

510



An initiative of
the Netherlands
Red Cross



Use of space-based technologies in humanitarian contexts

Angelina Savchuk
GIS and Remote Sensing Analyst

asavchuk@redcross.nl

8 December 2022

510



An initiative of
the Netherlands
Red Cross

Red Cross movement
who we are
themes and topics
our way of working
how we started
products and services
anticipatory action
emergency support
landscape restoration

International Red Cross and Red Crescent Movement

The world's largest humanitarian network made up of three parts



The International Committee of the Red Cross, ICRC

- Operates worldwide helping people affected by conflict and armed violence.
- Promotes the laws that protect victims of war. Is an independent and neutral organisation.

The International Federation of the Red Cross and Red Crescent Societies, IFRC

- Co-ordinates international relief provided by National Societies for victims of natural disasters and refugees and displaced persons outside conflict zones.
- Supports National Societies plan and implement disaster responses and development projects in local communities.



The National Red Cross and Red Crescent Societies

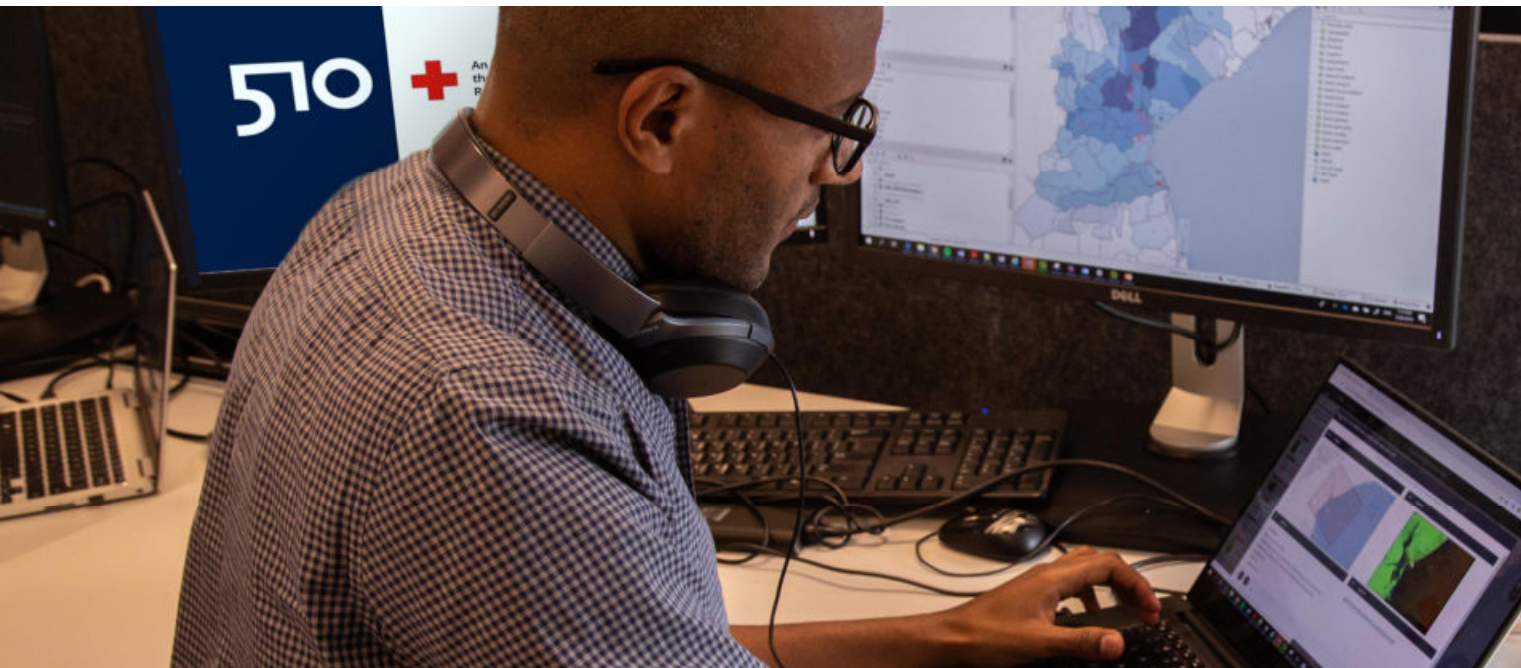
- Each Society has a responsibility to help vulnerable people within its own borders, and to work in conjunction with the Movement to protect and support those in crisis worldwide.



