




Food and Agriculture  
Organization of the  
United Nations

# INCREASING CLIMATE RESILIENCE

Addressing the impact of extreme events on  
agriculture and the way forward





Over the last decades there has been a rising trend in the occurrence of disasters worldwide and related economic impact. This is particularly notable for climate related disasters - such as droughts, floods and storms - which are of significant concern to agriculture given the sector's dependence on climate. The FAO study on The Impact of Disasters on Agriculture and Food Security highlighted that, between 2003 and 2013, one quarter of the total economic impact of climate-related disasters in developing countries was absorbed by agriculture, with the share rising to 84 percent when only drought is considered. The rising trend in weather and climate-related disasters, also driven by climate change, is likely to exacerbate impacts on food security and rural livelihoods in developing countries, unless relevant climate change adaptation (CCA) and disaster risk reduction and management (DRR/M) measures are taken to better understand disaster impacts and enhance resilience.

As part of its strategic objective on increasing the resilience of livelihoods to threats and crises, FAO works with member countries to enhance and harmonize the assessment of damage and losses from disasters in crops, livestock, fisheries, aquaculture and forestry, as well as the monitoring and evaluation of DRR/M and CCA good practice technologies in agriculture. Advancements and improvements in the field of damage and losses monitoring are crucial to support global and regional initiatives on climate change adaptation in agriculture.

For more information:

[www.fao.org/emergencies/how-we-work/resilience](http://www.fao.org/emergencies/how-we-work/resilience)

[www.a2rinitiative.org](http://www.a2rinitiative.org)

# Climate-related disaster trends

Average climate-related disasters

1980-1990

**149**/year

to

2004-2014

**332**/year

Average economic damage of climate-related disasters\*

increased from

1980-1990

USD **14B**/year

to

2004-2014

USD **100B**/year

In the last seven years on average

**22.5**  
million  
people

were displaced from  
their homes each year by  
**climate-related  
disasters**  
mostly floods and storms

=

**62 000**  
people  
every day

# The impact of disasters between 2005 and 2015

**1.8**  
billion  
people

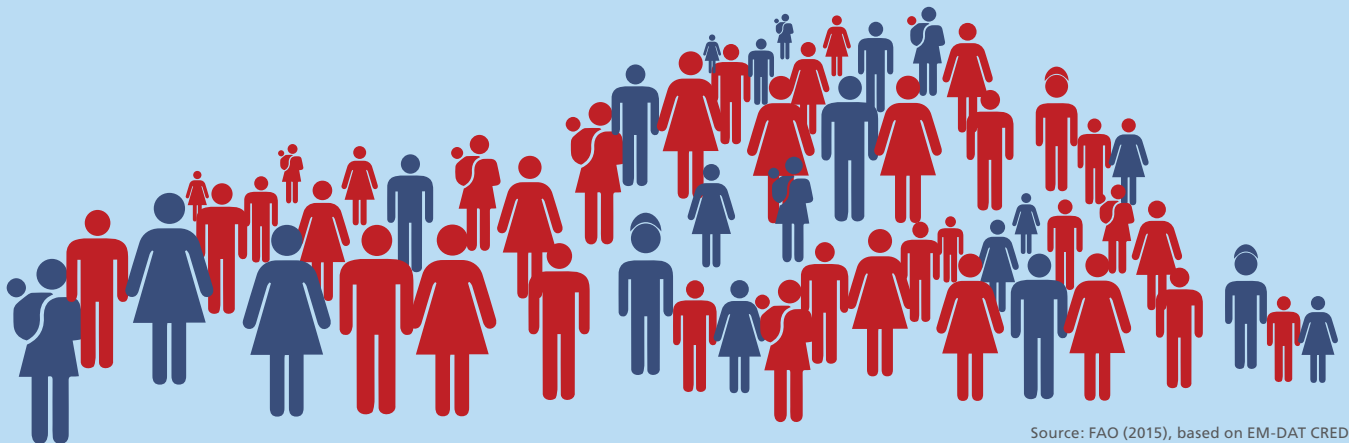
were affected by  
**natural disasters**  
over the past decade in  
**developing**  
**countries**

