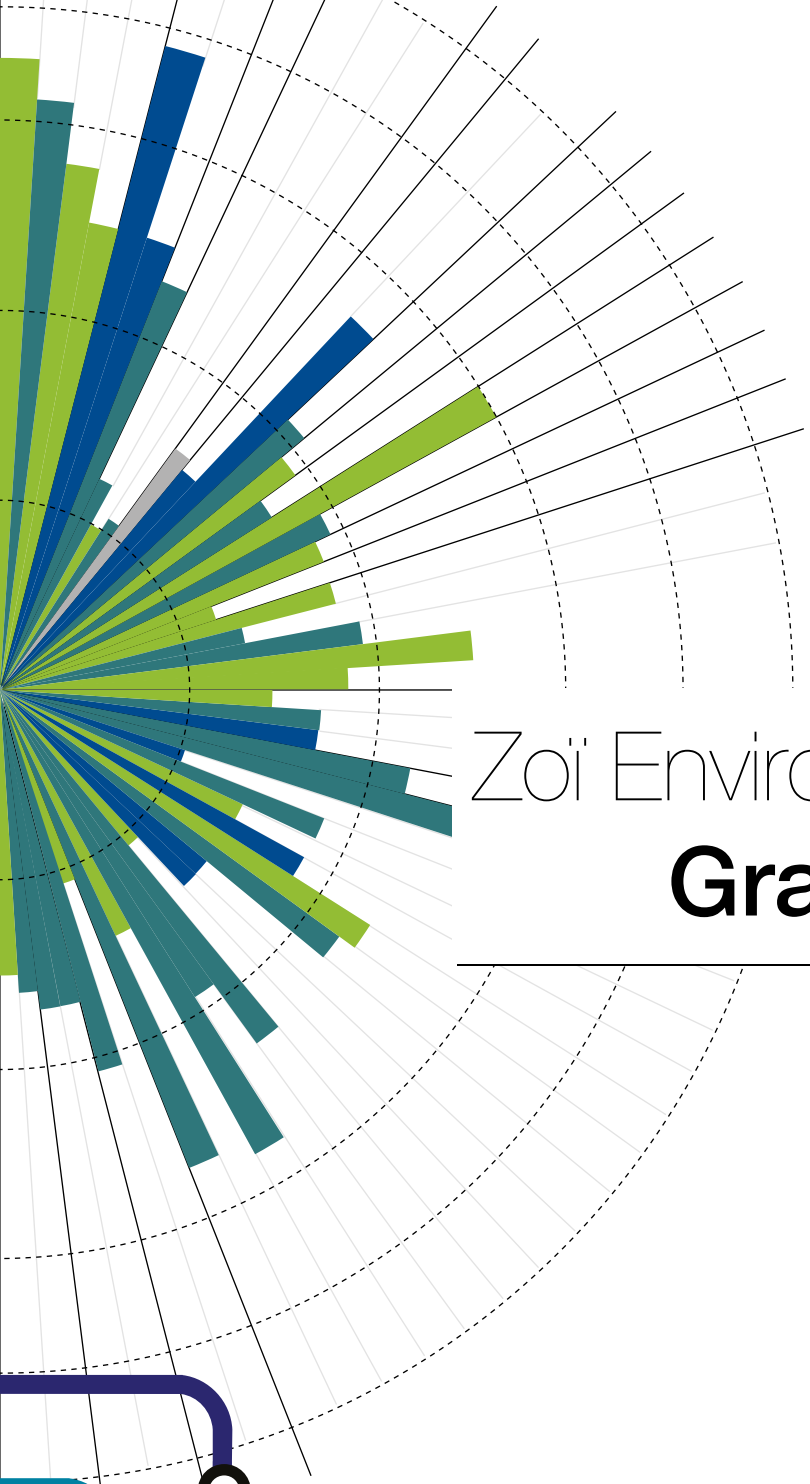
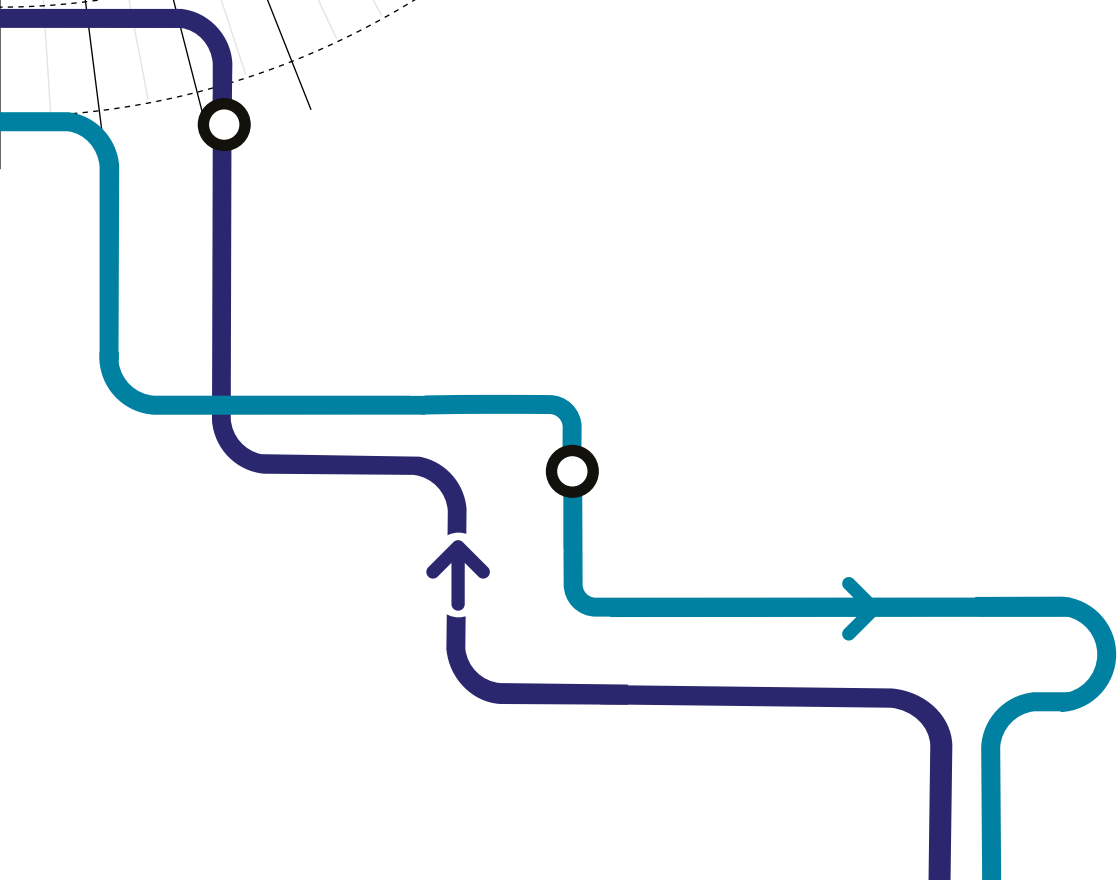


Zoï Environment Network

Graphic Portfolio

2021



zoï
environment network

Rivers of Central Asia

Glaciers and water sources

Glacial source / source
Town or city
Major city
Lake
Reservoir

River mainly fed by glacial and snow melt
River mainly fed by snow and rain
Canal
Collector
Inland river delta

Climate change impacts on glaciers and water

Glacial lake outburst flood risk, changes in rock and slope stability
Water deficit risk

Major river systems

Amu Darya
Syr Darya
Tarim
Ili
Chu
Talas

Climate-Cryosphere-Water Nexus
Central Asia Outlook
Blue Peace Central Asia, 2018

Central Asia

Water resource formation and use

Average water withdrawal (km^3/year)

Average flow (km^3/year)

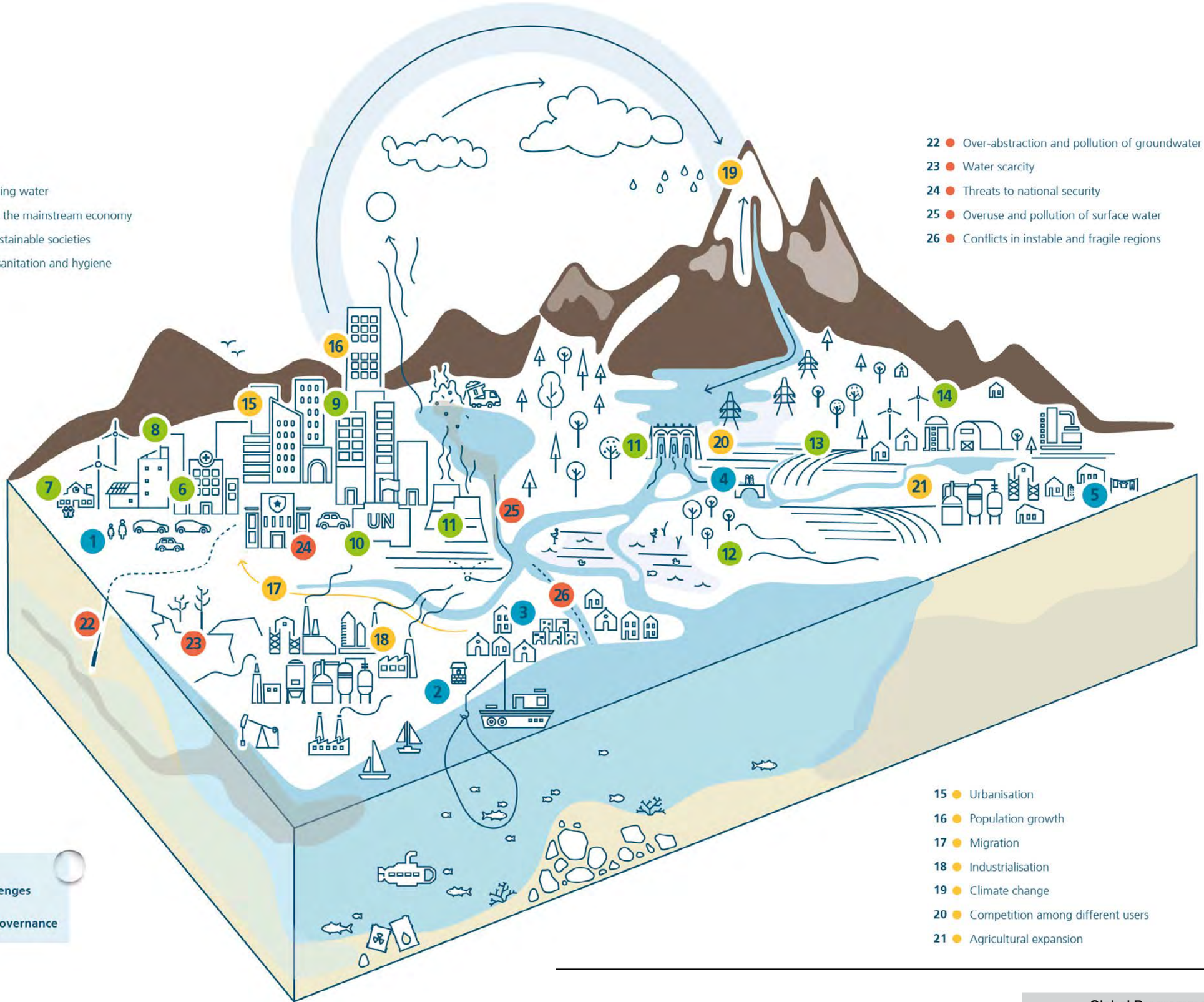
70
30
10
5

- Mountain regions above 2000 metres
- Irrigated lands
- Drainage water and irrigation run-off
- Re-use of drainage
- Main glacier areas
- River basin outline
- Country boundary

Source: water flow and water use data www.cawater-info.net

Climate-Cryosphere-Water Nexus
Central Asia Outlook
Blue Peace Central Asia, 2018

Water is life



1 Empowered women and youth
2 Access to safe and affordable drinking water
3 Connecting marginalised people to the mainstream economy
4 Peaceful, inclusive, cohesive and sustainable societies
5 Access to adequate and equitable sanitation and hygiene

6 Public health
7 Education
8 Sustainable development
9 Economic growth
10 Global governance
11 Producing energy
12 Integrity of ecosystems
13 Growing food
14 Sustaining rural livelihoods

22 Over-abstraction and pollution of groundwater
23 Water scarcity
24 Threats to national security
25 Overuse and pollution of surface water
26 Conflicts in instable and fragile regions

15 Urbanisation
16 Population growth
17 Migration
18 Industrialisation
19 Climate change
20 Competition among different users
21 Agricultural expansion

Benefits of water cooperation
Links with other key global challenges
Pressures on water resources
Negative impacts of bad water governance

Global Programme Water – Programme Framework 2021-24
SDC, 2021

New « Silk road »

- Central Asia expanded
- Secondary state involved
- China
- Russia
- European Union
- Eurasian hub in China

Railroad

- existing
- planned or under construction

Pipelines connecting China

- Main pipelines (oil and gas)
- Planned

Economic corridors

- Eurasiatic road
- South and Southeast Asia
- Maritime road

North maritime road

- Permanent
- Only in the summer

Ports with Chinese engagement

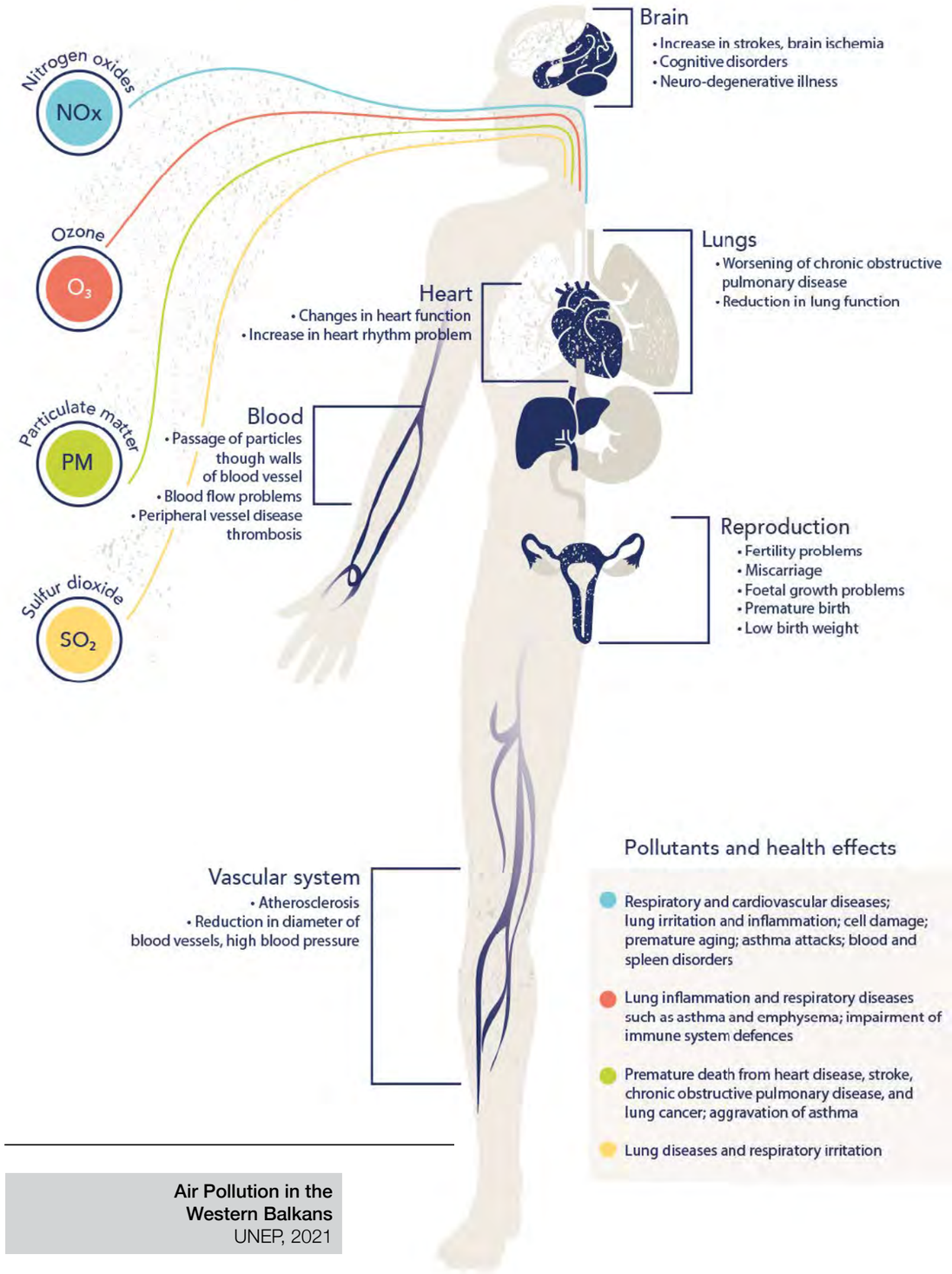
- existing
- planned or under construction

Sources: Mercator Institute for China Studies, May 2017; Courrierinternational.com; Scmp.com ; Energy Information Administration (EIA).