192
National Societies

510: The Netherlands Red Cross' Data & Digital initiative

510 is the data & digital initiative of The Netherlands Red Cross. Named after the total surface area of the earth (510 million square kilometers), 510 aims to help every Red Cross and Red Crescent National Society in need anywhere. 510's purpose is to improve speed, quality and cost-effectiveness of humanitarian aid by creating products and services using data and digital. 510 started in March 2016 with core team of 3 and never stopped growing. Currently, 510 has 108 team members of whom 72 professional volunteers.



510



An initiative of
the Netherlands
Red Cross

The **themes** we work on

510's works on the themes below. How 510 works on each theme is showcased on the next page. Each topic has its own products and services that can be found further in this information deck.



Anticipatory Action



Cash Aid



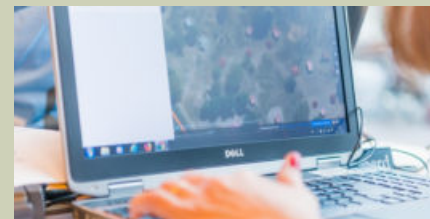
Digital Transformation



Emergency Support



Water & Landscape



Our way of working

Our themes and topics



Anticipatory Action

- Impact Based Forecasting
- Understanding the Risk



Cash Aid

- Digital Cash Aid
- Direct Digital Aid



Digital Transformation



Emergency Support



Water & Landscape

- Landscape Restoration
- Data for Water



Our way of working

- Community Engagement and Accountability
- Human Centered Design
- Data & Digital Responsibility
- Volunteers
- Academic Research

Our way of working

- With and for National Society
- Open-source based tools
- Open data
- <https://github.com/rodeknuis>
- Data Responsibility
- Do No Harm
- Embracing voluntarism
- Also in data scarce regions
- Leveraging the power of AI
- Making technological advancement accessible to humanitarians

The screenshot shows the GitHub profile page for the Netherlands Red Cross. The profile header includes the organization's name, a red cross logo, and statistics: 16 followers, located in the Netherlands, with a website link to https://www.rodeknuis.nl. The navigation bar shows 'Overview' as the active tab, along with 'Repositories' (115), 'Projects' (1), 'Packages', and 'People' (5). The 'Pinned' section displays six repositories:

- IBF-system** (Public): Tools required to trigger, manage and execute the Red Cross Early Action Protocols for natural disasters. Languages: TypeScript (9 stars, 15 forks).
- Typhoon-Impact-based-forecasting-model** (Public): Typhoon Impact forecasting model. Languages: Jupyter Notebook (12 stars, 11 forks).
- CommunityRisk** (Public): The Community Risk Assessment dashboard is a data-driven solution to identify the geographic areas that are most affected by a humanitarian disaster or crisis and the individuals that are most in n... Languages: JavaScript (11 stars, 6 forks).
- automated-building-detection** (Public): Automated Building Detection using Deep Learning. Languages: Python (68 stars, 20 forks).
- caladrius** (Public): Forked from gulfaraz/caladrius. Automated Damage Assessment using Deep Learning. Languages: Python (9 stars, 8 forks).
- helpful-information** (Public): A web-app People Affected can use to lookup useful organizations and information. Languages: TypeScript (1 star, 1 fork).

The 'Repositories' section is visible below, with a search bar and filters for 'Type', 'Language', and 'Sort'. The first repository shown is **GlobalTropicalCycloneModel** (Public), described as a 'Global model to predict the Impact of Tropical cyclone', using Jupyter Notebook, with 0 stars, GPL-3.0 license, 0 forks, 10 watchers, and 4 issues. It was updated 9 hours ago.

