Climate, Environment and Education

(as child's play)

What? Why? How?

Colin Bangay

The jigsaw

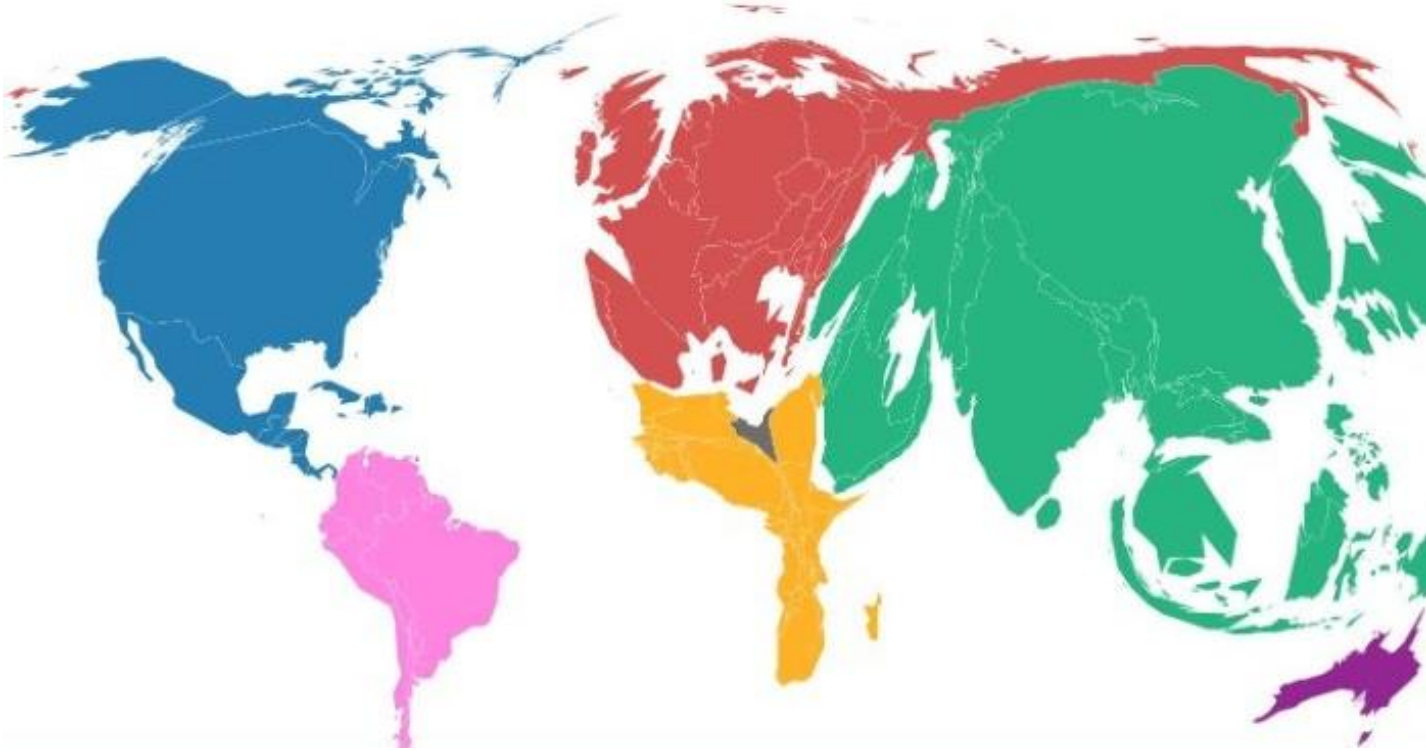
Who is responsible for climate change?

Climate change is driven by gas emissions. These come from burning fossil fuels – coal, gas and petrol.