Map produced by Agnès Stienne
Zoi Environment Network, March 2018.

Greening the Belt and Road Projects in Central Asia
SDC, 2019

Impact on human health



Pollutants and health effects

- Respiratory and cardiovascular diseases; lung irritation and inflammation; cell damage; premature aging; asthma attacks; blood and spleen disorders
- Lung inflammation and respiratory diseases such as asthma and emphysema; impairment of immune system defences
- Premature death from heart disease, stroke, chronic obstructive pulmonary disease, and lung cancer; aggravation of asthma
- Lung diseases and respiratory irritation

Air Pollution in the Western Balkans
UNEP, 2021

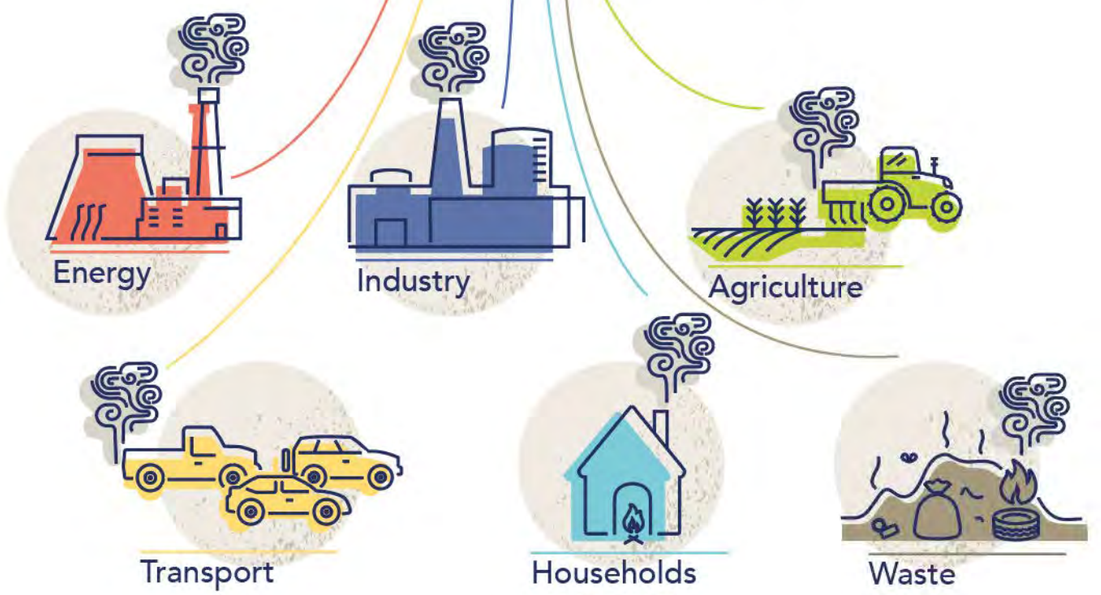
Pollutants and sources

7 million deaths
per year due to air pollution

5,000 per year
in the **Western Balkans**

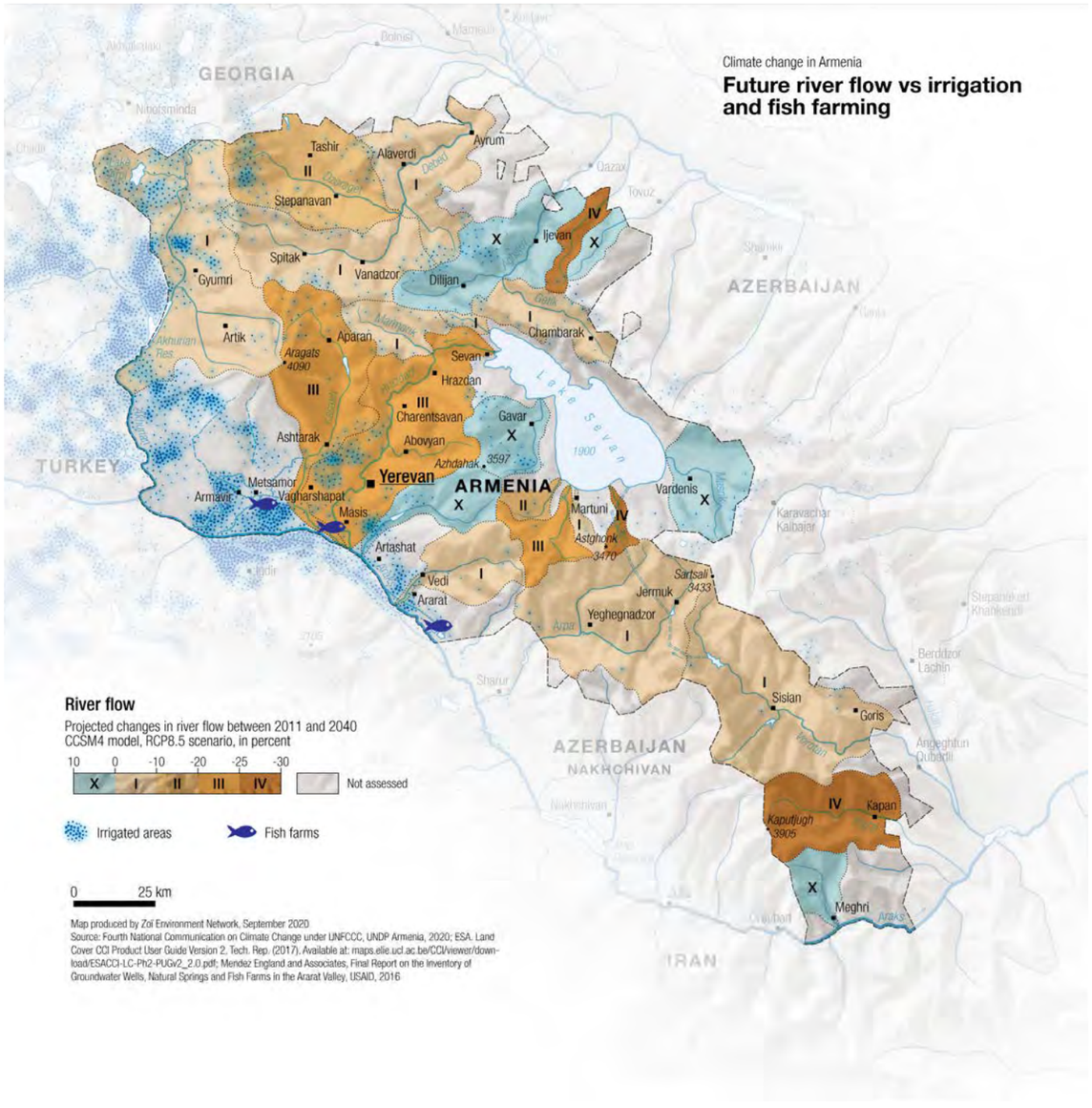
People in Western Balkans
lose up to **13–16 months**
of life to air pollution

- NOx — Power generation and transport
- O_3 — Forms when nitrogen oxides and volatile organic compounds react in stagnant air and sunlight
- PM — Directly from fires and smokestacks; and forms in the atmosphere through reactions among chemical pollutants emitted by power plants, industry or vehicles
- SO_2 — Power generation and transport



Climate change in Armenia

Future river flow vs irrigation and fish farming



River flow

Projected changes in river flow between 2011 and 2040
CCSM4 model, RCP8.5 scenario, in percent

10 0 -10 -20 -25 -30

X I II III IV

Not assessed

Irrigated areas

Fish farms

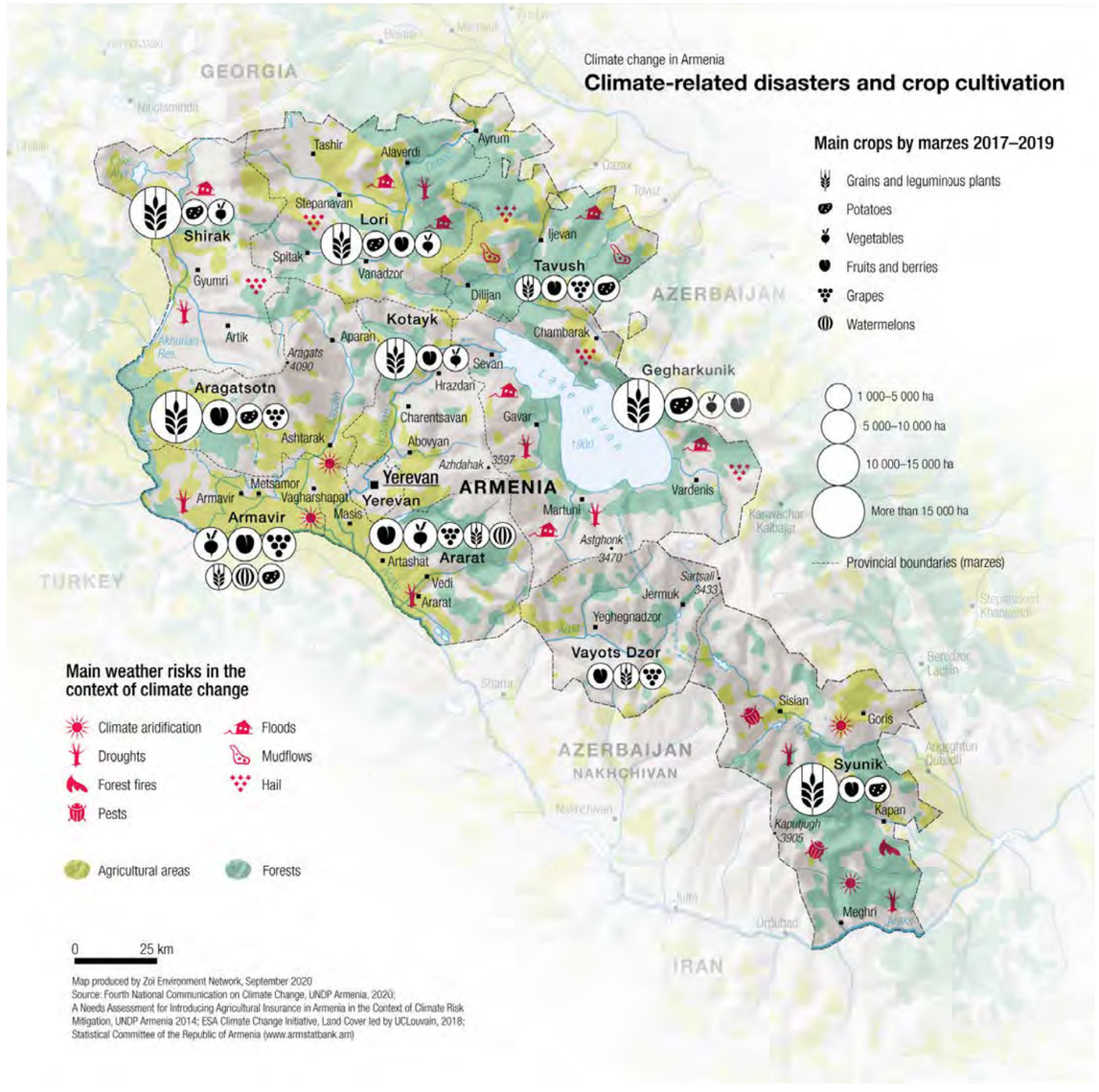
0 25 km

Map produced by Zoi Environment Network, September 2020
Source: Fourth National Communication on Climate Change under UNFCCC, UNDP Armenia, 2020; ESA. Land Cover CCI Product User Guide Version 2. Tech. Rep. (2017). Available at: maps.elie.ucl.ac.be/CCI/viewer/download/ESACCI-LC-PhZ-PUGv2_2.0.pdf; Mendez England and Associates, Final Report on the Inventory of Groundwater Wells, Natural Springs and Fish Farms in the Ararat Valley, USAID, 2016

National Framework for Climate Services for the Republic of Armenia
SDC, 2021

Climate change in Armenia

Climate-related disasters and crop cultivation



Main crops by marzes 2017–2019

- Grains and leguminous plants
- Potatoes
- Vegetables
- Fruits and berries
- Grapes
- Watermelons

1 000–5 000 ha
5 000–10 000 ha
10 000–15 000 ha
More than 15 000 ha

Provincial boundaries (marzes)

Main weather risks in the context of climate change

- Climate aridification
- Droughts
- Forest fires
- Pests
- Floods
- Mudflows
- Hail

Agricultural areas

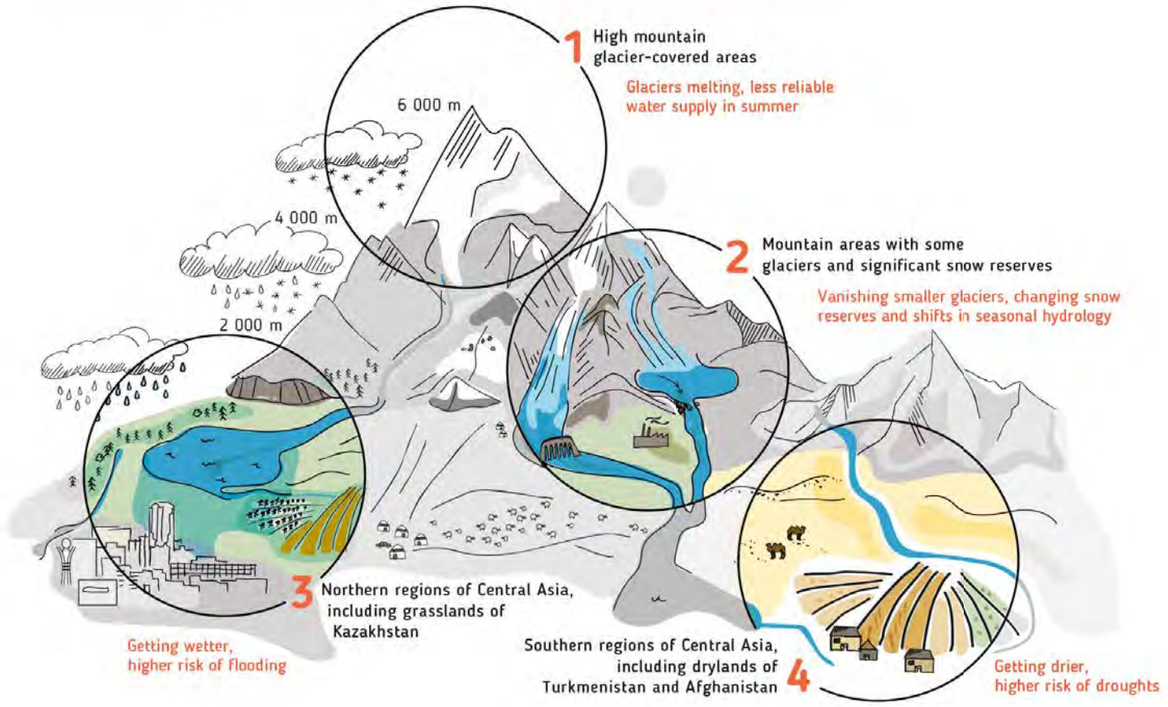
Forests

0 25 km

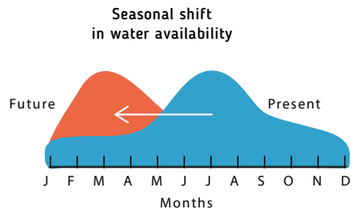
Map produced by Zoi Environment Network, September 2020
Source: Fourth National Communication on Climate Change, UNDP Armenia, 2020;
A Needs Assessment for Introducing Agricultural Insurance in Armenia in the Context of Climate Risk Mitigation, UNDP Armenia 2014; ESA Climate Change Initiative, Land Cover led by UCLouvain, 2018;
Statistical Committee of the Republic of Armenia (www.armstatbank.am)