510



An initiative of
the Netherlands
Red Cross

How it started

2017 Hurricane Irma in Caribbeans

1. 4th of September 2017 promoted to a CAT 4 storm
2. In the night of the 5th to the 6th of September the Dutch side (South side) of the island was mapped and validated at 95%.
3. Landfall on the 6th of September 2017
4. By 6 PM 6th September the **whole island** was mapped by remote volunteers

More than 5600+ buildings were added to OpenStreetMap

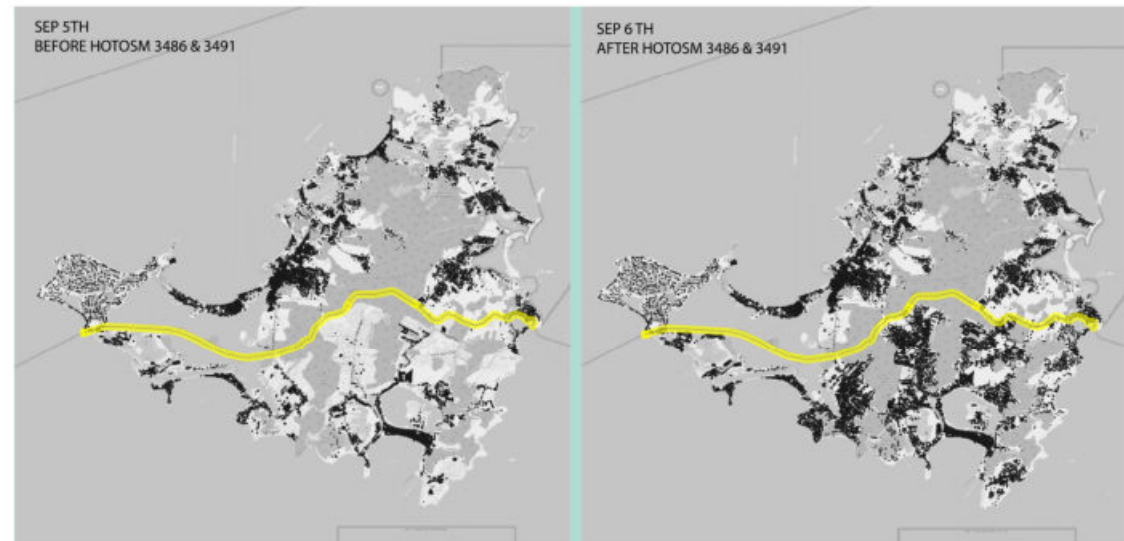


SINT MAARTEN & SAINT MARTIN MAPPED

6 SEP 2017

510 Global sets HOTOSM tasks
#3486 for south (Dutch) side of island
#3491 for north (French) side of island
Collectively adding 5683 new buildings.

Sources: 510GLOBAL, Hotosm tasks



The maps used do not imply the expression of any opinion on the part of the International Federation of Red Cross and Red Crescent Societies or National Societies concerning the legal status of a territory or of its Authorities. Produced by 510 An initiative from the Netherlands Red Cross. Base map: OpenStreetMap
CONTACT: support@510.global



An initiative of
the Netherlands
Red Cross

2016 Hurricane Irma

Using satellite & drone imagery

Damage assessment St. Maarten

Date : 12 September 2017

The maps used do not imply the expression of any opinion on the part of the International Federation of Red Cross and Red Crescent Societies or National Societies concerning the legal status of a territory or of its authorities.

Produced by 510 An Initiative from the Netherlands Red Cross, St. Maarten Red Cross.

Sources: OpenStreetMap, Copernicus Emergency Management Service, GIS POPULATION GRID 30C