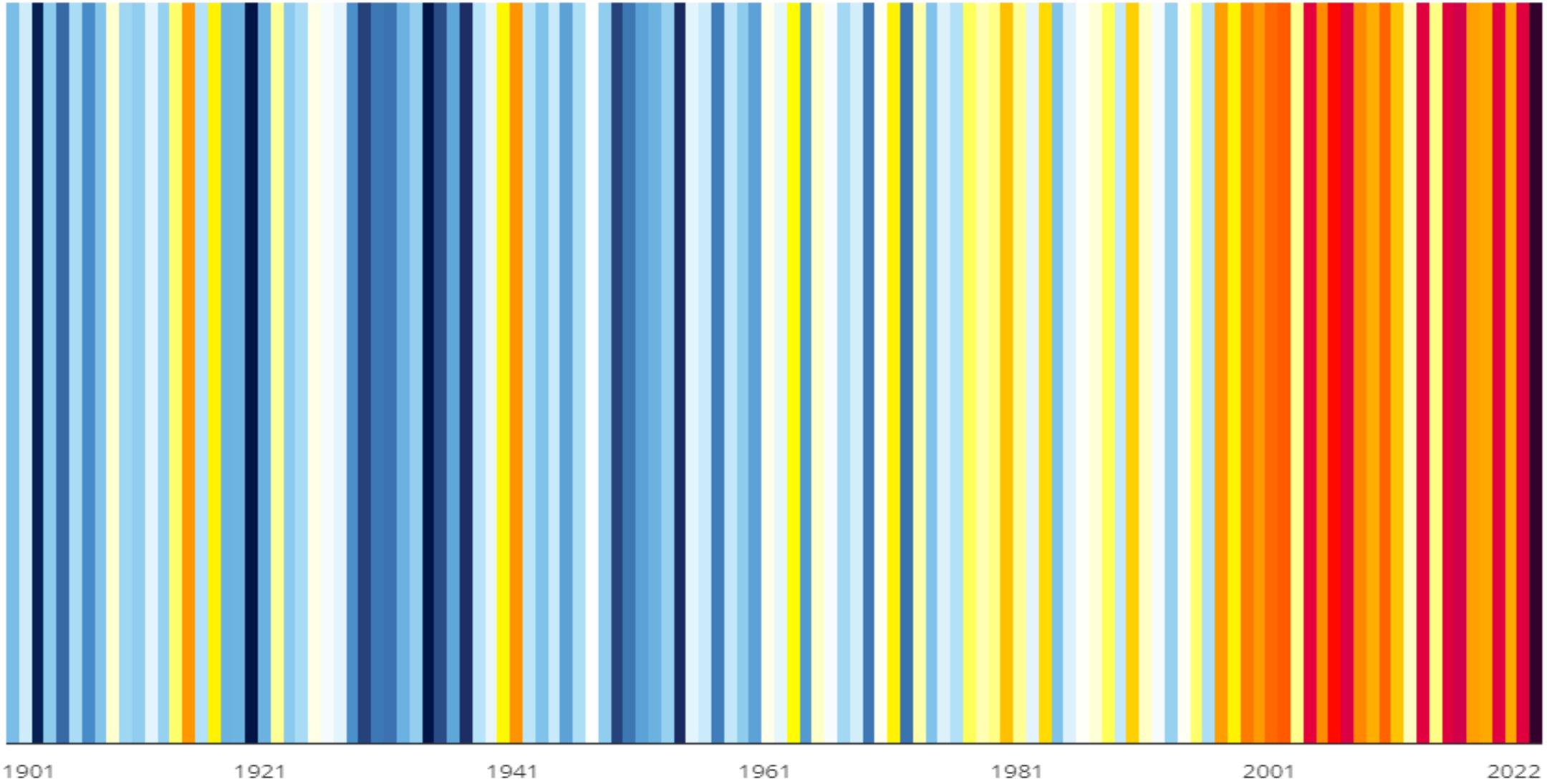
It is the industrialised countries that are historically responsible for climate change.

Currently most LMICs make little contribution to climate change. However, they will bear the brunt of its impact.

No single country can stop climate change – all countries need to both adapt to, and engage in, longer-term mitigation against climate and environmental issues.