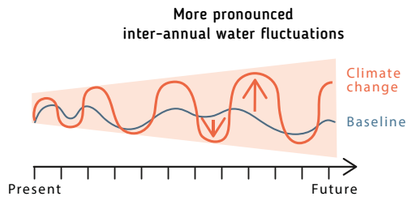
National Framework for Climate Services for the Republic of Armenia
SDC, 2021

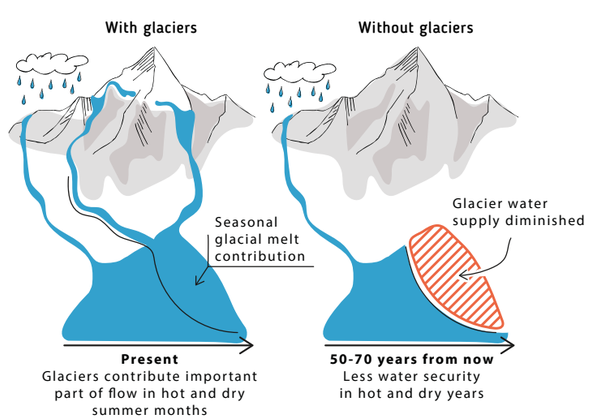
Climate change impacts on water resources in Central Asia

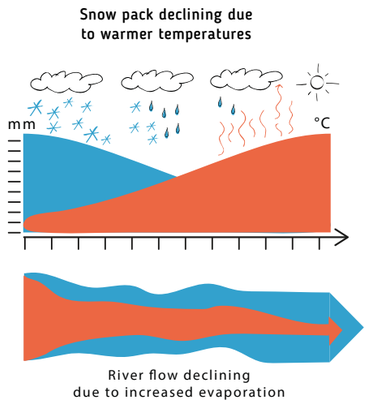


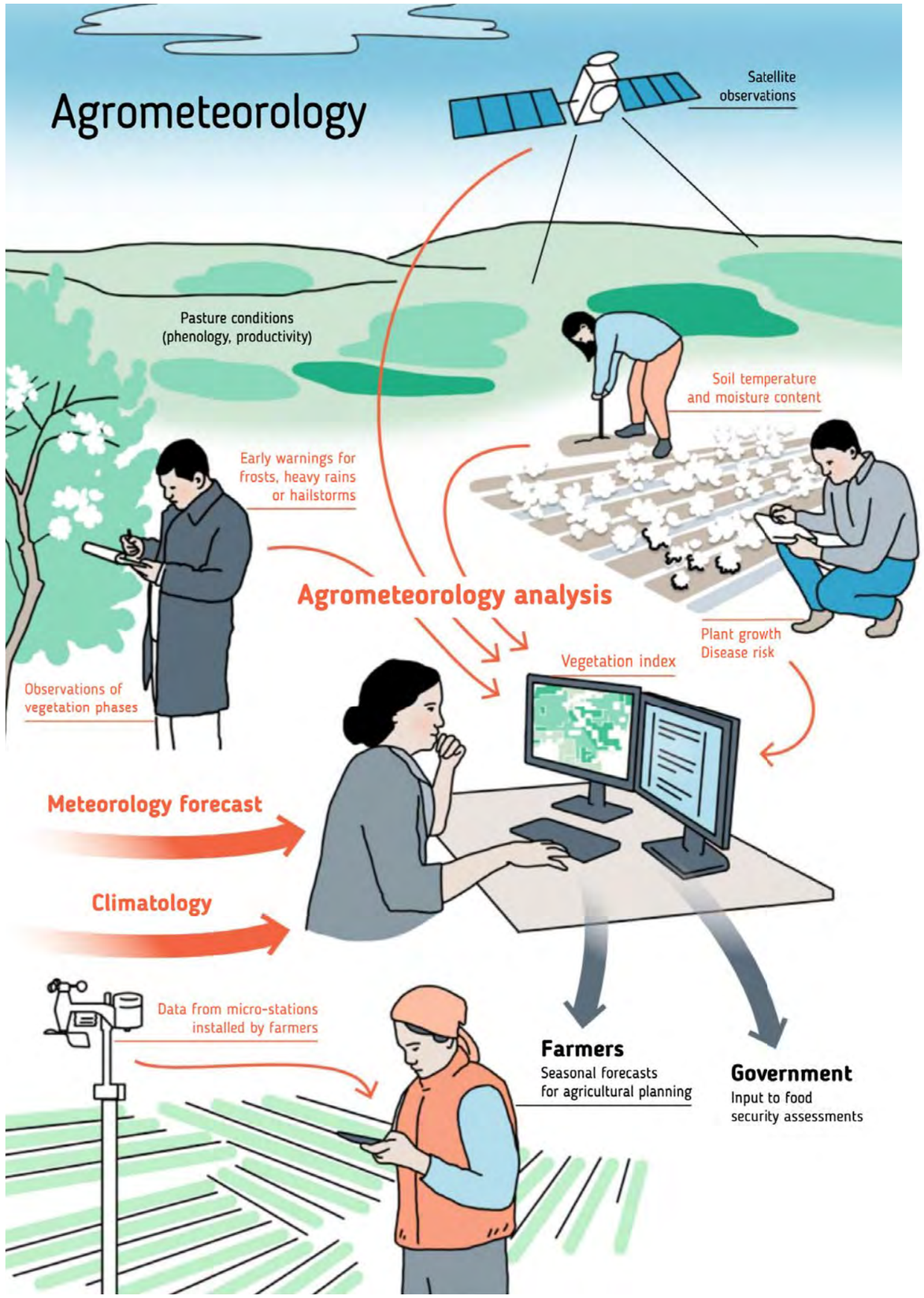
Weather, Climate and Water in Central Asia
World Bank Group, 2019











Climate Change Vulnerability & Mountain Areas

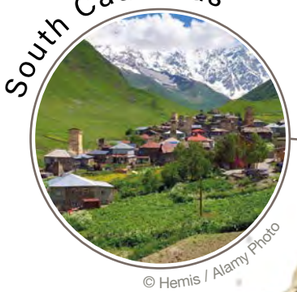
Climate change vulnerability

low · medium · high · extreme risk

Hindu Kush Himalaya

© Jitendra Raj Bajracharya / ICIMOD

South Caucasus



© Hemis / Alamy Photo

Andes

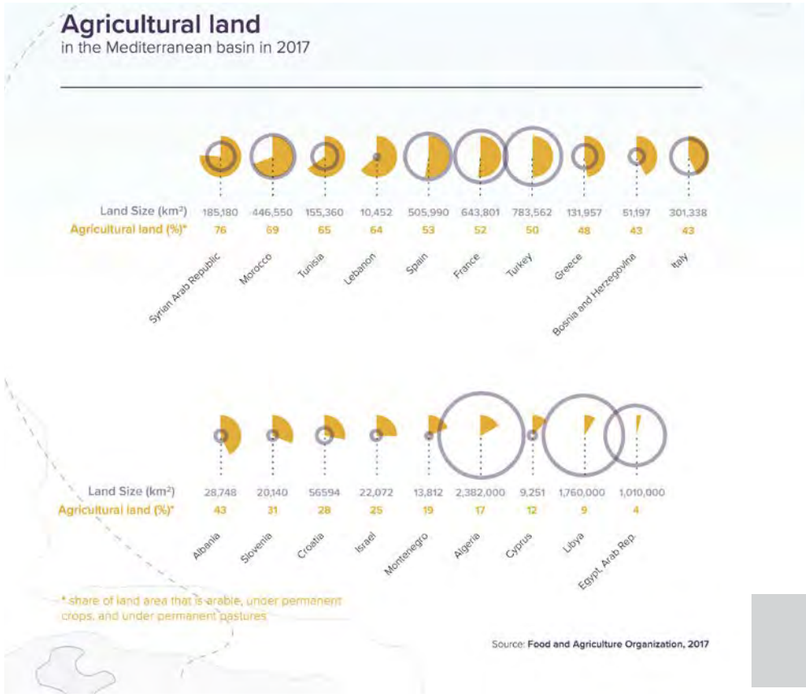
© Ute Grabowsky / phototnek.net

East Africa

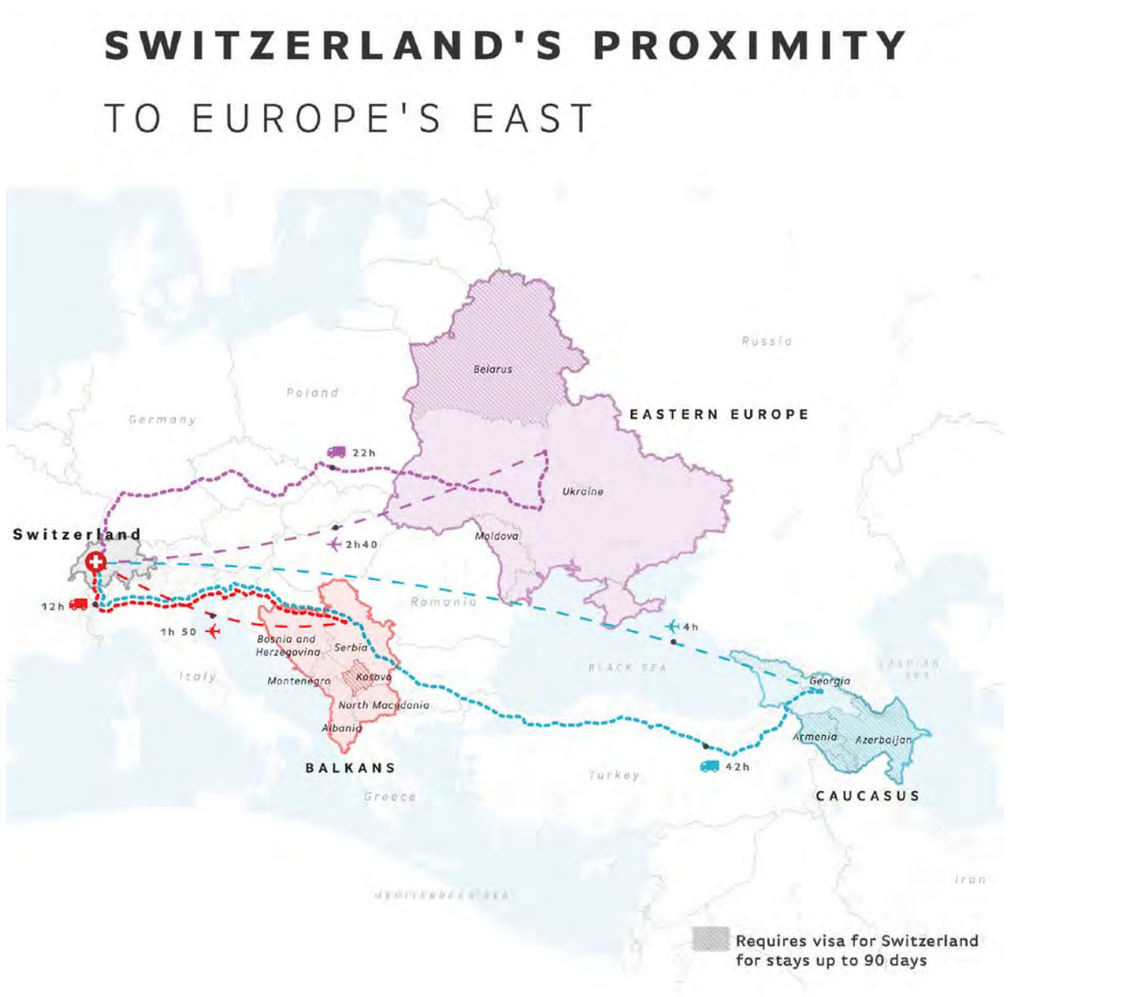
© Vivian Atakos / CCAFS

Sources: Verisk Maplecroft;
Climate Change Vulnerability Index 2017

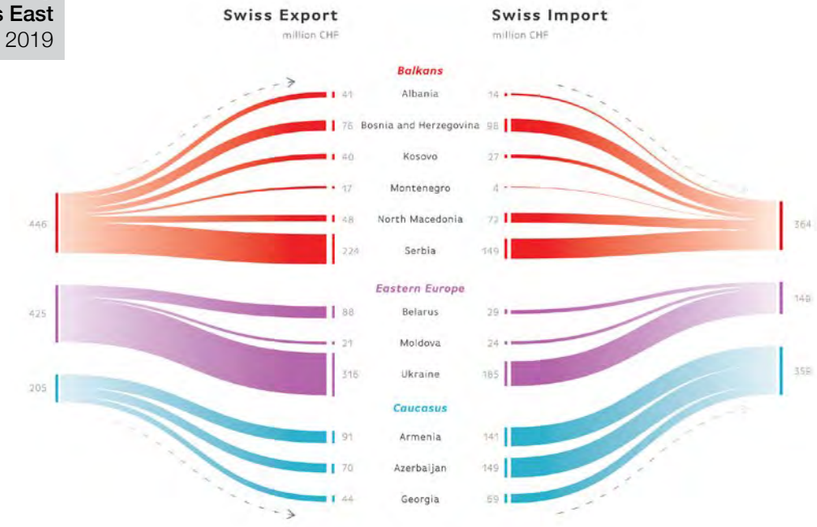
Adaptation at Altitude
Taking Action in the Mountains
SDC, 2020



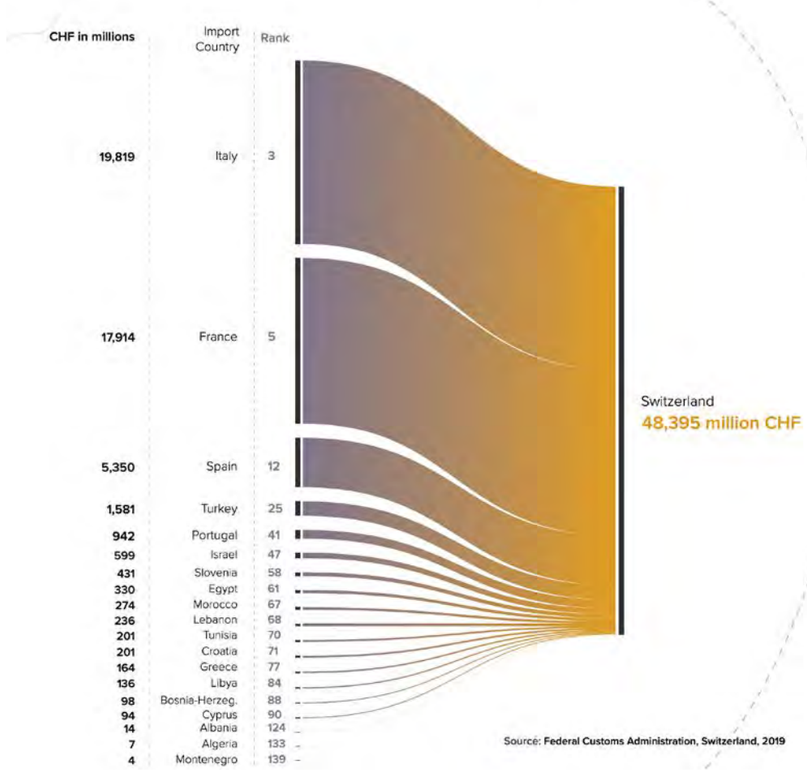
Climate Change & Security in the Mediterranean Basin
FDFA, 2019



Switzerland's Proximity to Europe's East
SDC, 2019

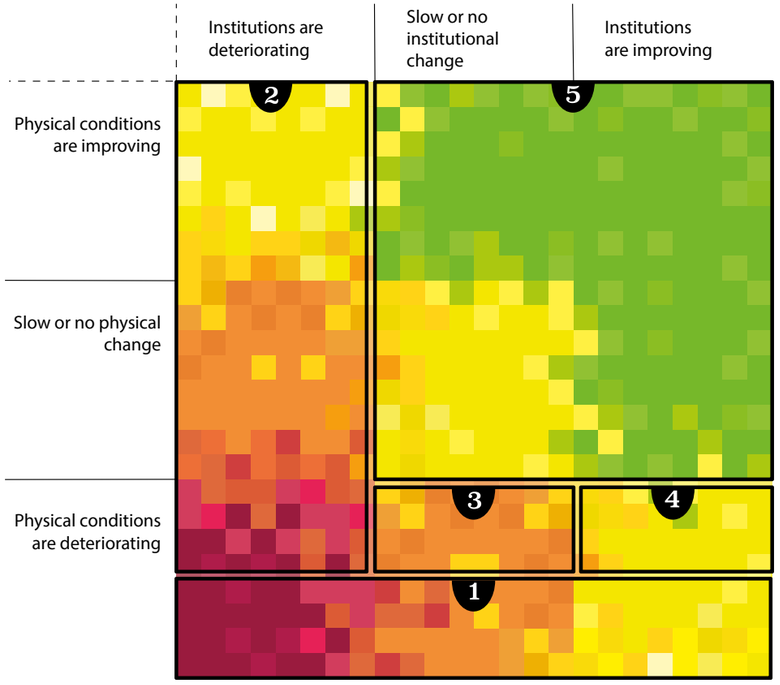


Swiss imports by trading partner in the region, 2017



Institutions

National or inter-state arrangements regulating access to, the use and management of waters shared between states, communities, sectors etc.