Legend

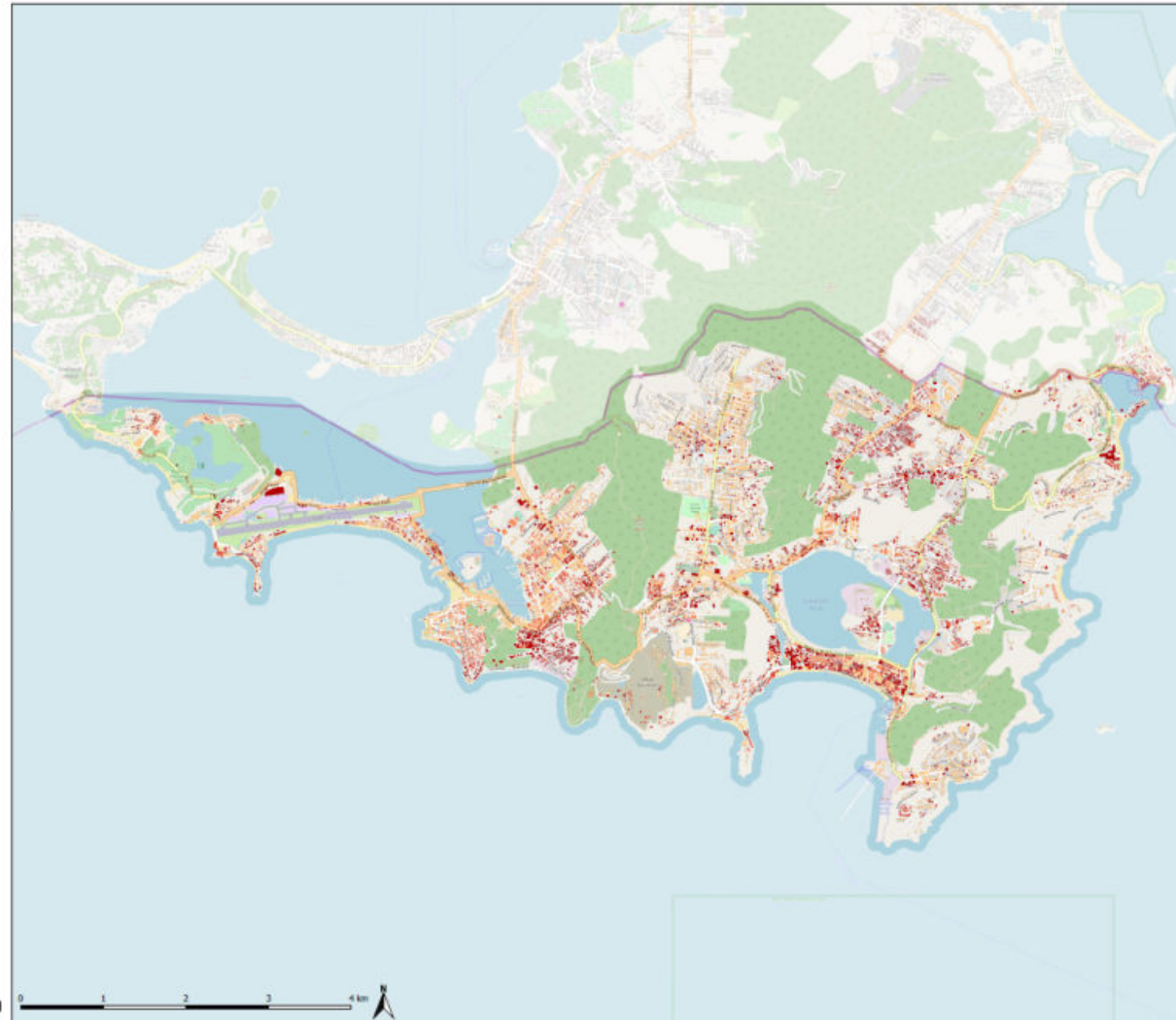
Building Damage

- Completely Destroyed
- Highly Damaged
- Moderately Damaged
- Headlines to slight damage
- Not Affected

	Buildings	Percentage
Completely Destroyed	1,000	1%
Highly Damaged	1,800	2%
Moderately Damaged	2,100	3%
Headlines to slight damage	11,100	10%
Total	11,900	100%
Total Affected	11,400	95%

Estimated Population affected: 19438*

510  AN INITIATIVE OF
THE NETHERLANDS
RED CROSS
Red Cross  St. Maarten



Damage Percentage per Sub-Area* of St. Maarten

Date : 12 September 2017

*Boundaries on this map do not reflect any administrative division within St. Maarten. Boundaries are defined by 510 based on natural breaks, to support the prioritisation of areas.