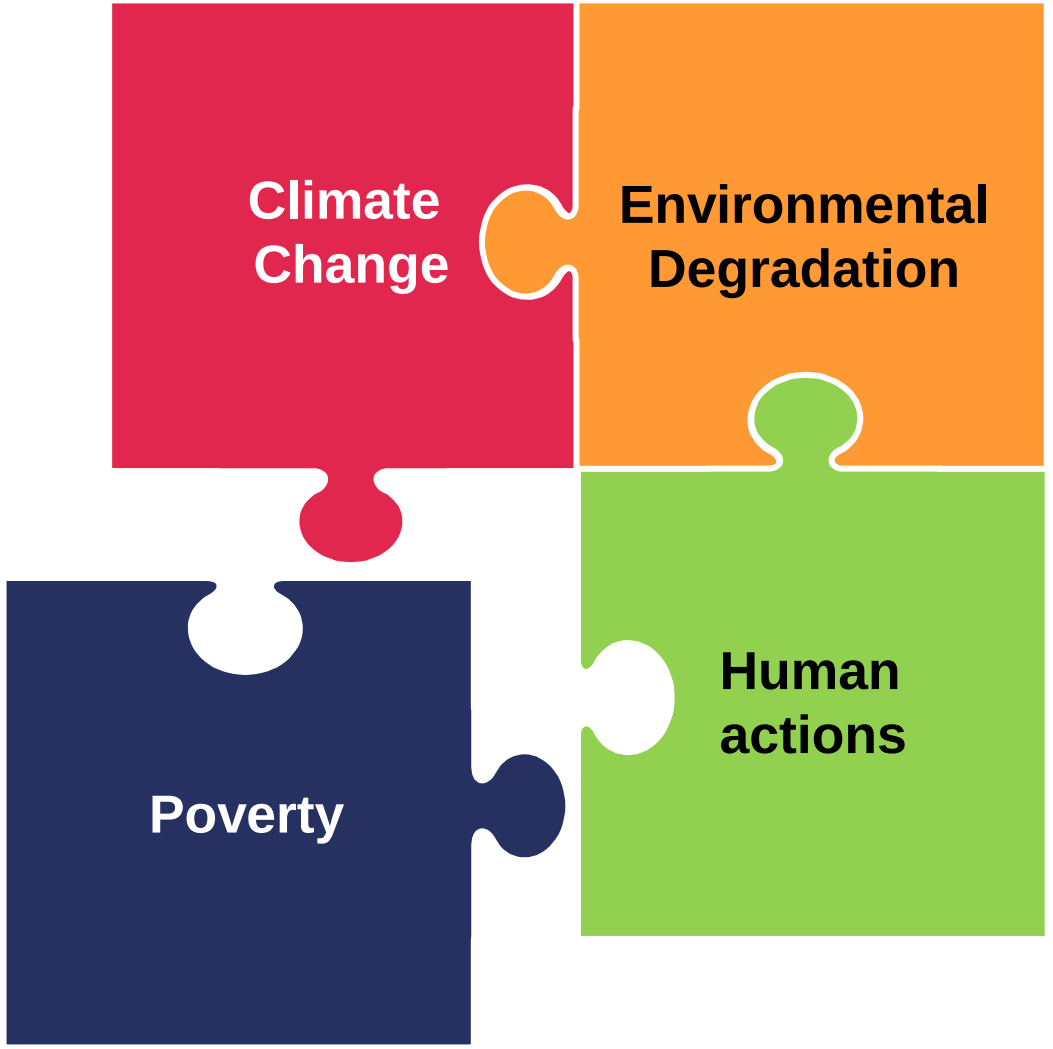
Observed annual average mean surface air temperature, 1901-2022, Krgyz Republic



Kyrgyz Republic - Summary | Climate Change Knowledge Portal (worldbank.org)

It isn’t just about climate change

- Climate is a component of environment.
- Challenges result from the interplay between climate change and human actions, which can cause environmental degradation.
- A ‘climate only’ focus rightly draws attention to global emissions contributions – but ….
- Meaningful solutions at national and local level require focus on broader environmental and livelihood challenges.



[Framing the challenge: Education and the climate-environment emergency | Blog | Global Partnership for Education]

Climate Change

(Extreme rainfall)

Environmental Degradation

(De-forestation)