**94%**

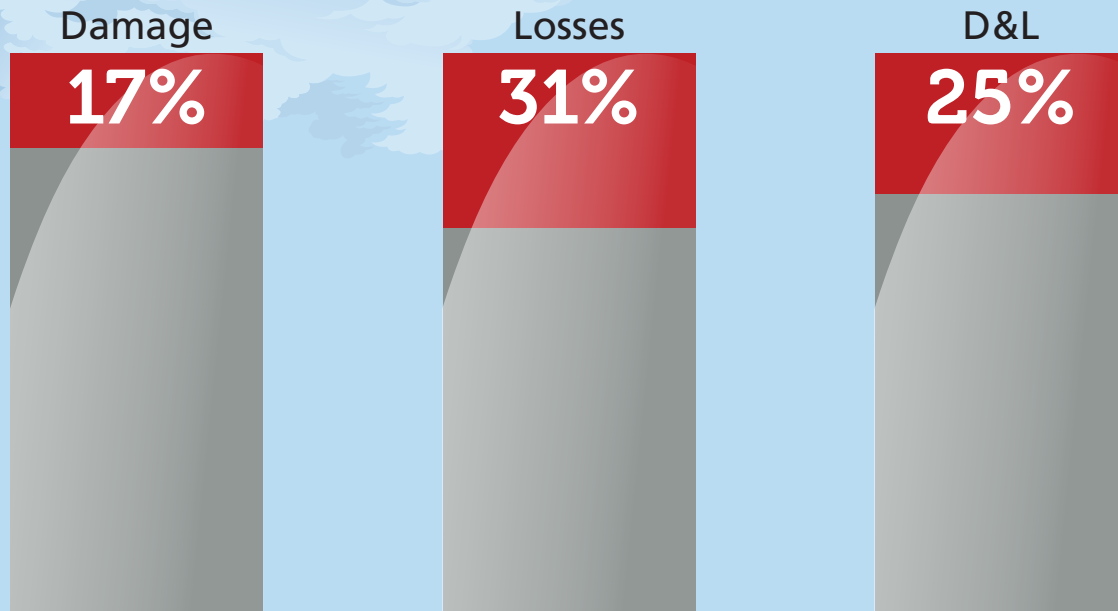
were affected by  
**climate-related**  
**disasters**

**64%**  
of all damage

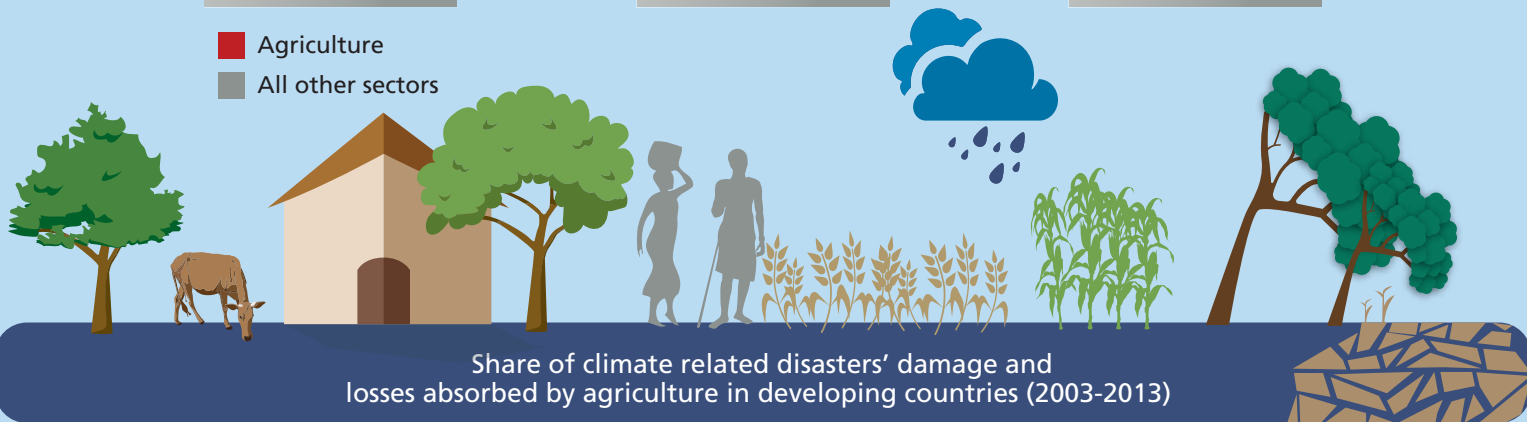
due to natural disasters were  
**climate-related**