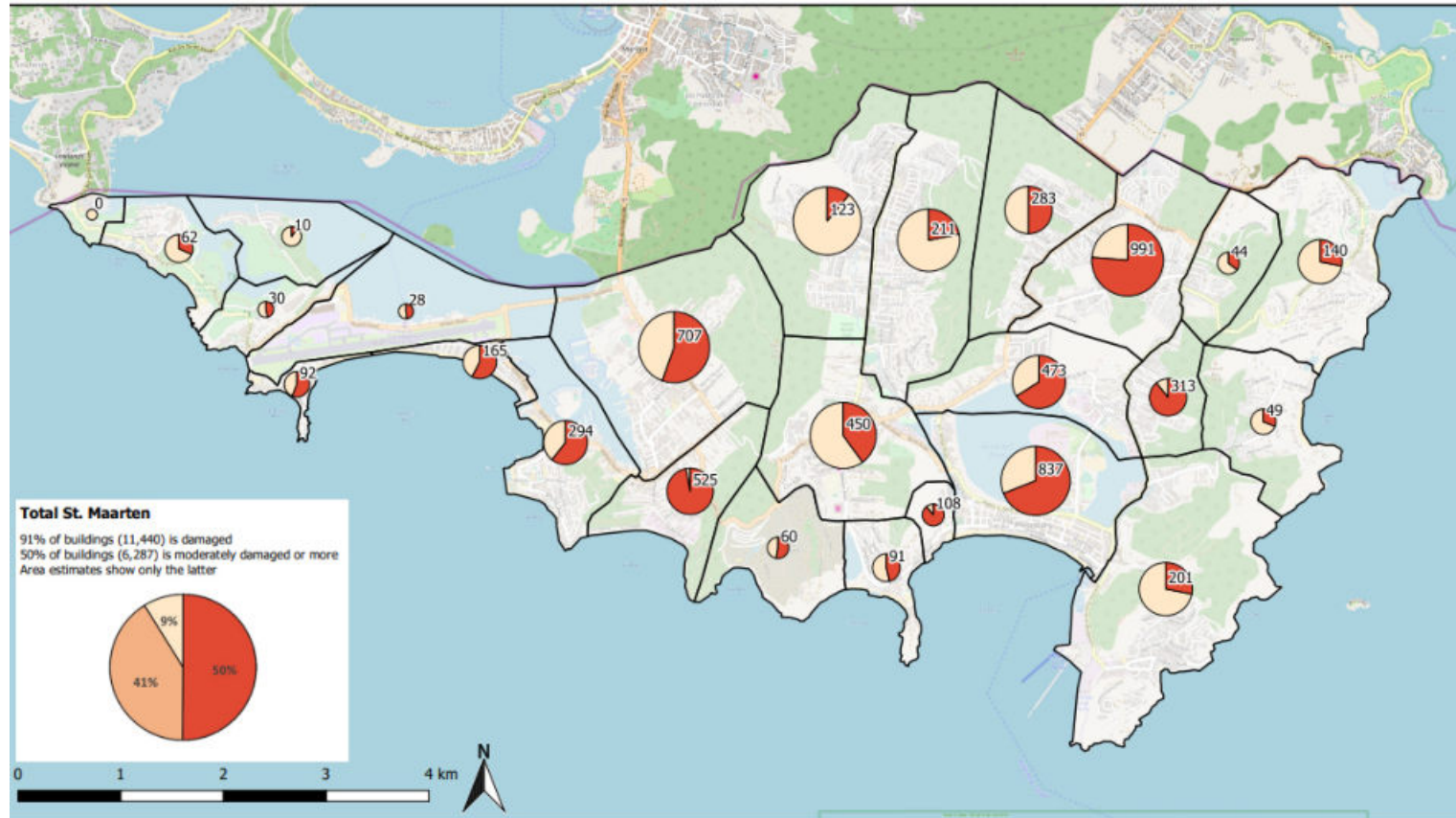
The maps used do not imply the expression of any opinion on the part of the International Federation of Red Cross and Red Crescent Societies or National Societies concerning the legal status of a territory or of its authorities.

Produced by 510 An initiative from the Netherlands Red Cross, St. Maarten Red Cross.