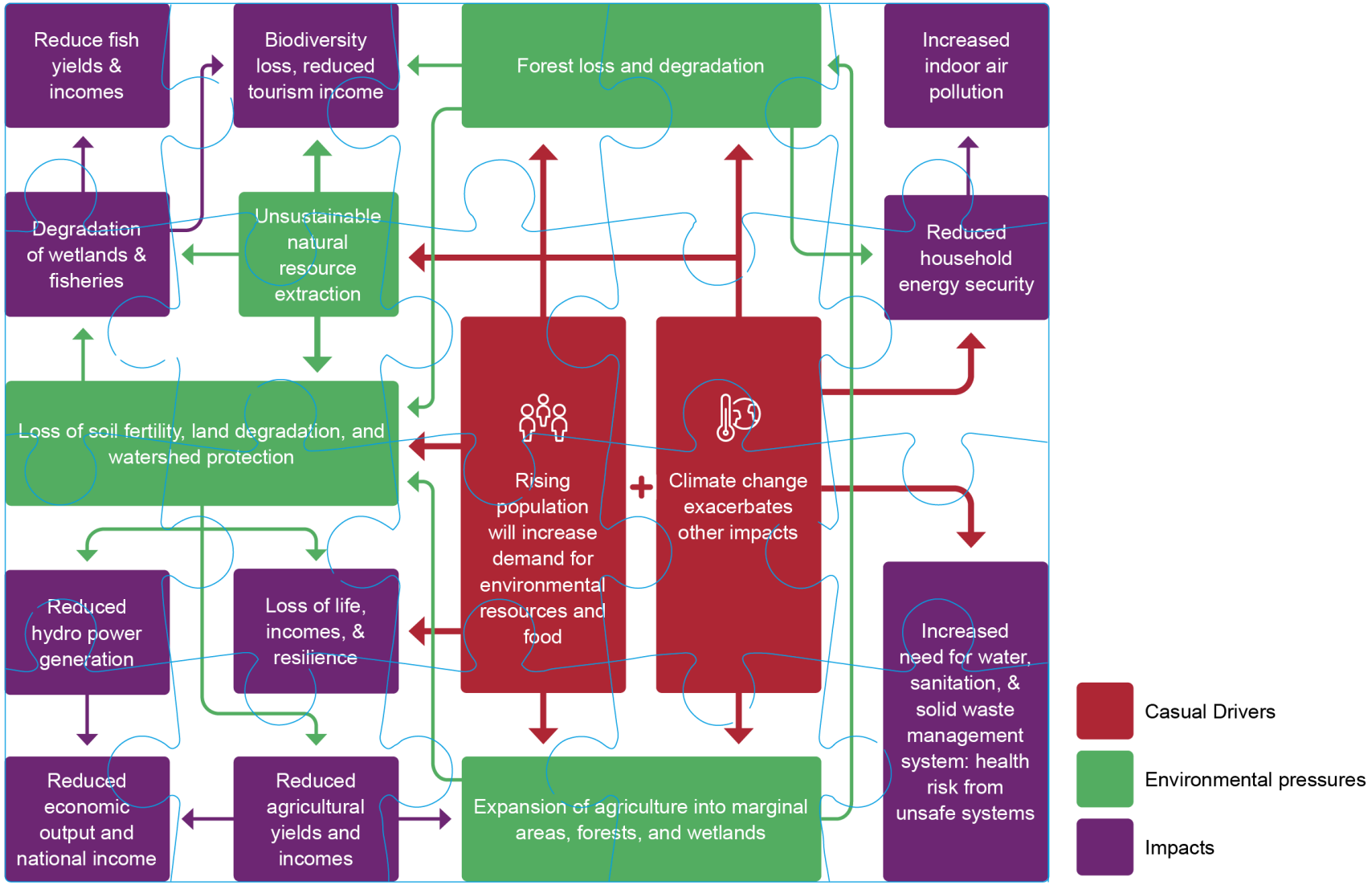
Poverty

(Informal settlements on steep land)

Human Actions

(Poor landuse regulations)

Drivers, pressures, impacts – a useful model



[World Bank: Malawi Country Environmental Analysis January]

Snakes and Ladders

More snakes than ladders ……

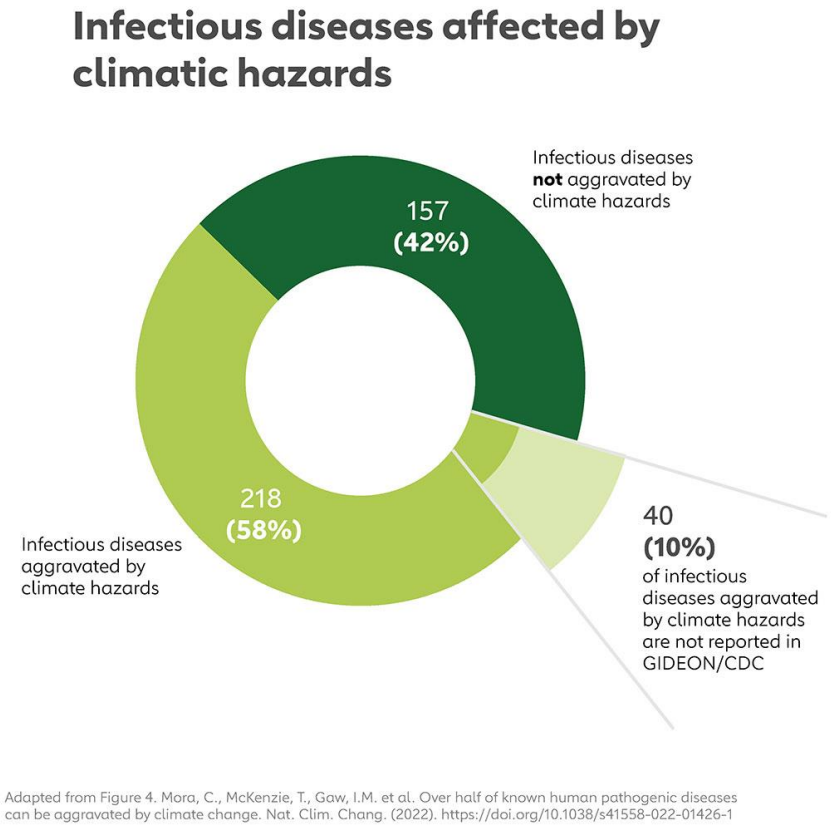
- More frequent extreme weather events will increasingly damage classrooms, schools and attendance.
- Money spent on rebuilding and repairing schools can’t be spent on quality improvement.