# Damage and losses from climate-related disasters in agriculture



■ Agriculture  
■ All other sectors



Share of climate related disasters' damage and losses absorbed by agriculture in developing countries (2003-2013)

# Natural disasters causing greatest damage and losses to agriculture 2003-2013

Of these natural disasters,  
9 are climate-related disasters



**\$824 M**  
Colombia floods  
2010-2011

**\$1.3 B**  
Thailand floods  
2011

**\$1.9 B**  
Pakistan floods  
2011

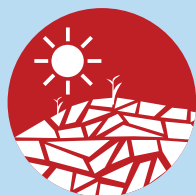
**\$5.3 B**  
Pakistan floods  
2010



**\$845 M**  
Philippines cyclone  
Ondoy and Pepeng  
2009

**\$1 B**  
Yemen TS038  
2008

**\$1.4 B**  
Philippines  
Typhoon Haiyan  
2013



**\$863 M**  
Uganda drought  
2008-2011

**\$10.5 B**  
Kenya drought  
2008-2011

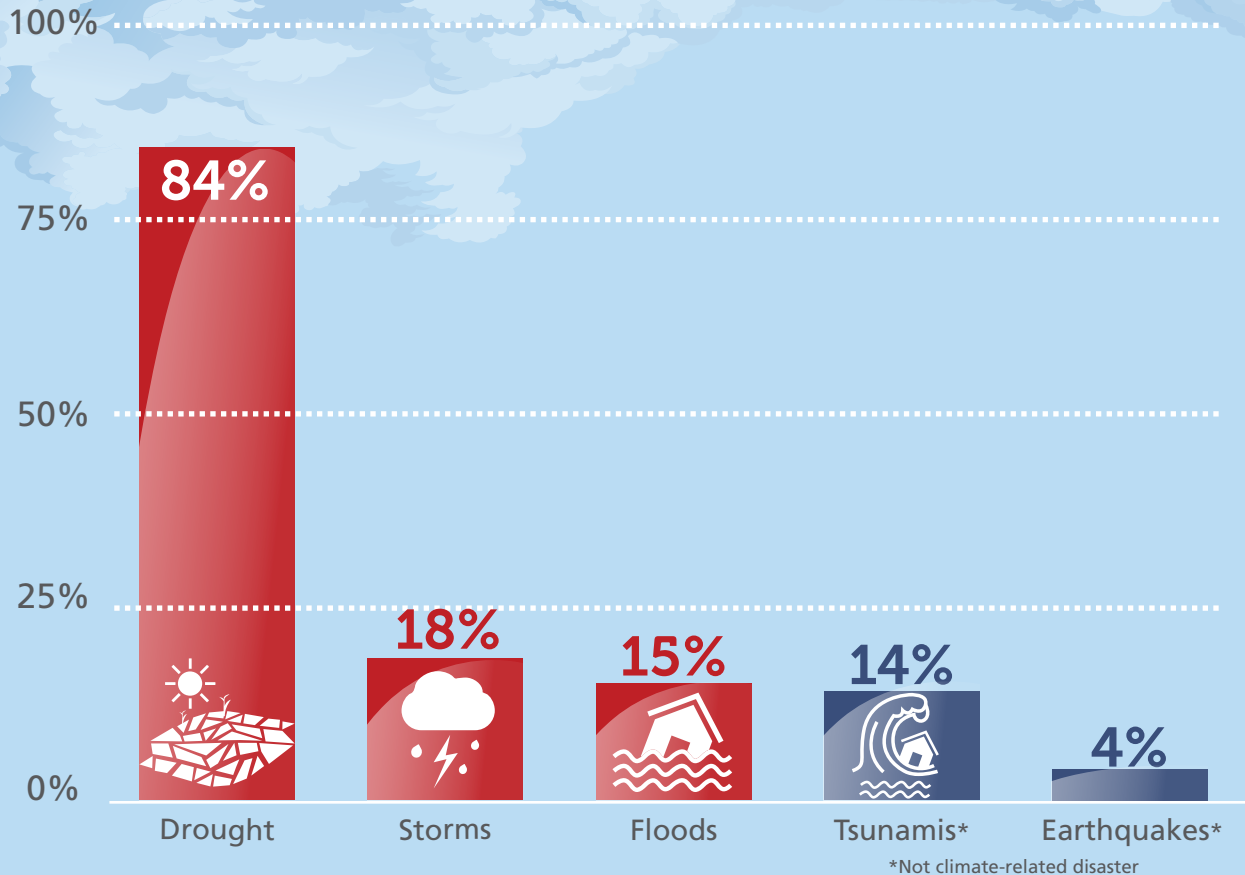


**\$860 M**  
Indonesia Tsunami  
2004

\*Not climate-related disaster

# Damage and losses by type of hazard

Share of climate related disasters' damage and losses absorbed by agriculture in developing countries (2003-2013)

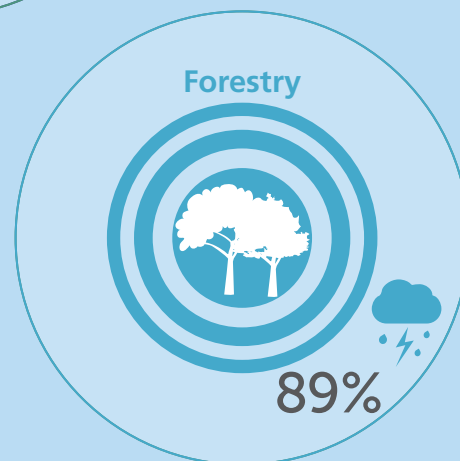
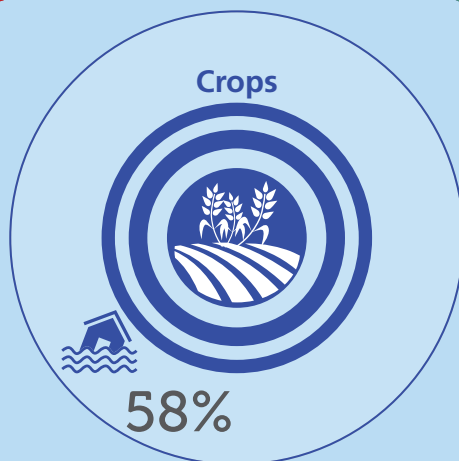
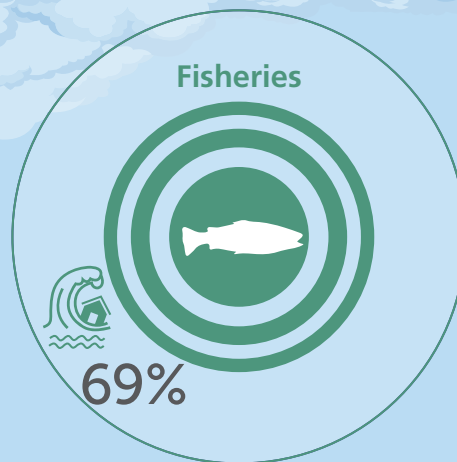
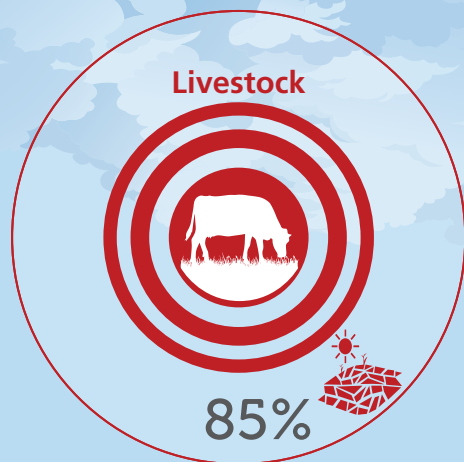