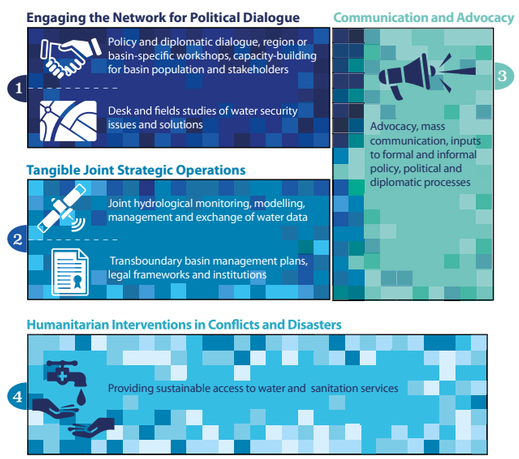
Physical conditions

Quantity or quality of available water resources, including changes in flow regulation patterns.

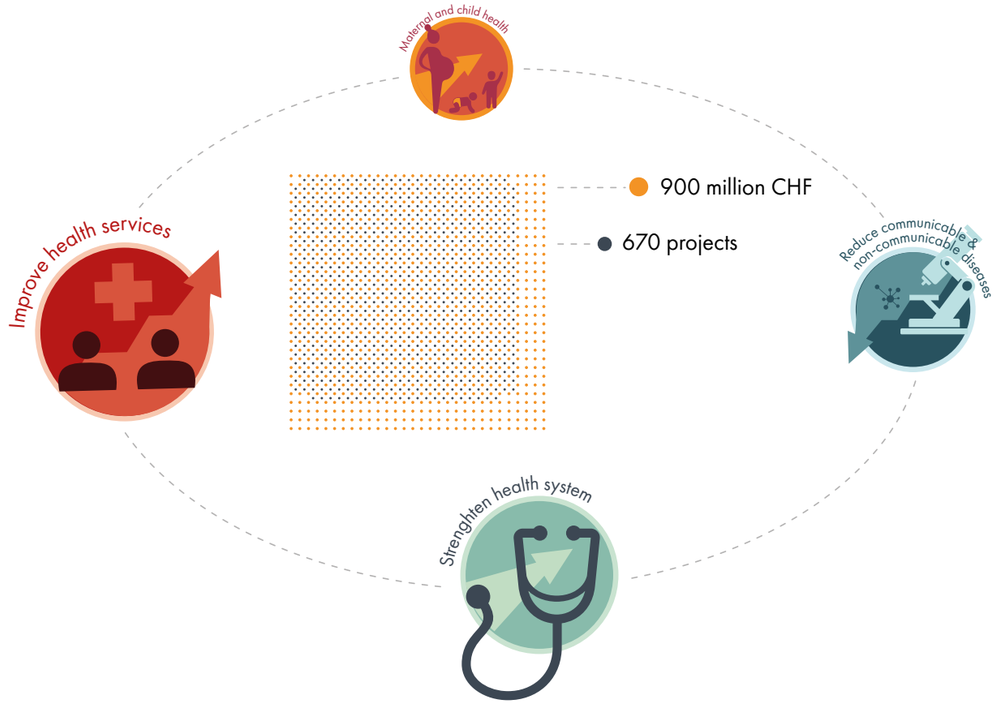
Likelihood / intensity of conflicts or tensions under water stress (local, intra-state / inter-sectoral, inter-state):

Actions

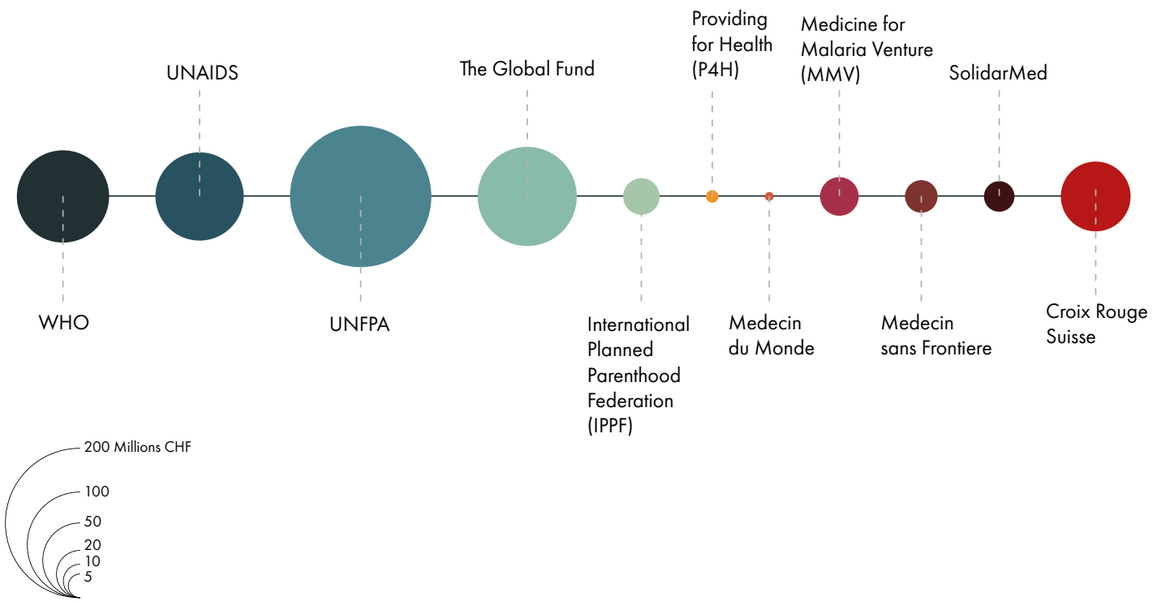
1. Contain the fast change in physical conditions
2. Replace / restore damaged or deteriorating institutions
3. Boost institutional adaptation
4. Direct inststitutional adaptation
5. Maintain status quo, encourage improving and sustain institutions

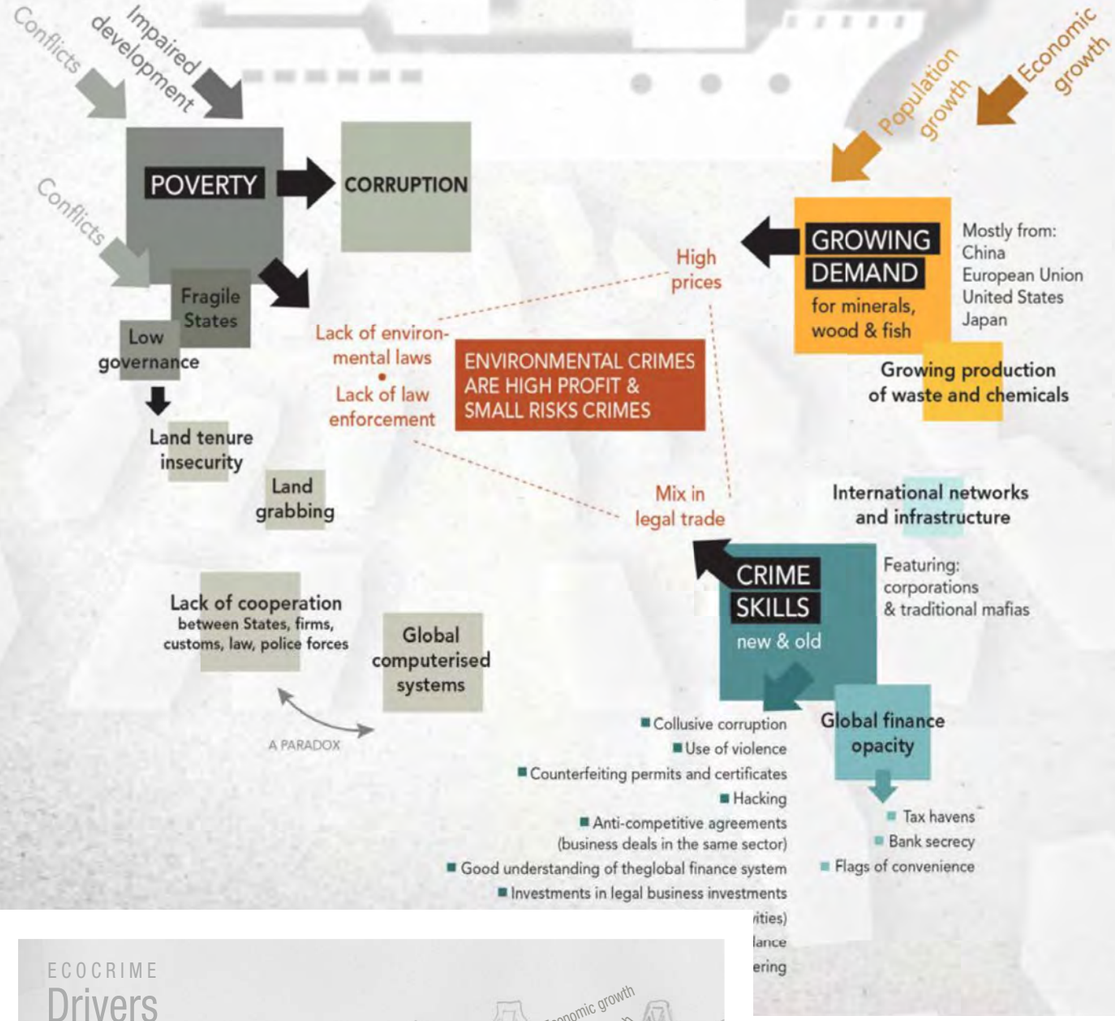


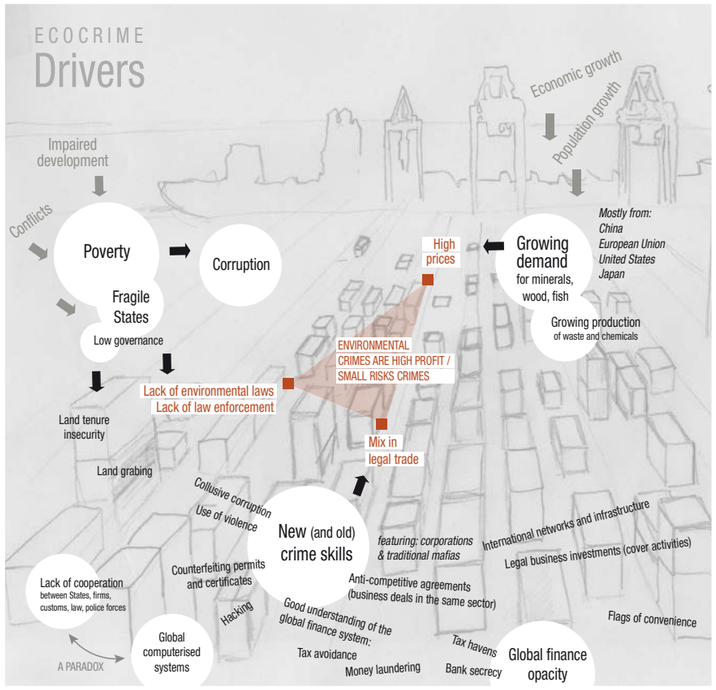
Water as an Asset for Peace Atlas of Risks and Opportunities
SDC, 2017



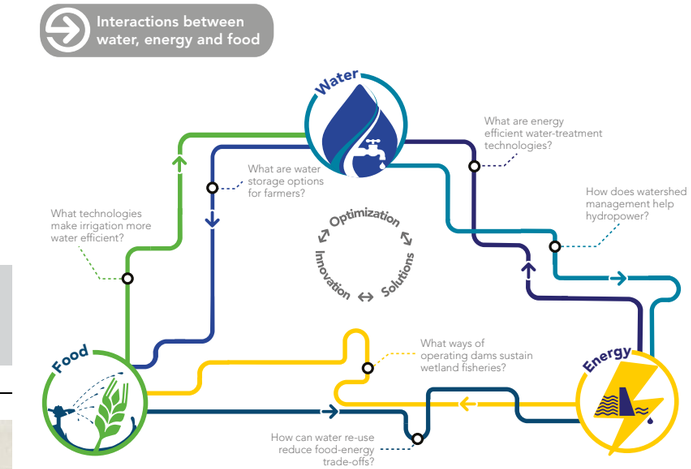
Effectiveness of Swiss International Cooperation on Health Interventions 2000-2013
SDC, 2015