Climate impacts on education

Direct / Supply Side Factors
Destruction of schools through flooding / fire.
Large scale displacement of populations from flooded areas.
Displacement of children from schools when being used as community refuges.
Disruption of school calendars – examinations, textbook delivery etc.
Sub-optimal building design results in hot and poorly ventilated classrooms, which impede learning.

Climate Impacts on Education

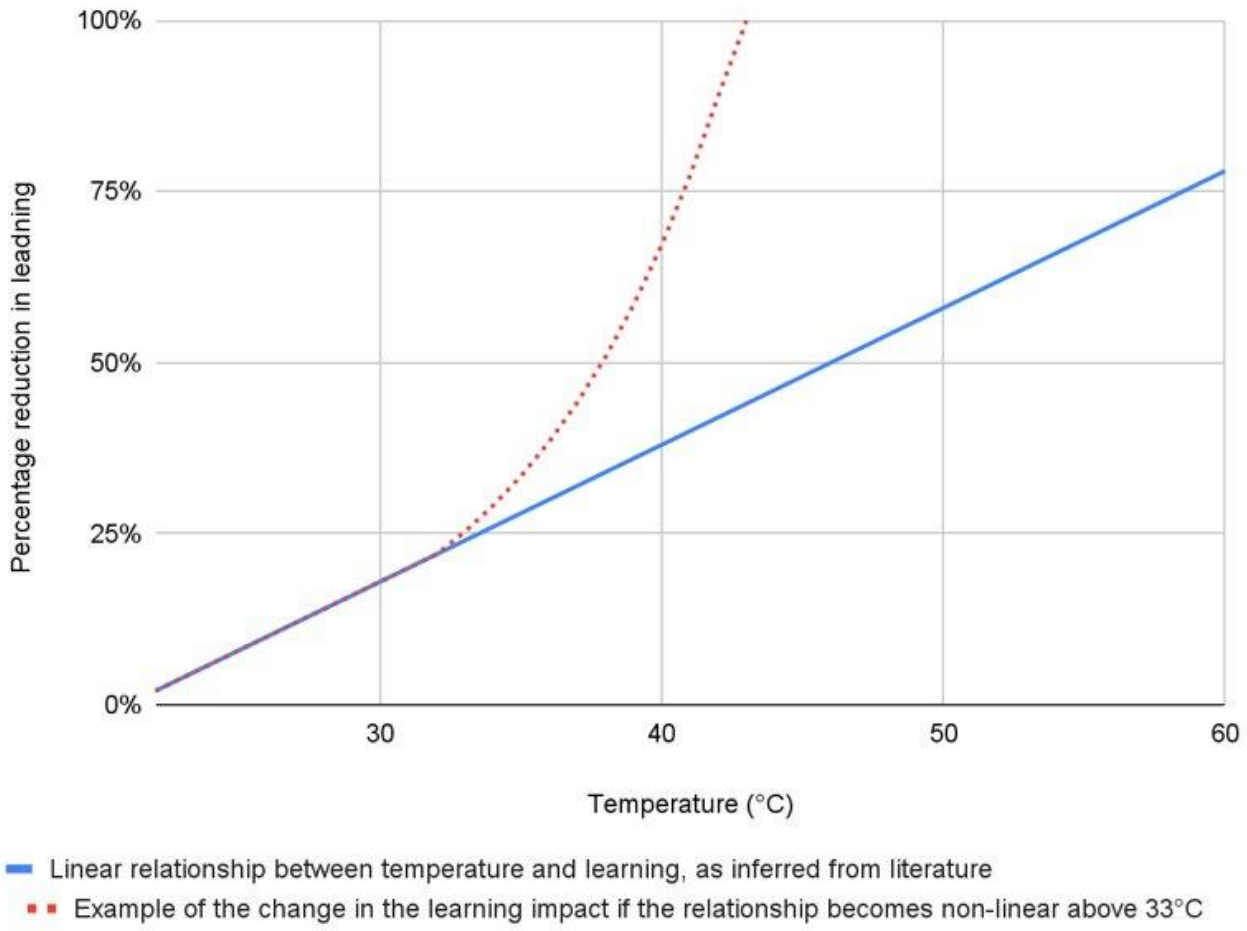
Indirect / Demand Side Factors
Deteriorating livelihoods reduce household income – choices are made on which children are sent to school.
Malnutrition reduces capacity to learn.
Increased disease prevalence (e.g. Malaria, cholera) reduces both teacher and student attendance.



