-100.

The map below shows the location of the two registration events, and the user's location:

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## 7. When will the water go down so I can see my land?

This wasn't just curiosity. Farmers needed to know if they could plant the next crop or if they were facing a total loss of their annual income.

In this scenario, MessageStack-SOS responds by combining a weather forecast announcement with the National Disaster Management Authority (NDMA) and Sindh Provincial Disaster Management Authority (PDMA) helplines.

When will the water go down so I can see my land?

...Flood waters are expected to rise over the next 7 days due to torrential rain. In 3 weeks, rainfall will diminish and flood waters are expected to dissipate, making your land visible. For updates or assistance, contact NDMA at 051 111 157 157 or Sindh PDMA at 1137.

## **Acknowledgments**

Maps used in this document were produced from Open Street Maps ([www.openstreetmap.org](http://www.openstreetmap.org)). Map markers were generated using uMap ([umap.openstreetmap.fr](http://umap.openstreetmap.fr)).

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