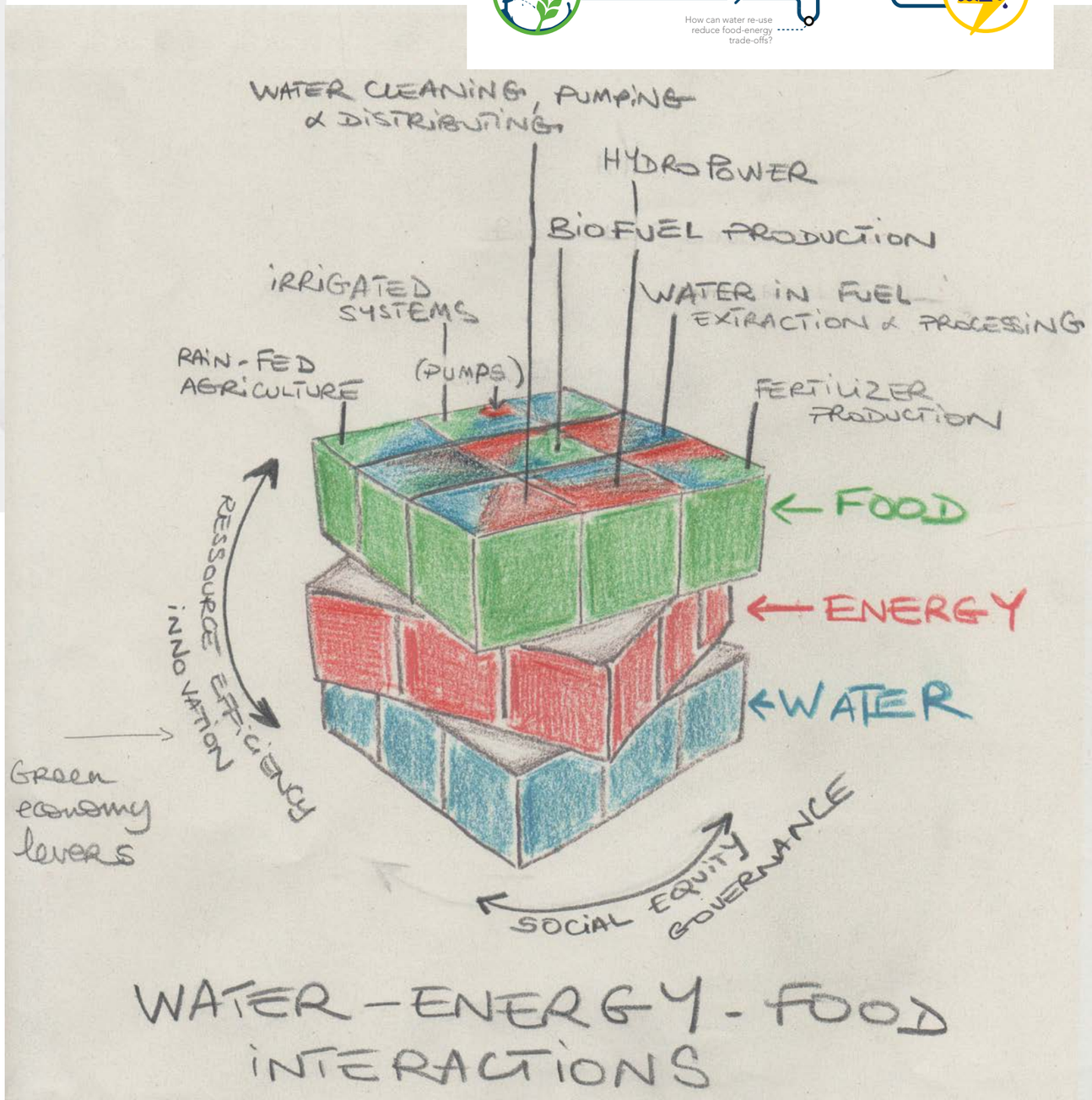




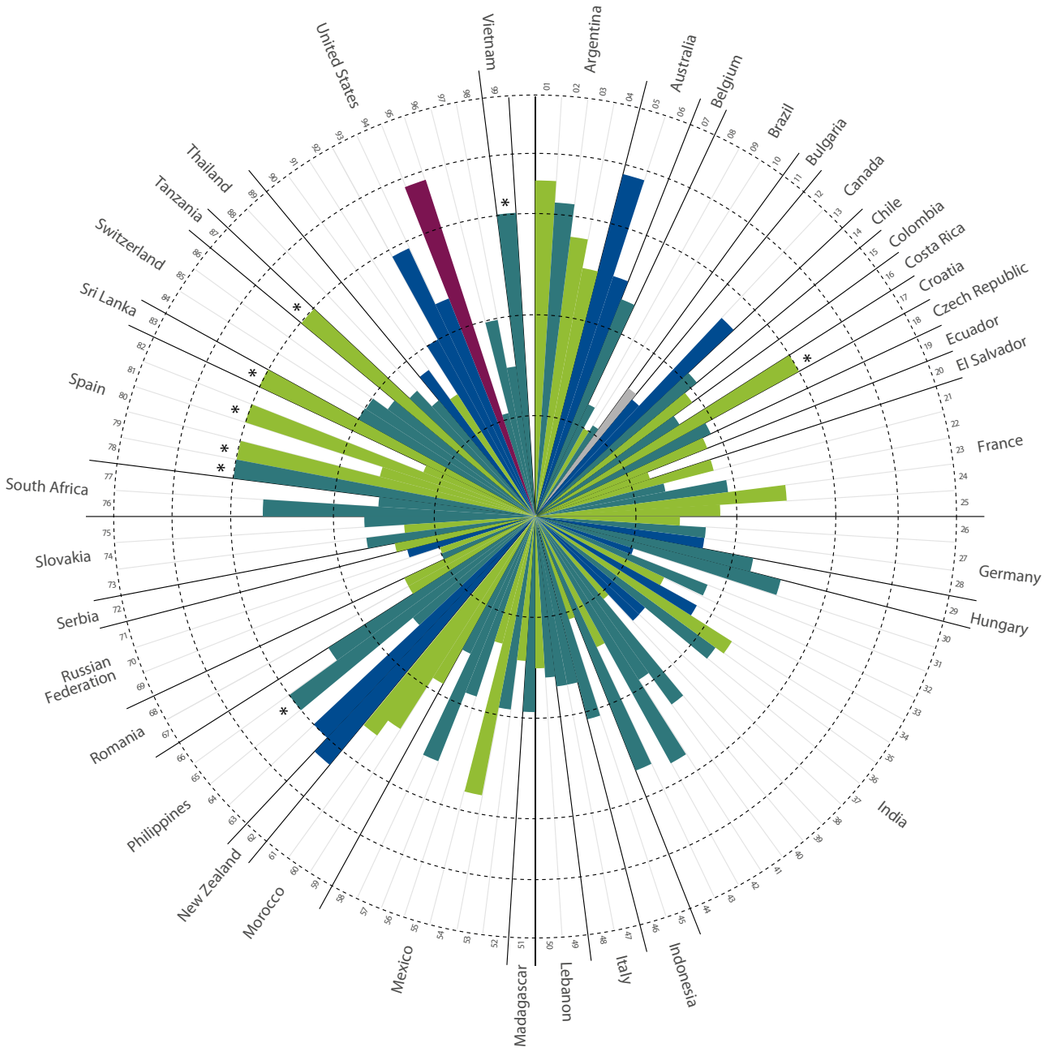
Environmental Crimes
Zoï Environment Network, 2013

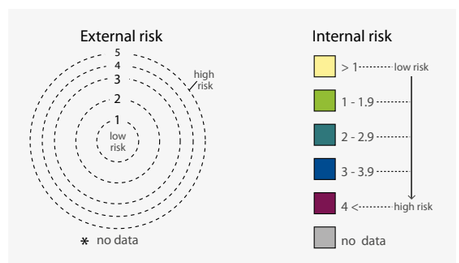


Water - Energy - Food NEXUS
IUCN Global Water Programme, 2013

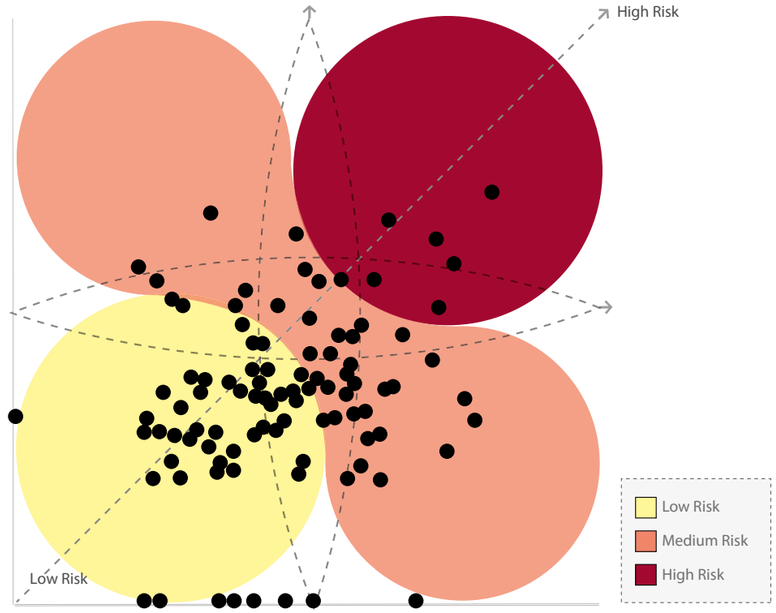


Company A - General Risk Assessment

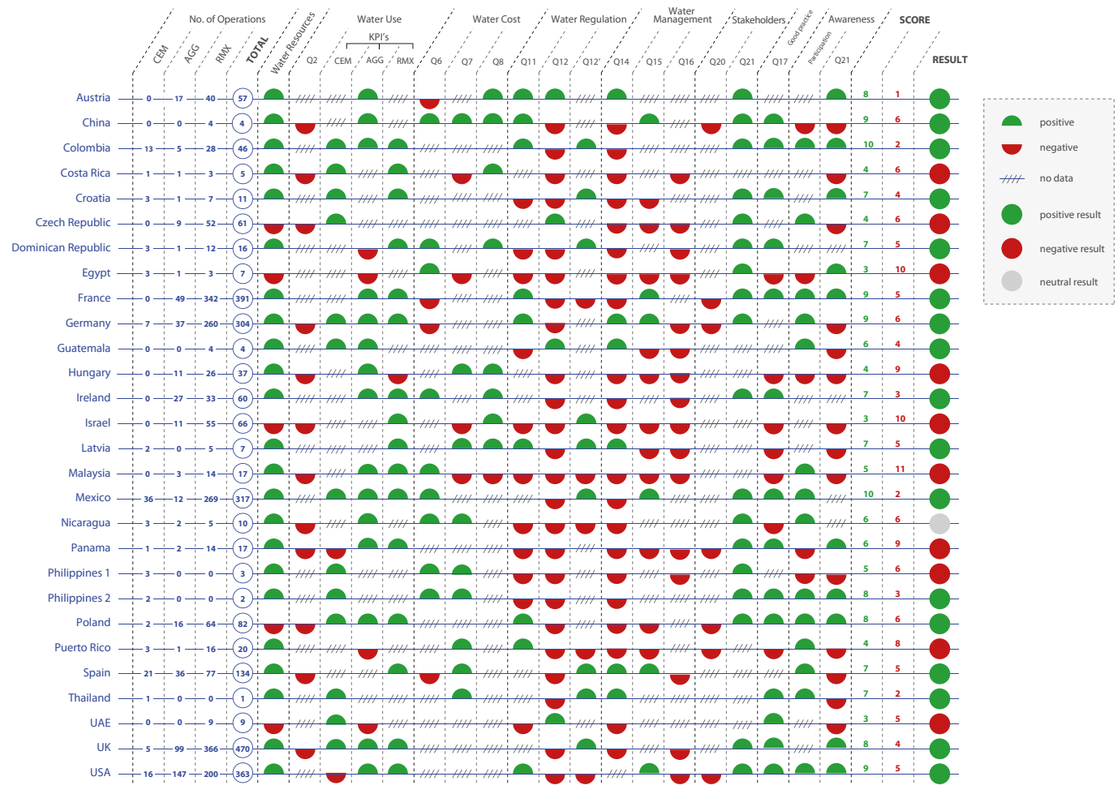


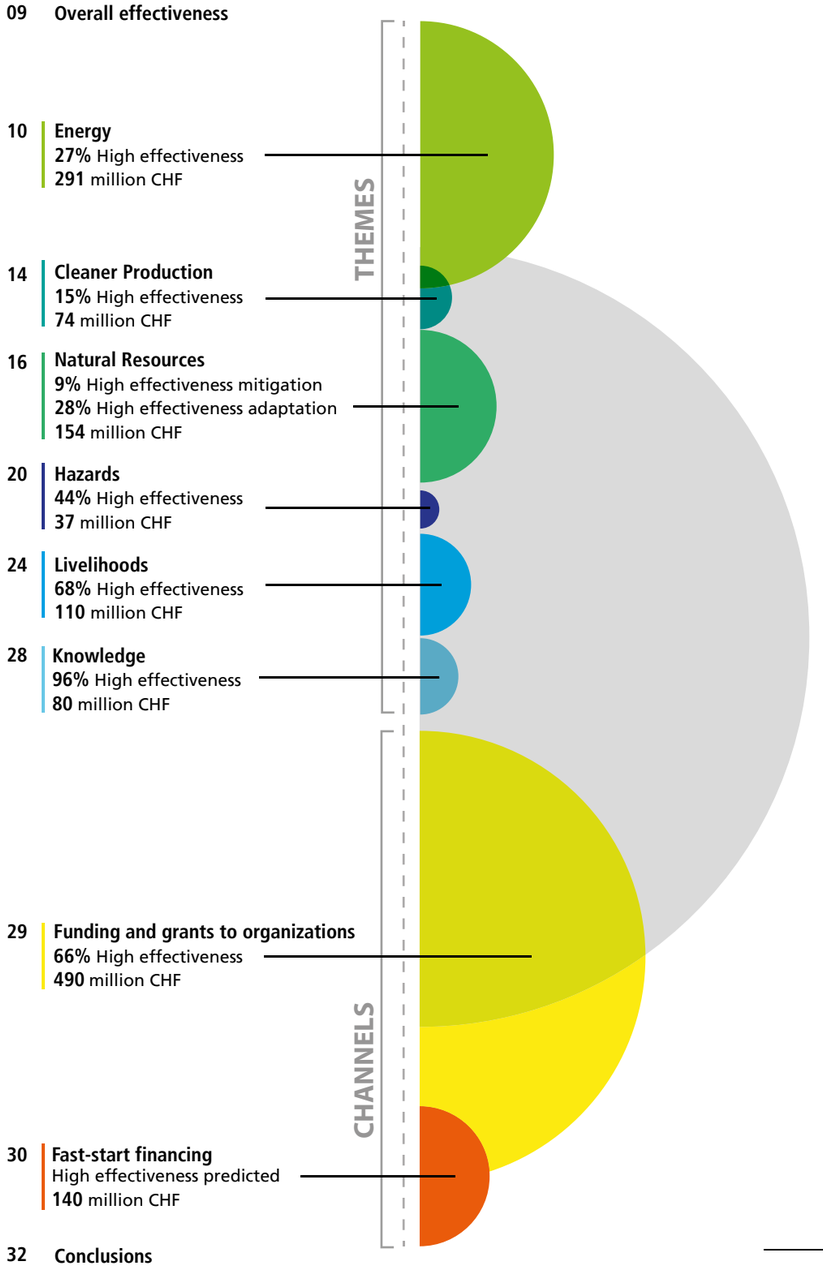


Cement and Aggregates
IUCN Global Water Programme, 2013



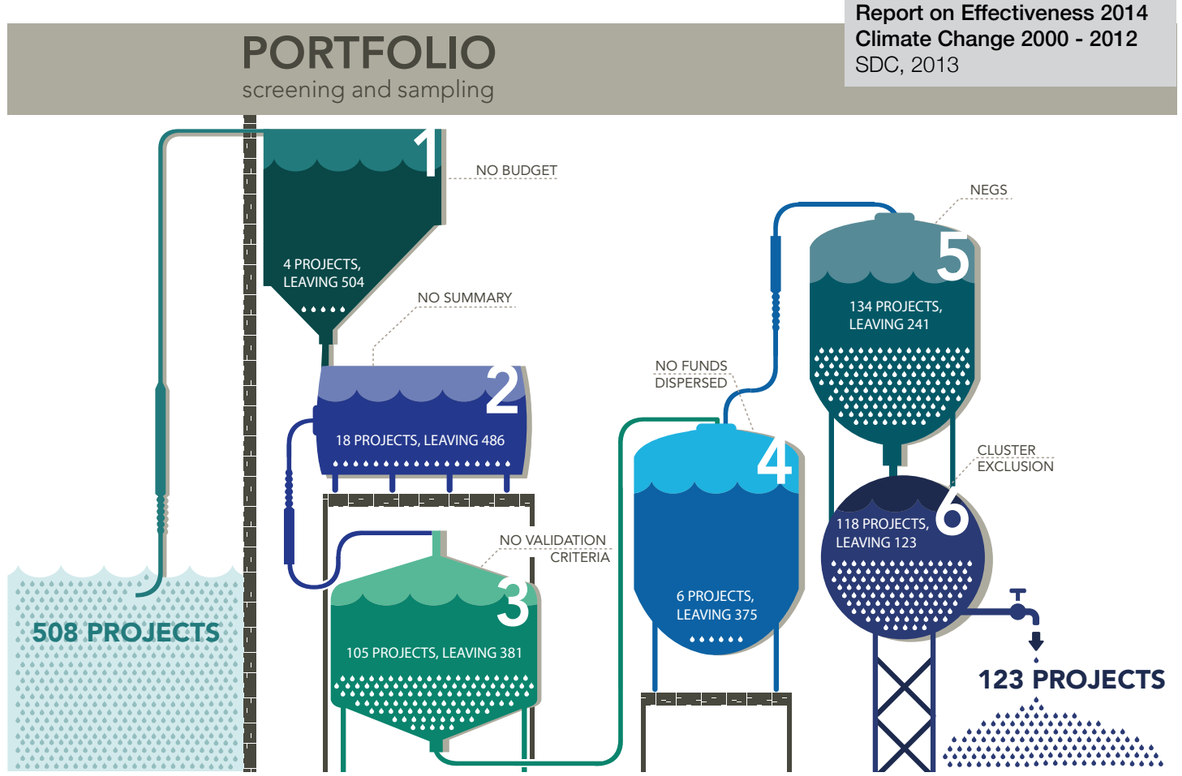
Cement and Aggregates
IUCN Global Water Programme, 2013