**Agriculture absorbed 84% of total damage and losses** caused by drought in developing countries (2003-2013)

Agriculture sectors need to be prioritized in order to enhance the **resilience of livelihoods** to drought impacts

# Damage and losses by agricultural subsector and type of hazard

Share of total damage and losses in each subsector (2003-2013)



**Agriculture subsectors are affected differently by disasters**

Crops and livestock are the most affected by climate-related disasters i.e. drought, floods, storms

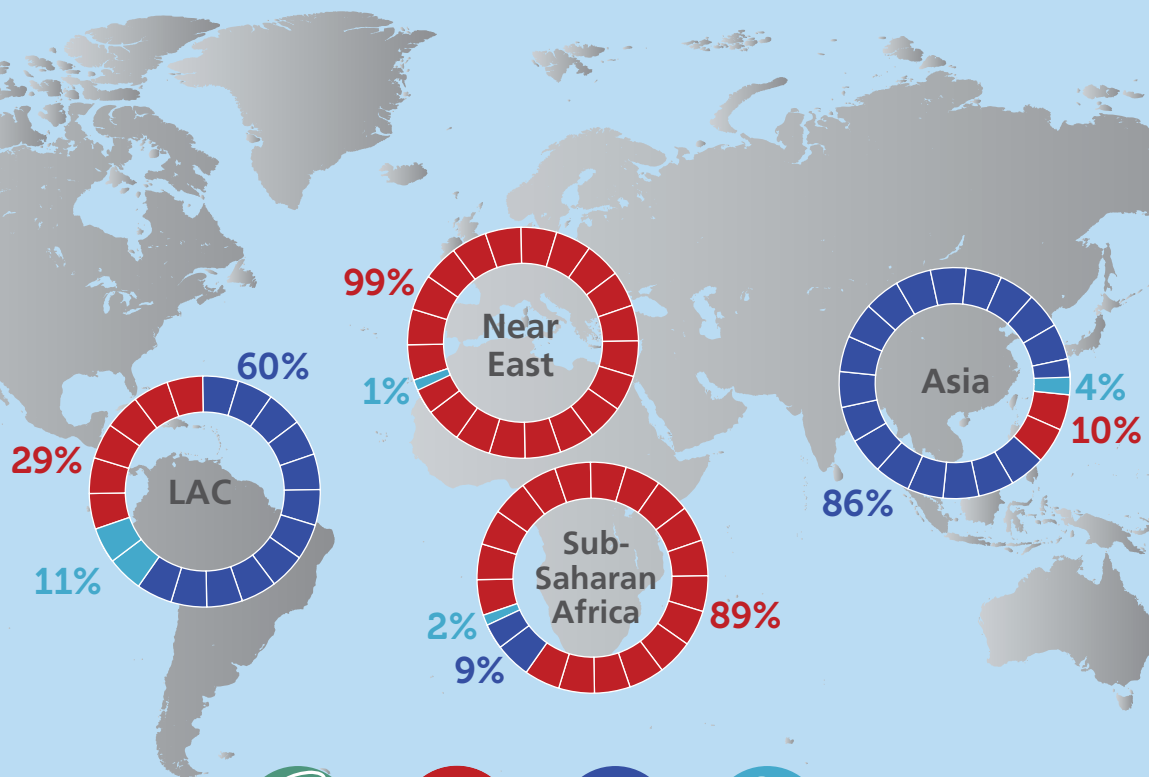
# The impact of large-scale climate-related disasters on crop and livestock production varies by region

Between 2003-2013:

Sub-Saharan Africa and the Near East were mainly affected by **drought**

Asia was mainly affected by **floods**.