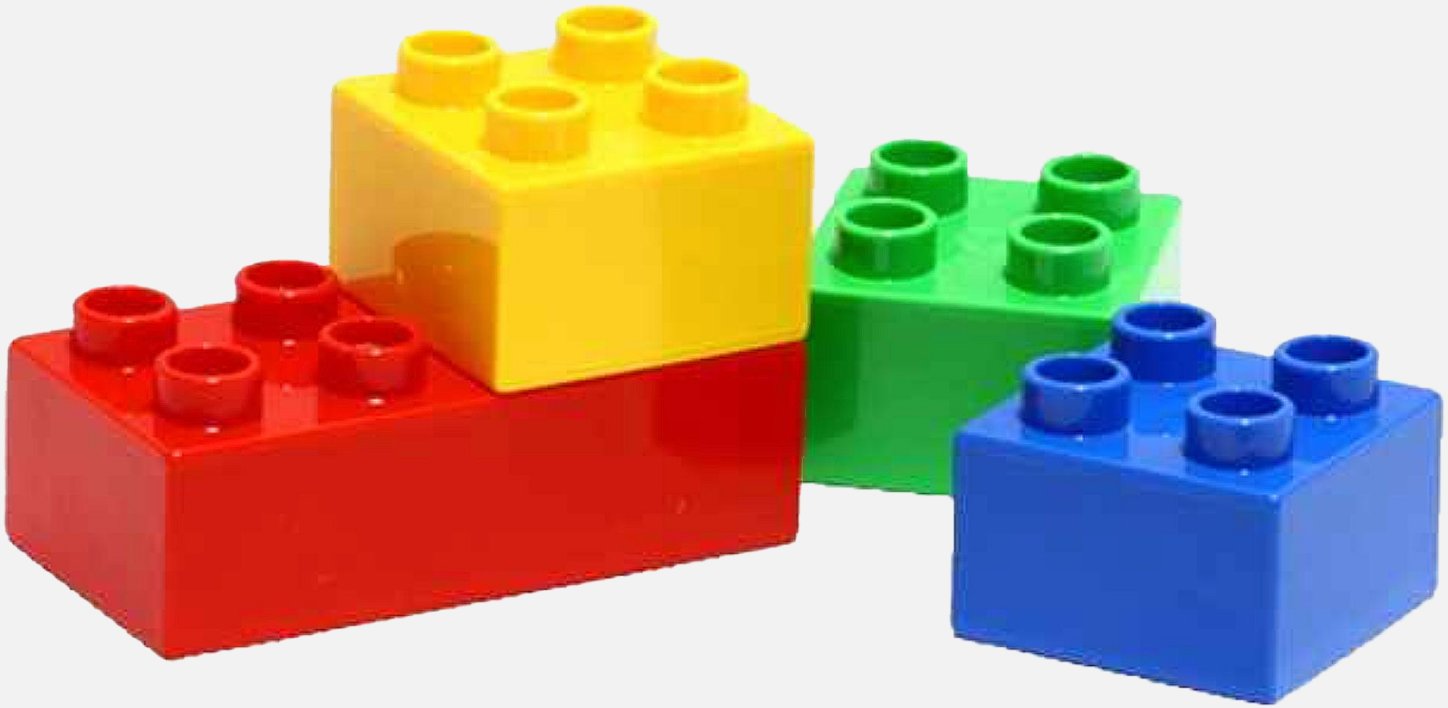
Adapted from Figure 4. Mora, C., McKenzie, T., Gaw, I.M. et al. Over half of known human pathogenic diseases can be aggravated by climate change. Nat. Clim. Chang. (2022). https://doi.org/10.1038/s41558-022-01426-1