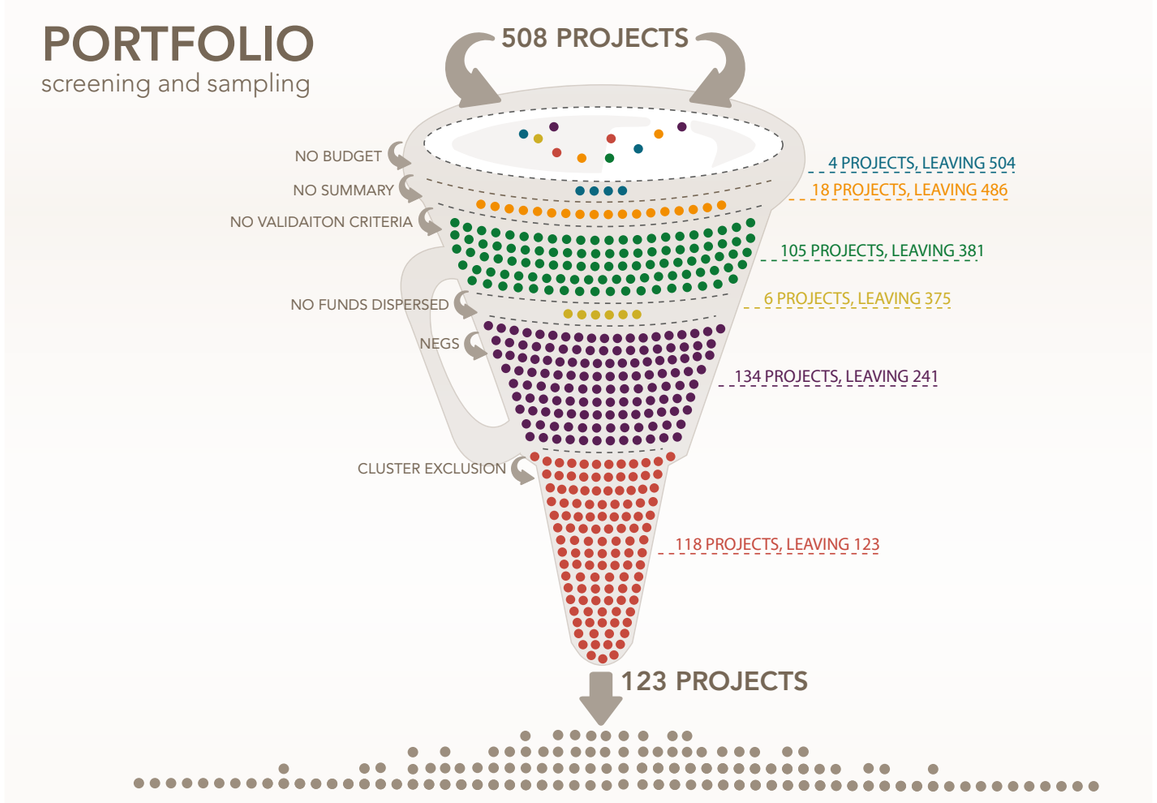


SDC/SECO
Portfolio

Report on Effectiveness 2014
Climate Change 2000 - 2012
SDC, 2013



Report on Effectiveness 2014
Climate Change 2000 - 2012
SDC, 2013



Risques

Accentuation des fortes chaleurs
- Dégradation de la santé humaine
- Baisse de la productivité au travail
- Augmentation du besoin en énergie de refroidissement

Accroissement de la sécheresse
- Pertes de récoltes agricoles
- Risque d'incendies de forêt
- Pénuries d'eau
- Diminution de la production hydroélectrique estivale

Élévation de la limite des chutes de neige
- Baisse des revenus du tourisme hivernal

Aggravation du risque de crues
- Dommages corporels
- Dommages matériels

Fragilisation des pentes et recrudescence des mouvements de terrain
- Dommages corporels
- Dommages matériels

Dégradation de la qualité de l'eau, des sols et de l'air

Modification des milieux naturels, de la composition des espèces et des paysages
- Dégradation de la biodiversité

Propagation d'organismes nuisibles, de maladies et d'espèces exotiques
- Dégradation de la santé humaine
- Dégradation de la santé des animaux de rente et des animaux de compagnie
- Pertes de récoltes agricoles
- Dégradation des services écosystémiques forestiers

Risques wildcards
- Risques difficiles à évaluer

Modifications du climat à l'étranger
- Risques indirects

Risques ou opportunités

Impacts ambigus : conséquences positives ou négatives possibles

Modification de l'activité des tempêtes et de la grêle
- Dommages corporels
- Dommages dus aux tempêtes
- Dommages dus à la grêle

Impacts positifs et négatifs

Impacts positifs et négatifs

Impacts positifs et négatifs

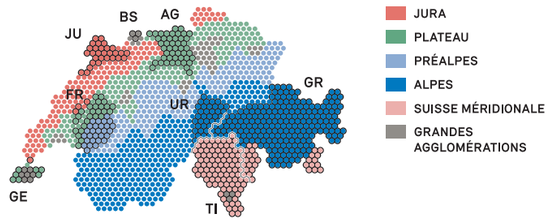
Opportunités

Amélioration des conditions locales
- Diminution du besoin en chauffage
- Revenus du tourisme estival
- Augmentation des récoltes agricoles

- Augmentation de la production énergétique hivernale
- Dommages et frais d'entretien liés à la neige

- Modification de la composition des espèces et des milieux

- Opportunités indirectes



Risques et opportunités liés au climat
FOEN, 2017

Augmentation de l'opportunité :
- légère

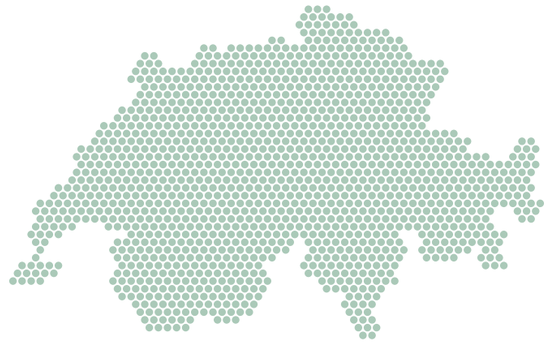
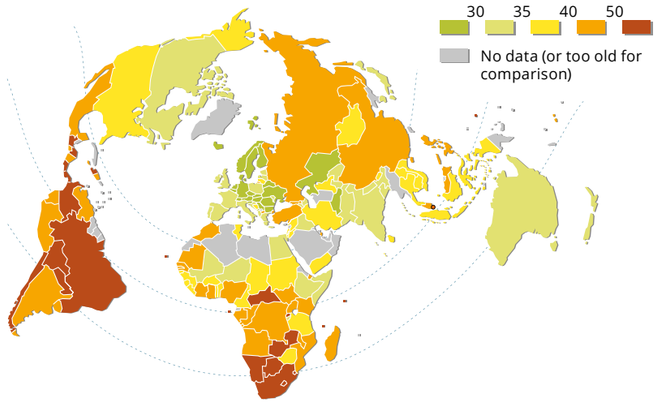


Figure 5.2 National GINI coefficient values



The Gini index measures the extent to which, within a country, the distribution of income deviates from perfect equality. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

Sources: World Development Indicators, World Bank ; OECD Income distribution and poverty database ; US Central Intelligence Agency World Factbook ; 2014 (data: 2000 to 2012).

Figure 1.3 Population pyramids for Europe, Africa and Asia for 2000 and 2050 by age, sex and educational attainment

Source: Samir K.C. et al, 2010. Projection of populations by level of educational attainment, age, and sex for 120 countries for 2005-2050, IIASA.

The European environment – state and outlook
EEA, 2014

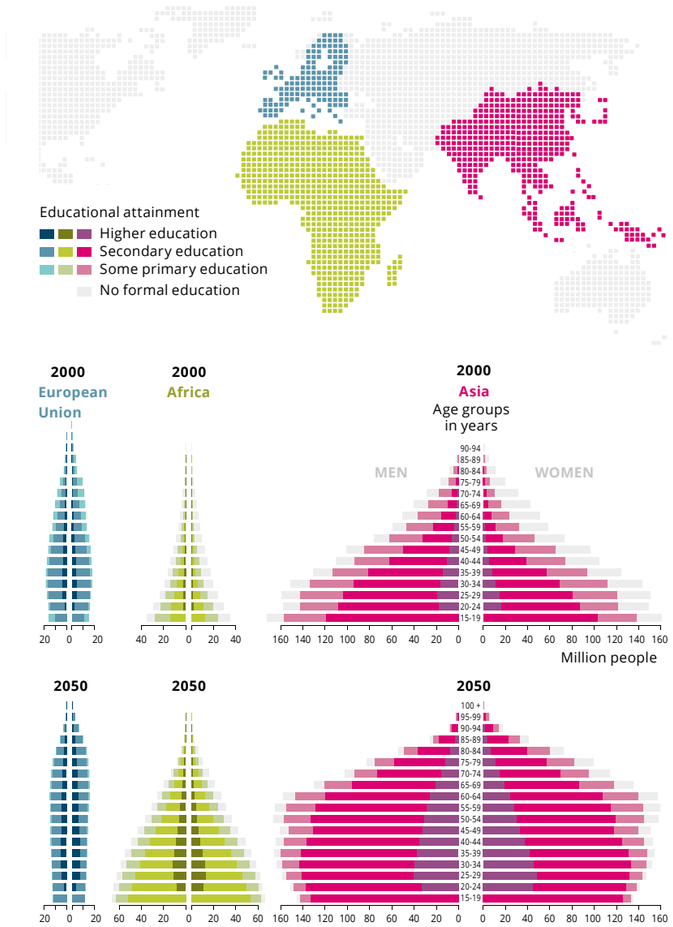
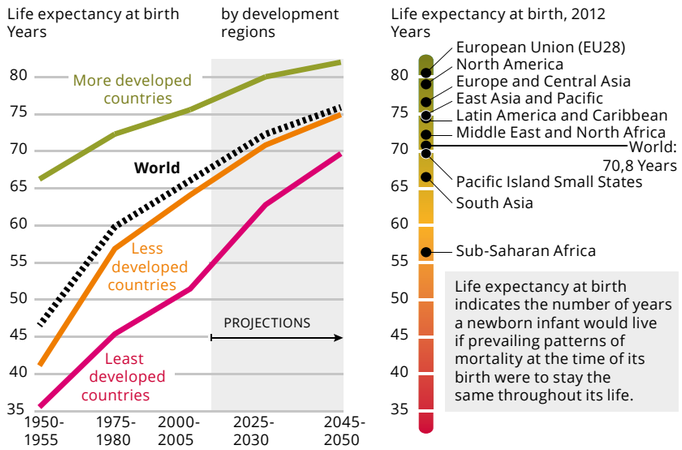


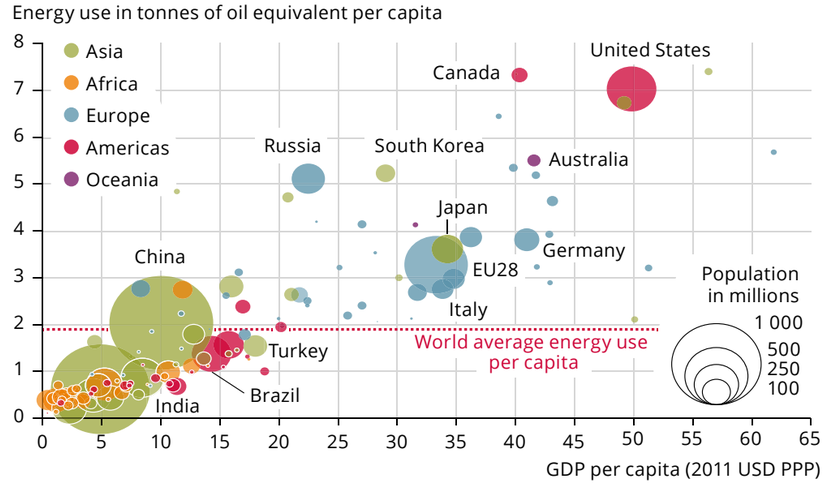
Figure 3.2 Life expectancy at birth by world regions until 2050



Source: World Development Indicators, World Bank, 2014.

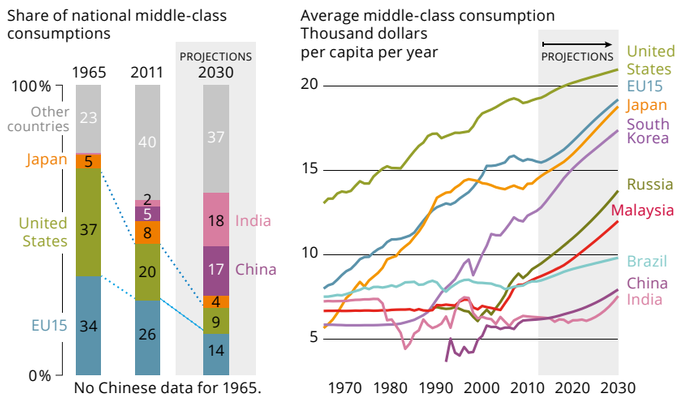
The European environment – state and outlook
EEA, 2014

Figure 7.2 Correlation between energy use and gross domestic product, 2011.



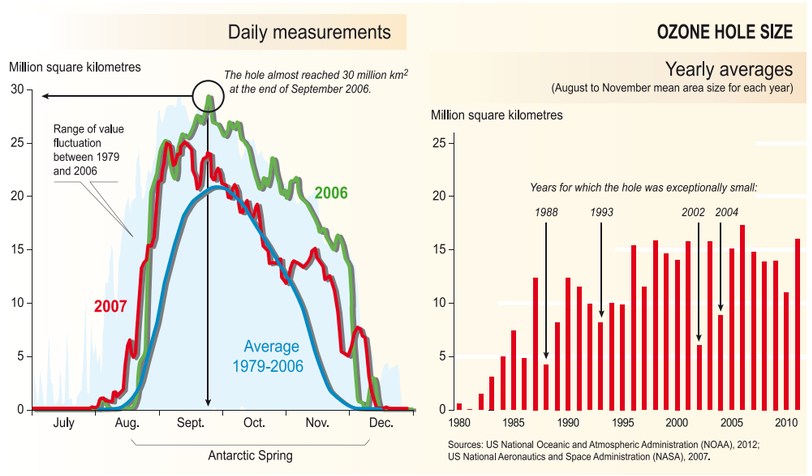
European Union countries are represented both individually and collectively (EU28).
Sources: World Development Indicators, World Bank, 2014.

Fig 2.3 Middle class consumption, 1965-2030

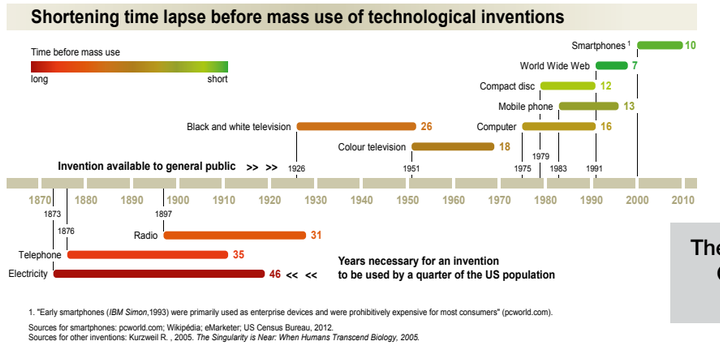


Source: Brookings Institution, 2013.