Sources: OpenStreetMap, Copernicus Emergency Management Service

Legend

- 123 # Moderate/High/Complete Damaged
- % Moderate/High/Complete Damaged
- % Not/Slightly Damaged
- Size represents Total # of Buildings



2016 Hurricane Irma

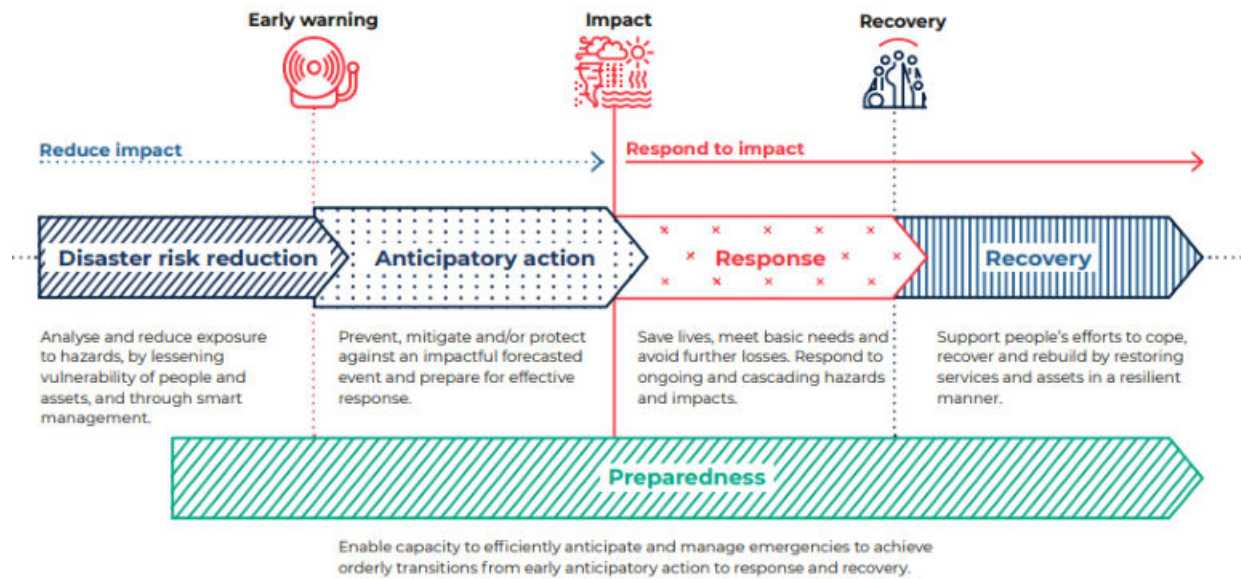
Damage per sub-area

Using satellite & drone imagery



An initiative of the Netherlands Red Cross

510 is leveraging the power of space-based technology in all disaster cycles



Source: Anticipation Hub (IFRC, German Red Cross, Red Cross Red Crescent Climate Centre)