Classroom temperature

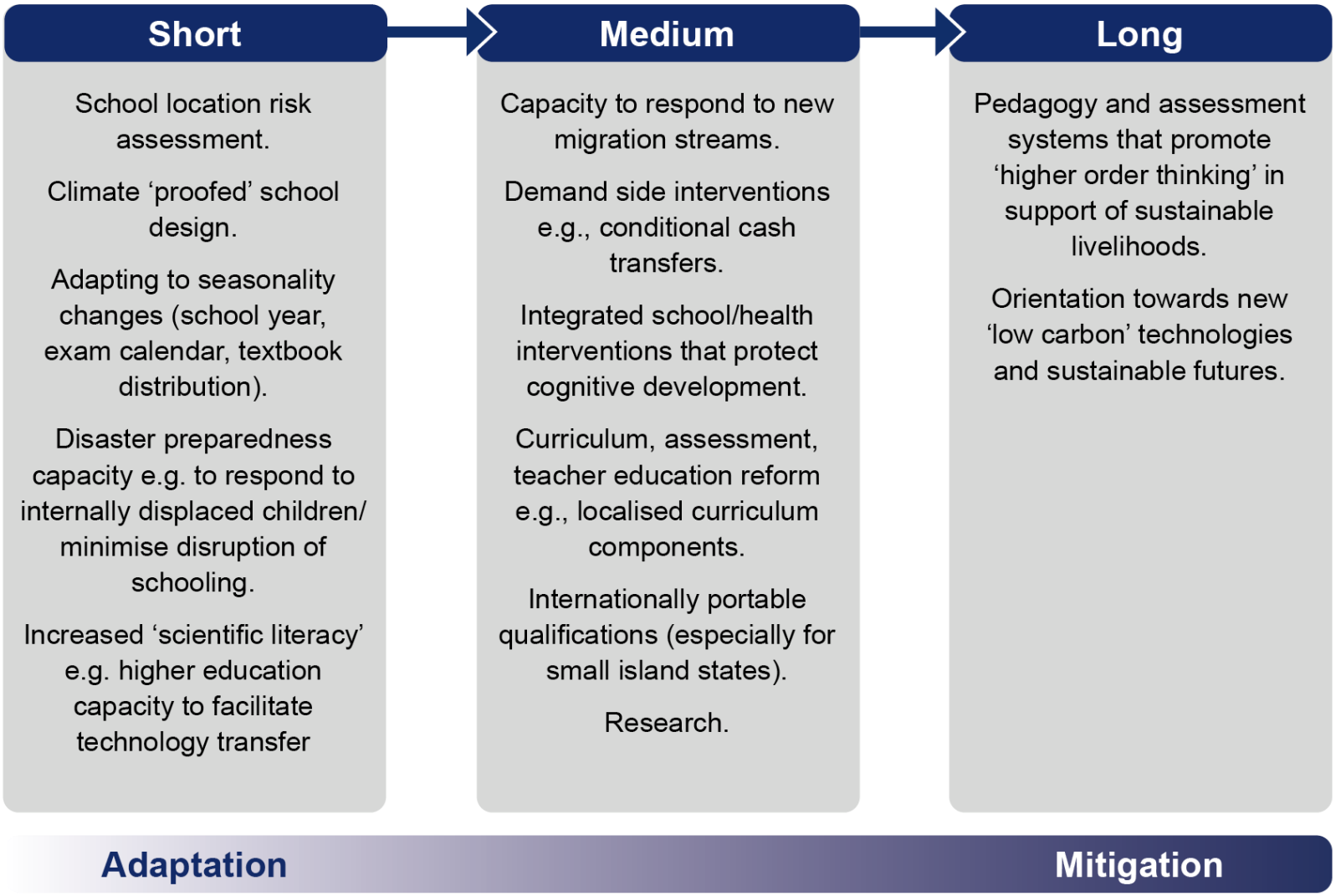
However good the curriculum, teacher, textbooks or ICT, if children and teachers are too hot, thirsty, hungry, the learning will suffer.