Vital Ozone graphics 3
UN Environment, 2012

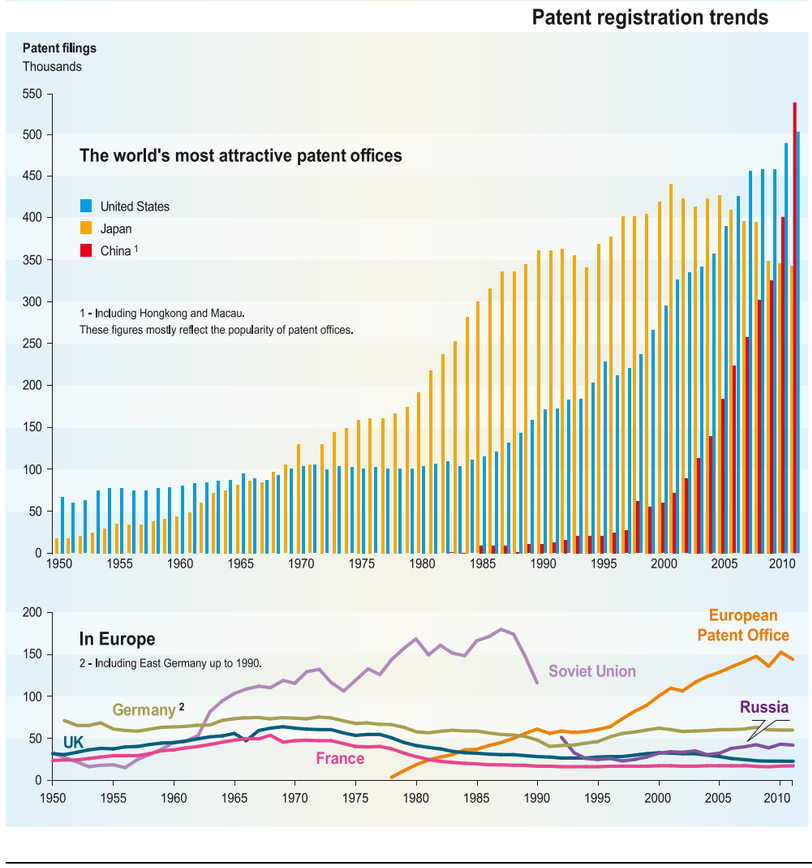


The European Environment: Global Megatrends, 2010
EEA, 2010

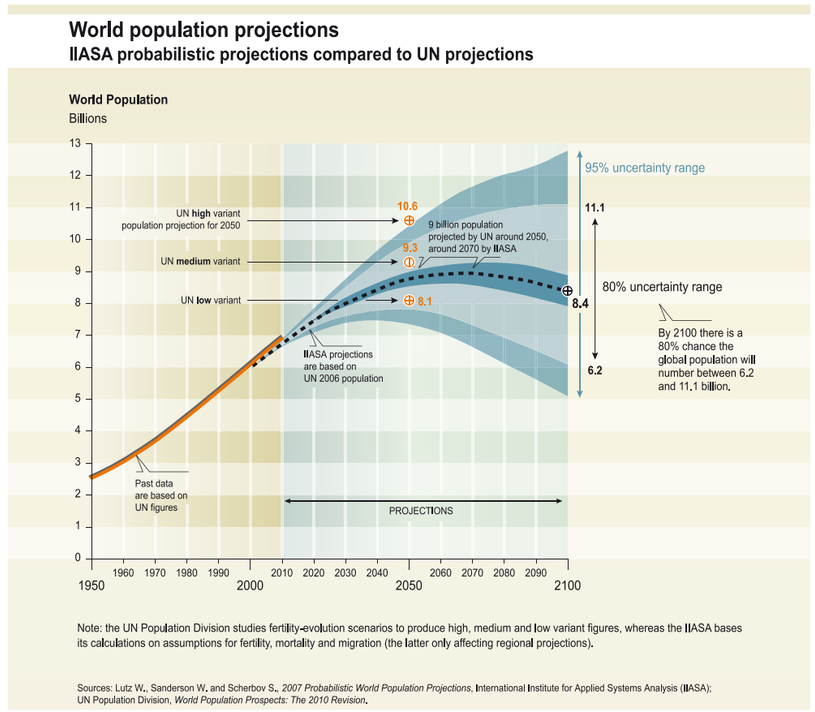


1. "Early smartphones (*IBM Simon*,1993) were primarily used as enterprise devices and were prohibitively expensive for most consumers" (pcworld.com).

Sources for smartphones: pcworld.com; Wikipédia; eMarketer; US Census Bureau, 2012.
Sources for other inventions: Kurzweil R. , 2005. *The Singularity is Near: When Humans Transcend Biology, 2005.*

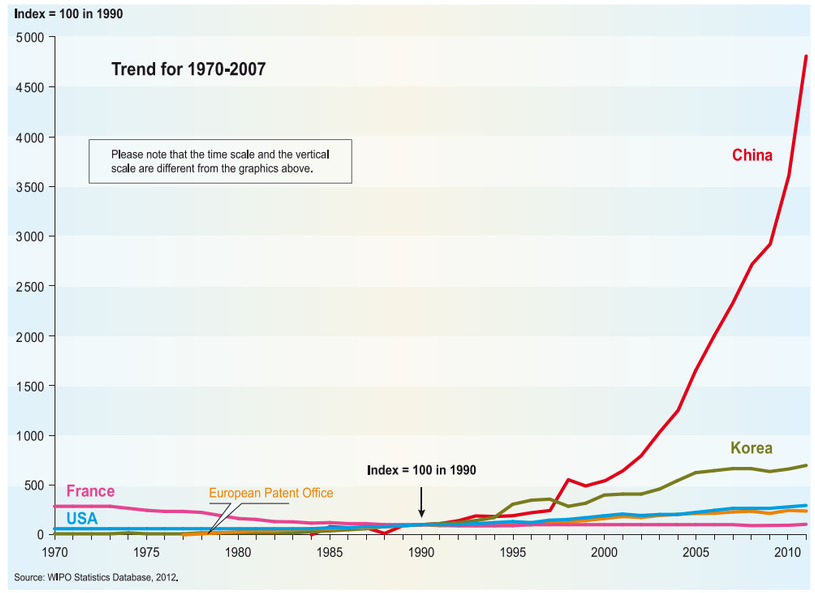


The European Environment: Global Megatrends, 2010
EEA, 2010



Note: the UN Population Division studies fertility-evolution scenarios to produce high, medium and low variant figures, whereas the IIASA bases its calculations on assumptions for fertility, mortality and migration (the latter only affecting regional projections).

Sources: Lutz W., Sanderson W. and Scherbov S., *2007 Probabilistic World Population Projections*, International Institute for Applied Systems Analysis (IIASA);
UN Population Division, *World Population Prospects: The 2010 Revision*.



Source: WIPO Statistics Database, 2012.

West Balkans protected areas

Areas protected
Square kilometres

8 000
5 000
2 000
300

CROATIA
share of marine areas
12%
SERBIA [1]
BOSNIA AND HERZEGOVINA
FORMER YUGOSLAV REPUBLIC OF MACEDONIA
MONTENEGRO
1%
ALBANIA
3%

1 - including Kosovo

Please note:
The same site can be protected under different status.
Overlaps have been removed and areas rounded for the proportional square sizes calculation (opposite) but not for the national percentage calculation below.
Some areas represented below are not recognized internationally.

Designated sites

2 - under UN Security Council Resolution 1244 (1999).

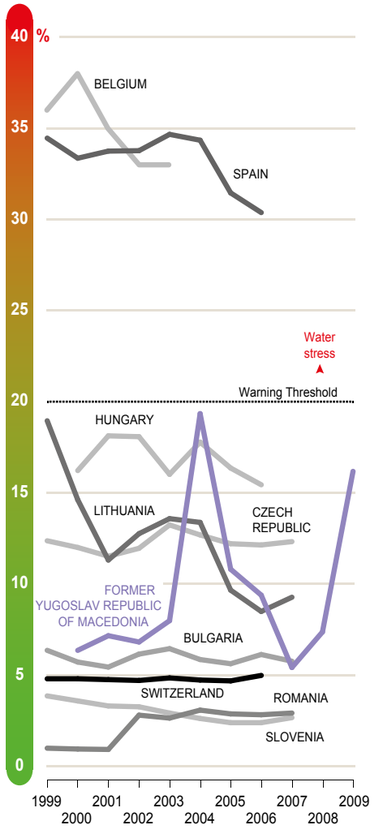
Sources: Common Database on Designated Areas, EEA, 2011;
World Database on Protected Areas, UNEP-WCMC, IUCN, 2011.

West Balkan Environmental Core Set of Indicators
EEA, 2012

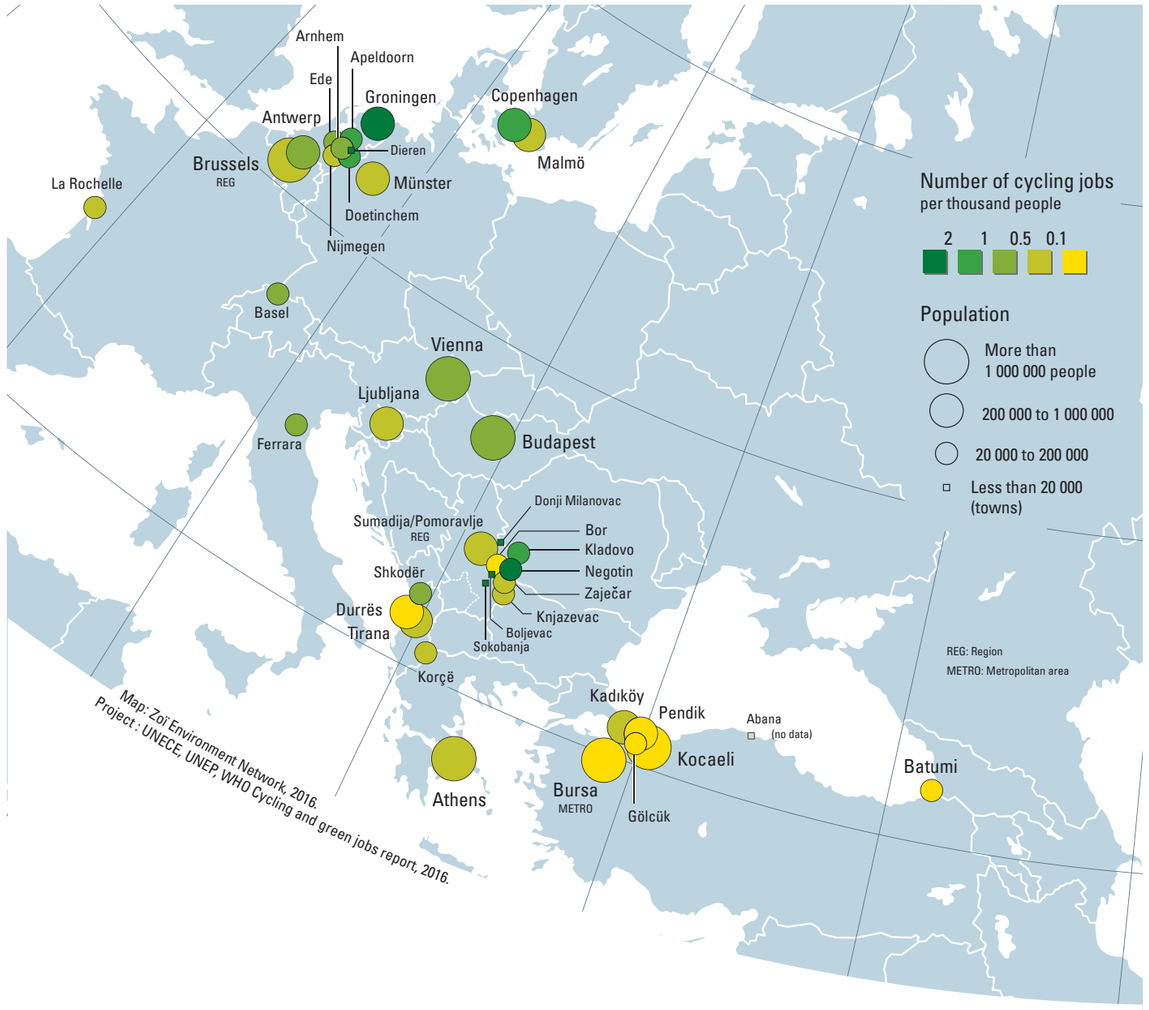
Water exploitation index

Selected European countries

Water abstraction
as a percentage of available
long-term freshwater resources



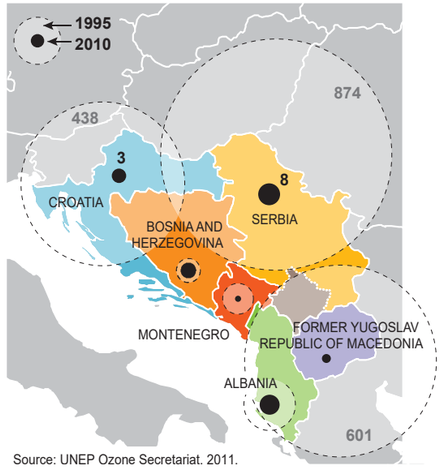
Sources: Eurostat, 2009; EEA, 2010; State Statistical Office and Water Economy Administration, Public Enterprises for Water Supply and Sewage System in the former Yugoslav Republic of Macedonia, 2011; Raskin et al. 1997.



Map: Zoï Environment Network, 2016.
Project : UNECE, UNEP, WHO Cycling and green jobs report, 2016.

1995-2010 evolution

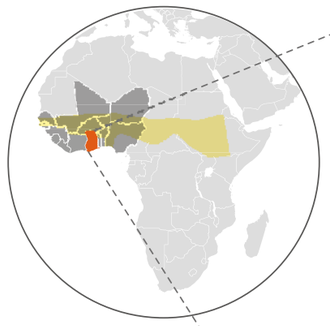
Consumption of
ozone-depleting substances



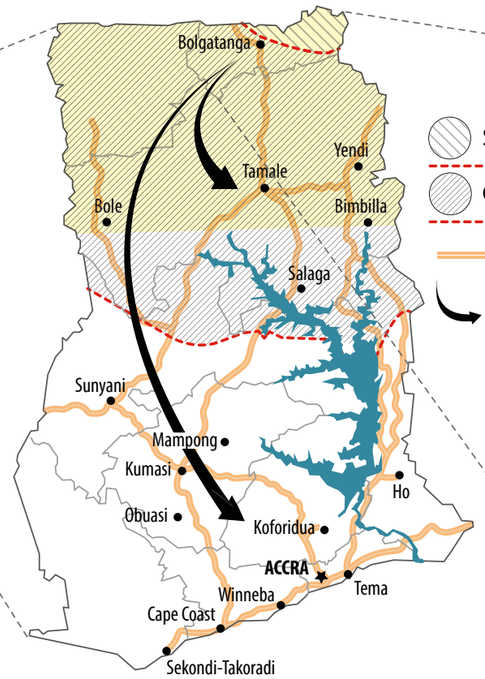
Source: UNEP Ozone Secretariat. 2011.