Latin America and Caribbean countries were affected mostly by **floods**, and to a lesser extent by **drought** and **storms**.



Tsunamis



Drought



Flood

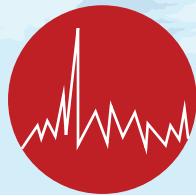


Storm

# Climate change exacerbates spread and impact of food chain threats



**70%**  
of poor depend  
on livestock

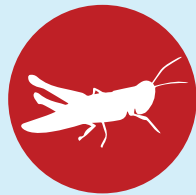


over  
**70%**  
of emerging diseases  
in humans originate  
in animals



estimated annual economic losses from  
transboundary animal diseases

USD **1.45 billion**  
to **2.1 billion**



locust plagues  
can destroy up to  
**100%**  
of crops



Plant diseases can cause up to  
**80%**  
yield losses

# Climate change worsens protracted crises and conflict



**500 M**

people are potentially affected  
by protracted crises



hunger rates in protracted  
crisis situations are almost  
**3 times higher**  
than in other developing contexts



**40%**

more protracted crises  
today than in 1990



Protracted crises absorb  
**80%**  
of humanitarian funds

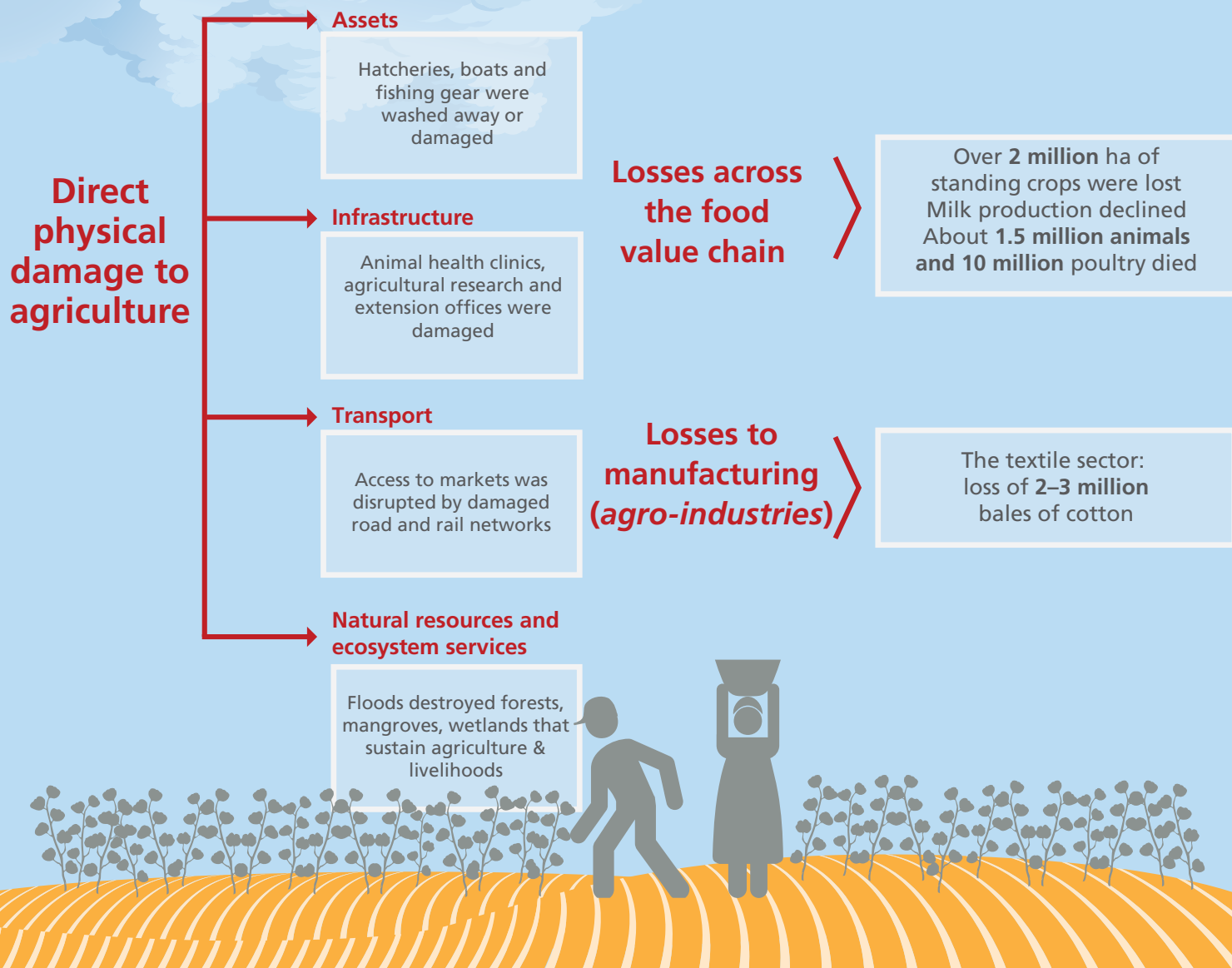


**87%**

of people affected by conflict  
do not flee their homes

# The cascading effect of disasters on agriculture, food security, and value chains:

## Case study from 2010 Pakistan floods



## Macro-economic impact

The agriculture sector growth fell to **0.2%** in 2010 from **3.5%** in 2009

## Impact on agricultural livelihoods, food security and nutrition

Over **60%** of households lost much of their food grain stocks

Food inflation surged to **20%** by September 2010 from **12%** in July

Over **70%** of farmers lost more than **50%** of their expected income. The poorest were the most affected

Almost one-third of the population had poor consumption intake and **19%** were borderline