510



An initiative of
the Netherlands
Red Cross

Anticipatory Action



Thematic coordinators: Marc van den Homberg



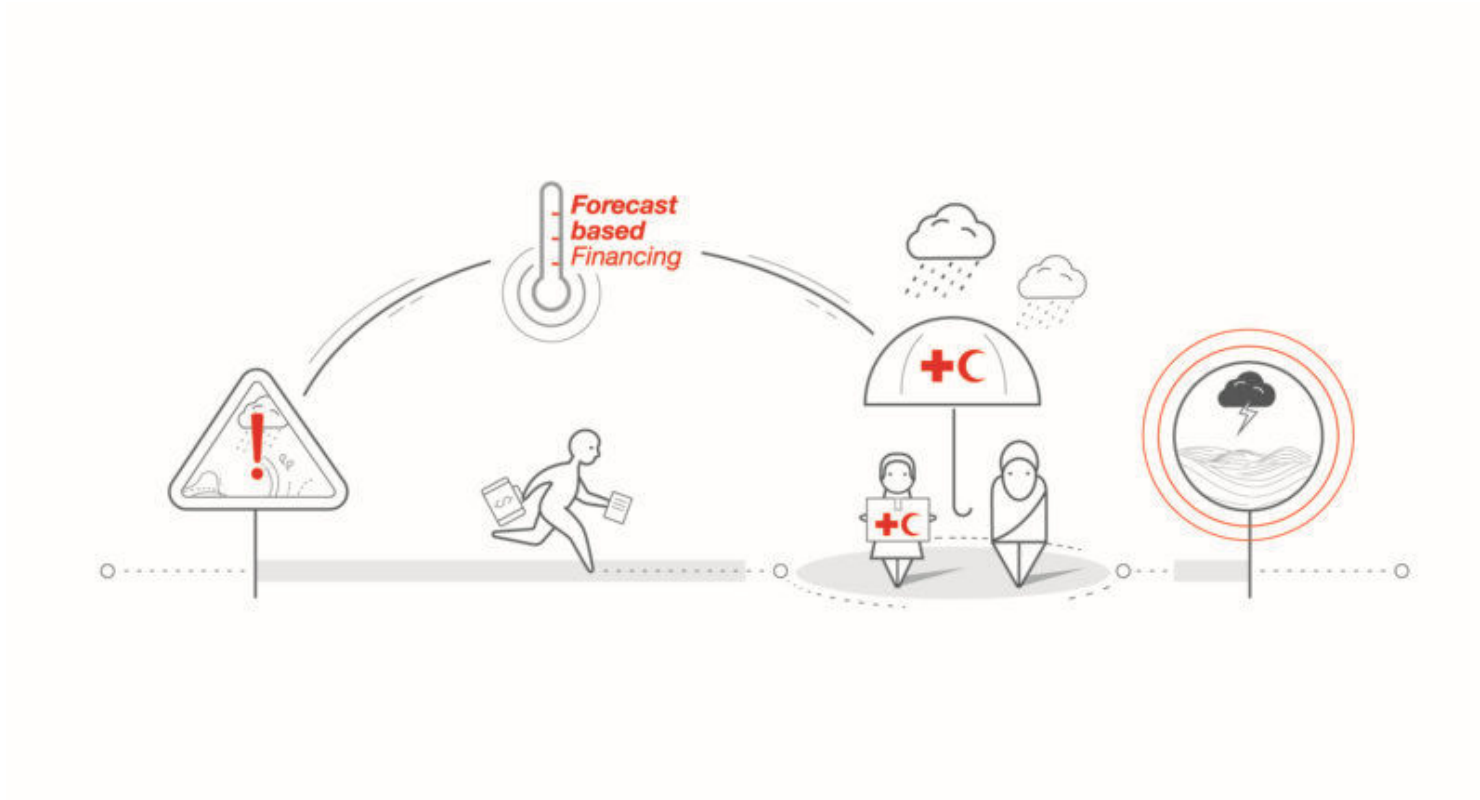
Aklilu Teklesadik



1\$ invested in mitigation
saves 6 to **13**\$ in recovery

Source: Natural Hazard Mitigation Saves: 2019 Report

Anticipatory Action



Anticipatory Action

Anticipatory Action means taking steps to protect people before a disaster strikes based on early warning or forecasts. To be effective, it must involve meaningful engagement with at-risk communities. 510 works on Anticipatory Action through **Impact Based Forecasting** and **Understanding the Risk**

Understanding the Risk

- Community Risk Assessment



Impact Based Forecasting

- Risk and Impact Analysis
- Trigger Model
- Early Action Protocol
- IBF Portal



Thematic coordinators: Marc van den Homberg 

Aklilu Teklesadik 

Understanding the Risk

Which communities are the most vulnerable? What are the main risk areas and how is the risk changing over time? These are not questions to be answered when a disaster strikes. Preparedness program managers need this information so that preparedness activities can be implemented in targeted areas. Organizations implementing anticipatory actions need an understanding of where the most vulnerable areas are. Emergency responders can better target intervention and aid response towards supporting the most vulnerable if there is risk assessment information available. 510 supports these stakeholders with Digital Risk Assessment tools.



Products/Services

510



An initiative of
the Netherlands
Red Cross

Community Risk Assessment