West Balkan Environmental Core Set of Indicators
EEA, 2012

CLIMATE CHANGE MIGRATION CASE STUDY: UPPER EAST GHANA

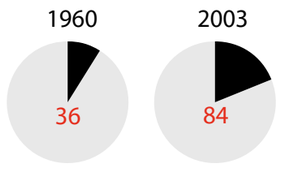


West Africa
Ghana
Meningitis Belt

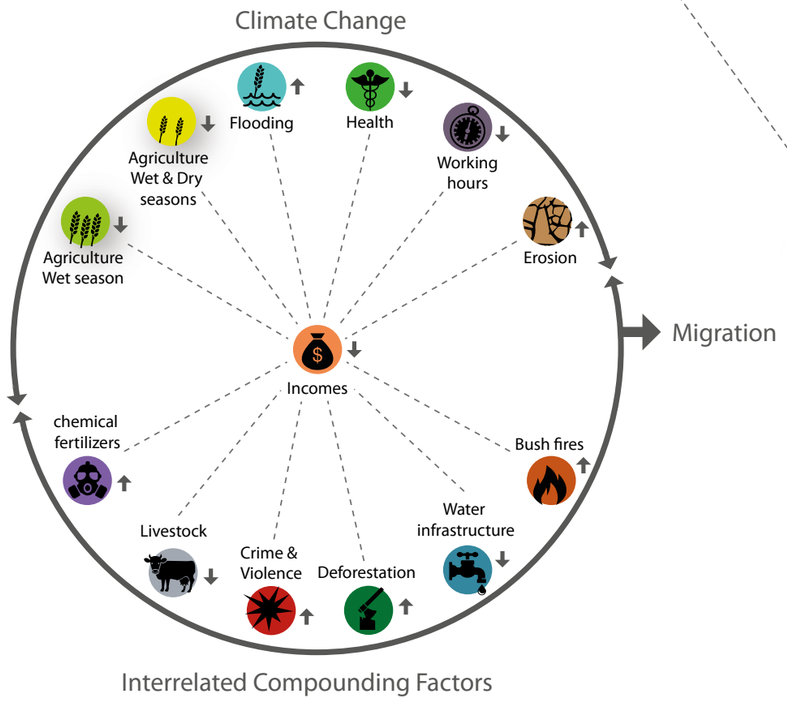


Climate shift in Ghana

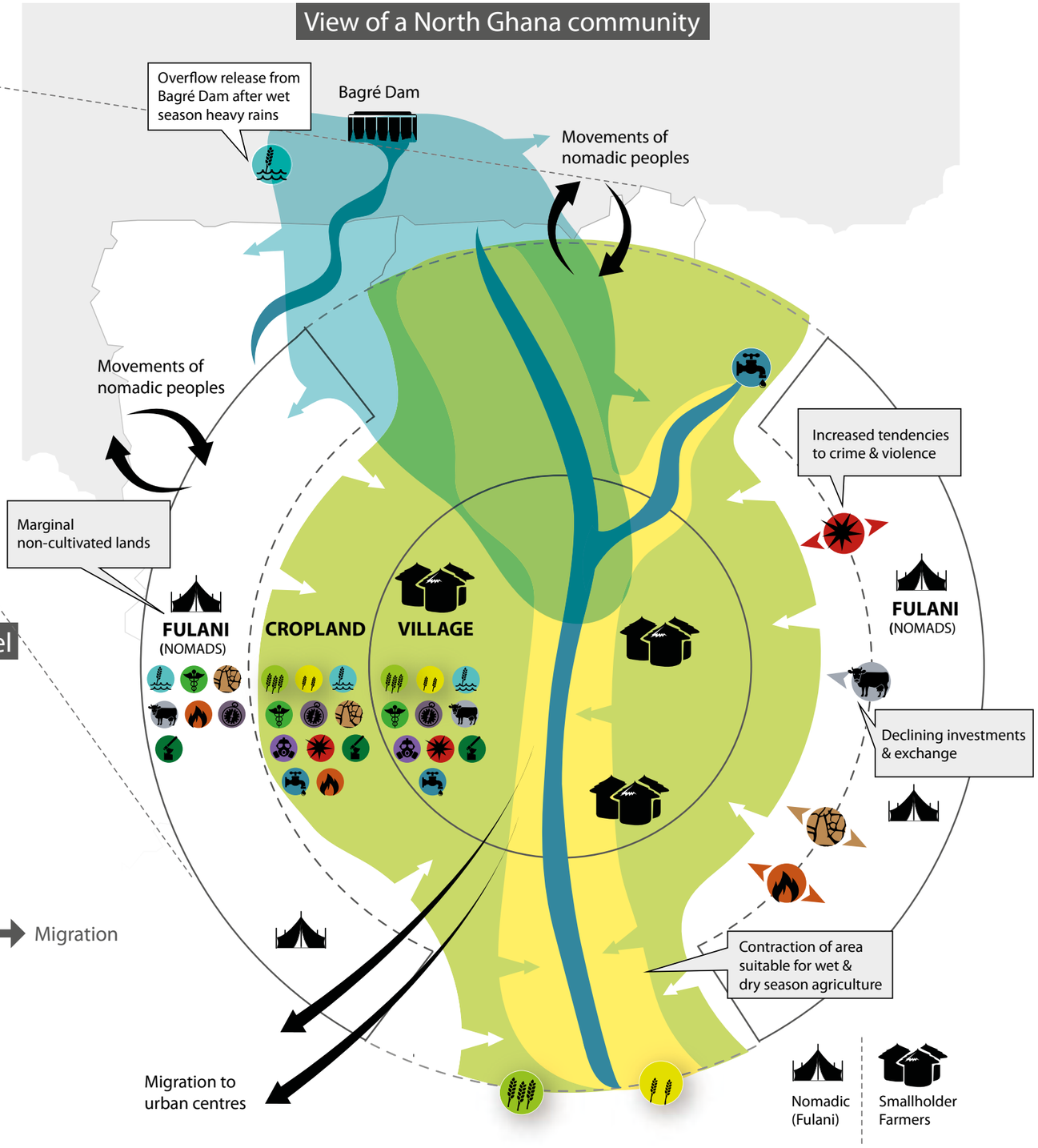
Extreme hot days



Climate change dynamics at community level



View of a North Ghana community

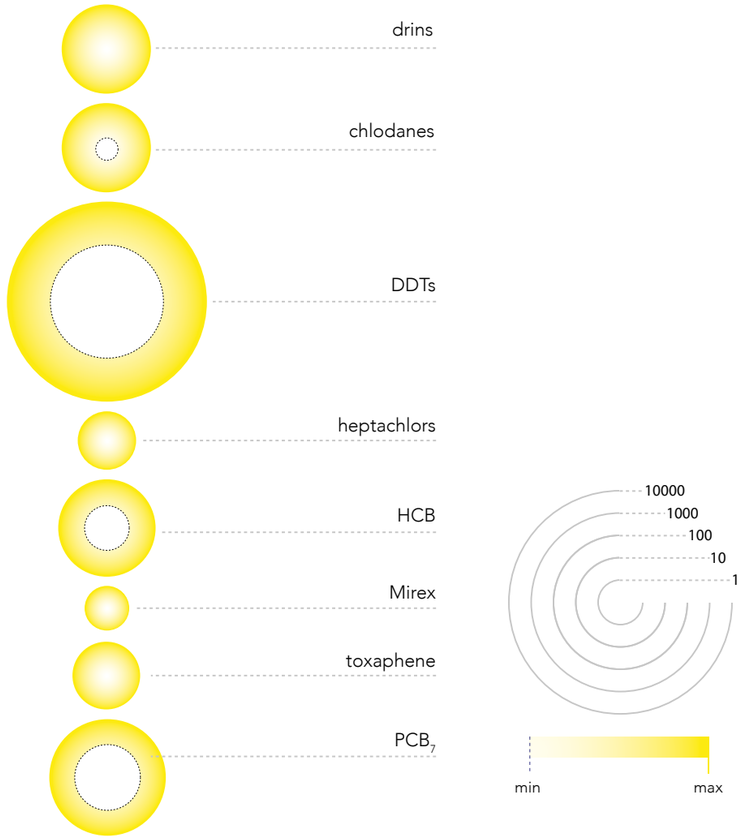


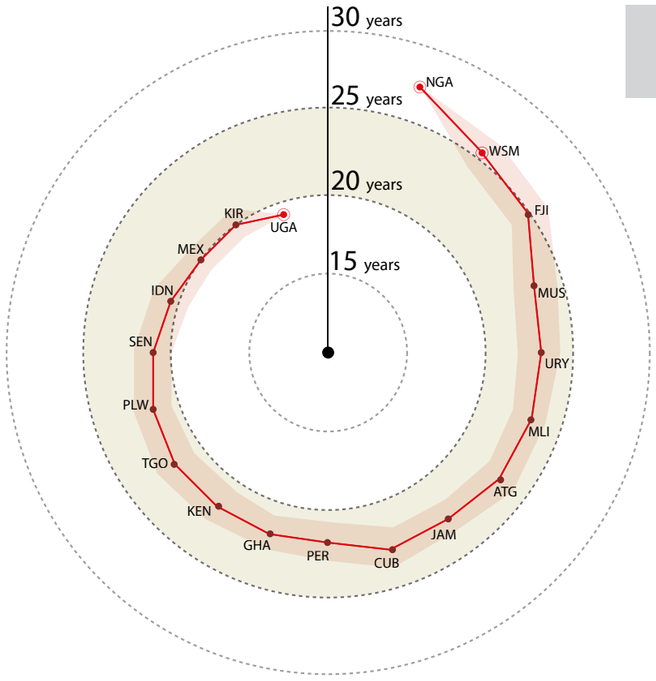
Climate change migration
Case study - Ghana
UNDP, 2015

Sources: DARA & the Climate Vulnerable Forum (2012)
Credits: M.O. McKinnon (UNDP Geneva) and E. Tachie-Obeng (EPA-Ghana)
Layout & design: Zoï Environment Network

Summary of results of 9 POPs in mothers'milk

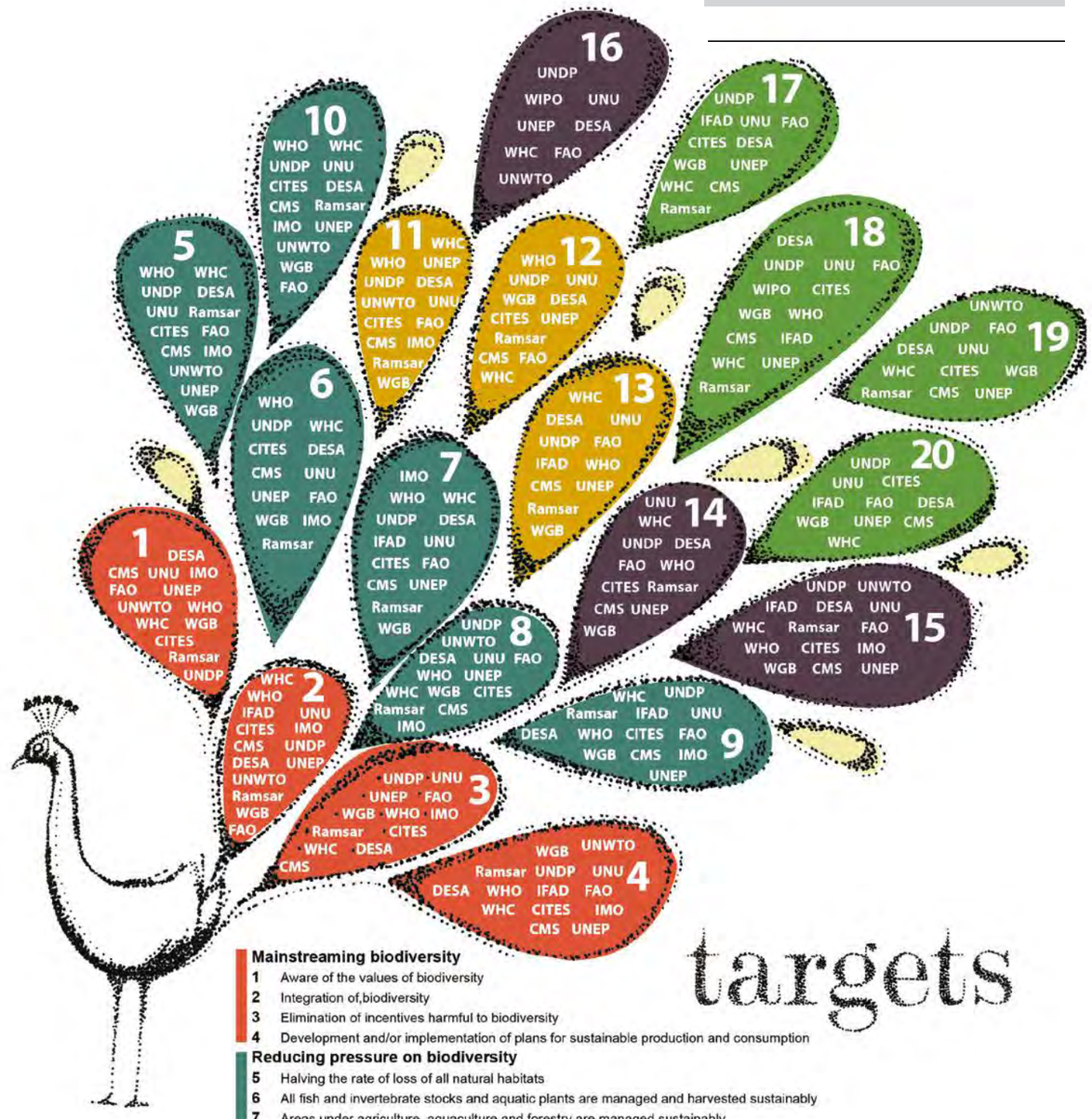
UNIT → ng g⁻¹fat





Persistent Organic Pollutants in the Mothers' Milk
UN Environment, 2012

UN Strategic Plan for Biodiversity 2011-2020
EMG, 2012



Indicators
Alazani / Ganykh Basin
UNECE, 2015

Georgia and Azerbaijan
Total water resources 97,606 million m³ / year
Total water withdrawal 14,024 million m³ / year

River length 391 km
River basin area 11,717 km²

Alazani / Ganykh basin

Basin water resource
7,100 million m³ / year

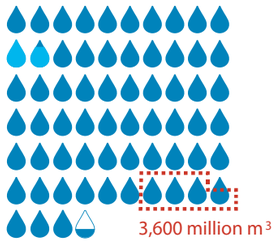
Georgia

TOTAL RENEWABLE FRESHWATER RESOURCES

63,330 million m³ / year
of which,
water withdrawal:
1,823 million m³

Agriculture 58.2%
Industry 22.1%
Municipal 19.8%

NB: national percentages (no data available at the basin scale)



INSTALLED ELECTRICITY GENERATING CAPACITY & HYDROPOWER

4,308 kW
of which, hydropower:
2.6 million kW

Hydropower 61 %
Fossil fuel 39 %

AGRICULTURAL LAND

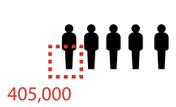
4,000 km²

GROSS DOMESTIC PRODUCT

15,700 million dollars

POPULATION

5 million people



Azerbaijan

TOTAL RENEWABLE FRESHWATER RESOURCES

34,680 million m³ / year
of which,
water withdrawal:
11,970 million m³

Agriculture 84,4 %
Industry 12.8 % (est.)
Municipal 2.8 % (est.)

NB: national percentages (no data available at the basin scale)

INSTALLED ELECTRICITY GENERATING CAPACITY & HYDROPOWER

7,114 kW
of which, hydropower:
1.1 million kW

Fossil fuel 85 %
Hydropower 15 %

AGRICULTURAL LAND

19,000 km²

NB: no data available at the basin scale

GROSS DOMESTIC PRODUCT

66,600 million dollars

NB: no data available at the basin scale

POPULATION

9 million people

Sources: FAO Aquastat ; US EIA International Energy Statistics ; Word Bank , 2015.

Indicators
Drina Basin
UNECE, 2015

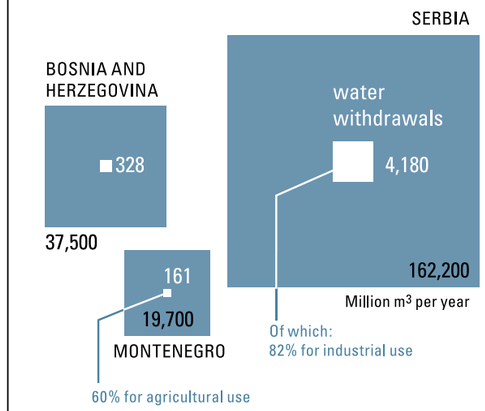
Drina Basin

River length
335 km

River basin area
20,320 km²

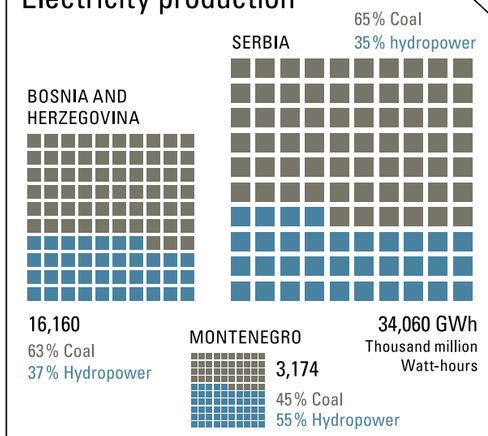
Water use
74 million m³/year

Water resources



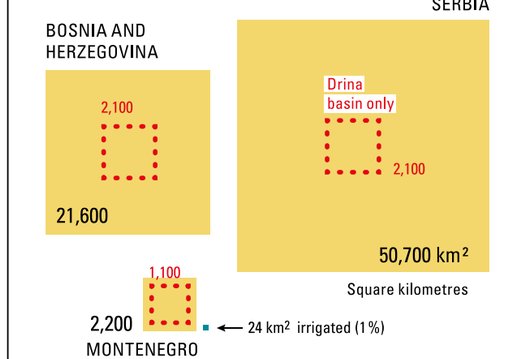
Source: FAO Aquastat, 2014.

Electricity production



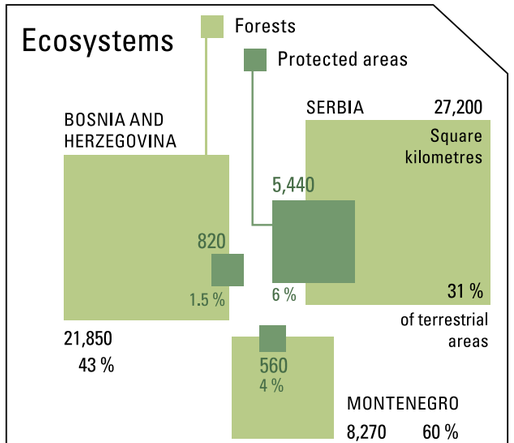
Source: US International Energy Agency, 2017 (data: 2014).

Agricultural land



Source: FAOSTAT, 2014.

Ecosystems



Sources: FAOSTAT,
2014; World Database on Protected Areas, UNEP- WCMC, 2016.

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