**4.5 million** workers were affected; two-thirds were employed in agriculture

## The effect on sustainable development

Hinder the achievement of Sustainable Development Goals, especially **SDG 1**: "End poverty in all its forms everywhere"; **SDG 2**: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture"; and **SDG 13**: "Take urgent actions to combat climate change and its impacts".



# FAO's work on measuring and addressing disaster damage & losses

## FAO information system on damage and losses from disasters in agriculture

FAO is working with



member countries



experts



relevant stakeholders

on establishing  
an information system on  
**damage & losses**  
in



crops



livestock



fisheries &  
aquaculture



forestry

Systematic information on disaster impact would provide policy-makers and stakeholders with consistent and standardized data and metadata for evidence-based decision-making on Disaster Risk Reduction and Management (DRR/M), as well as more informed disaster response and recovery efforts.

## Methodology for measuring the return on investment into DRR/M Good Practice Technologies in Agriculture

**FAO provides technical support** to member countries for the monitoring and evaluation of DRR/M good practice technologies in agriculture.

**Goal:** Enhance understanding of how much damage and losses can be avoided through the implementation of DRR technologies for agriculture at local level, and identify leverage points and potential barriers to upscaling.

# FAO's Resilience Programme



**FAO believes** that countries, communities and individuals, together with development and humanitarian actors, can build livelihoods that are resilient to climate-induced disasters.

Adopting a multihazard and cross-sectoral approach and increasing the climate resilience of agricultural livelihoods to threats and crises require action across these four mutually reinforcing areas.

FAO climate resilience efforts contribute to the UN Secretary General collective outcome "the climate resilience initiative (A2R)", under SDG 13, target 1.1.