Building blocks (for a sustainable future)



Think time: over years and within years (seasonality)



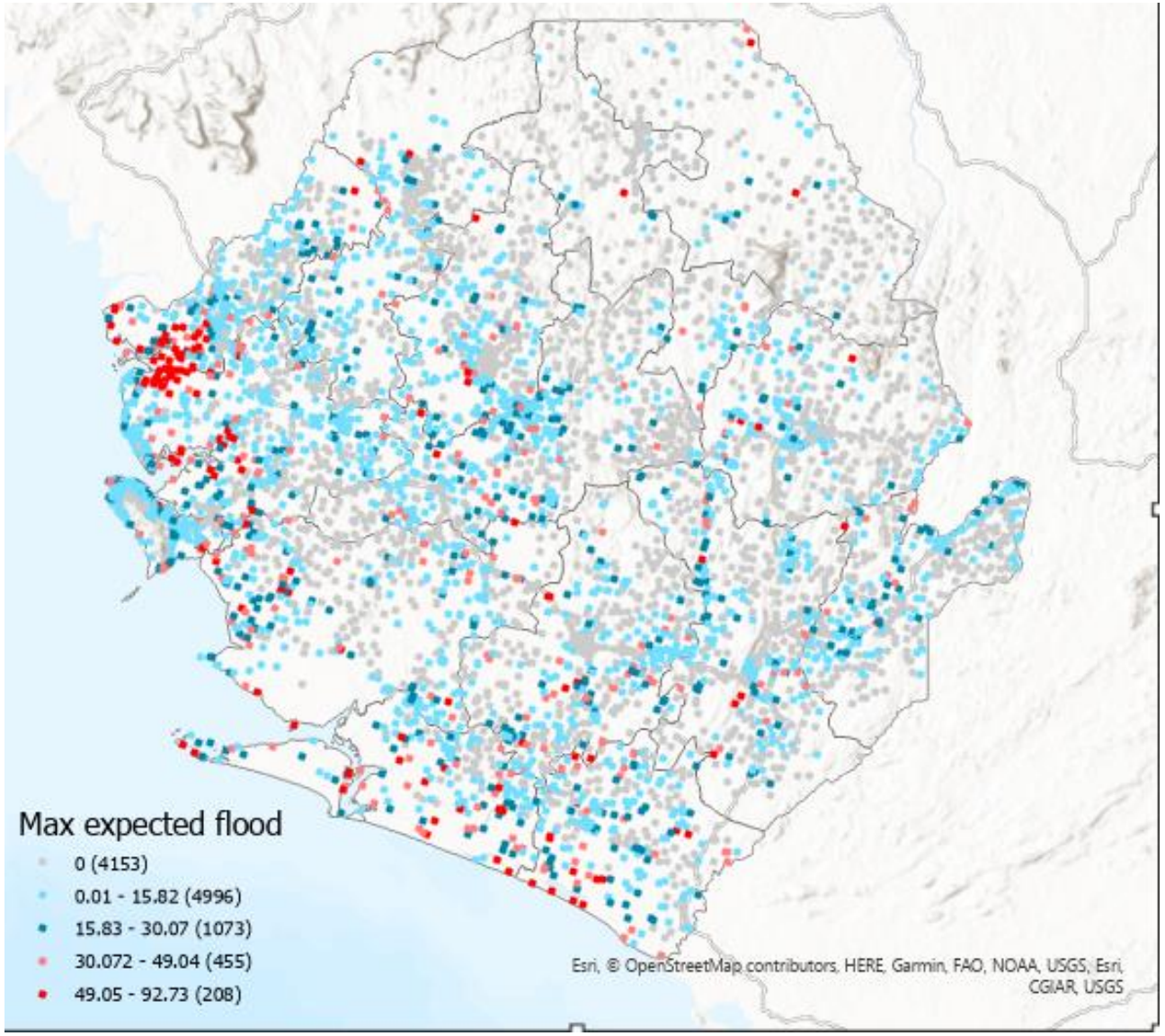
[Bangay: 2022: Framing the Challenge]

Think geography

Not all parts of the country face the same risks.

Geographic information systems can:
1) help identify schools most at risk of flooding.
2) identify areas where drought, falling water tables or groundwater contamination make rainwater harvesting sensible for schools.

This information can be used for anticipatory action/pre-position support/parametric insurance.



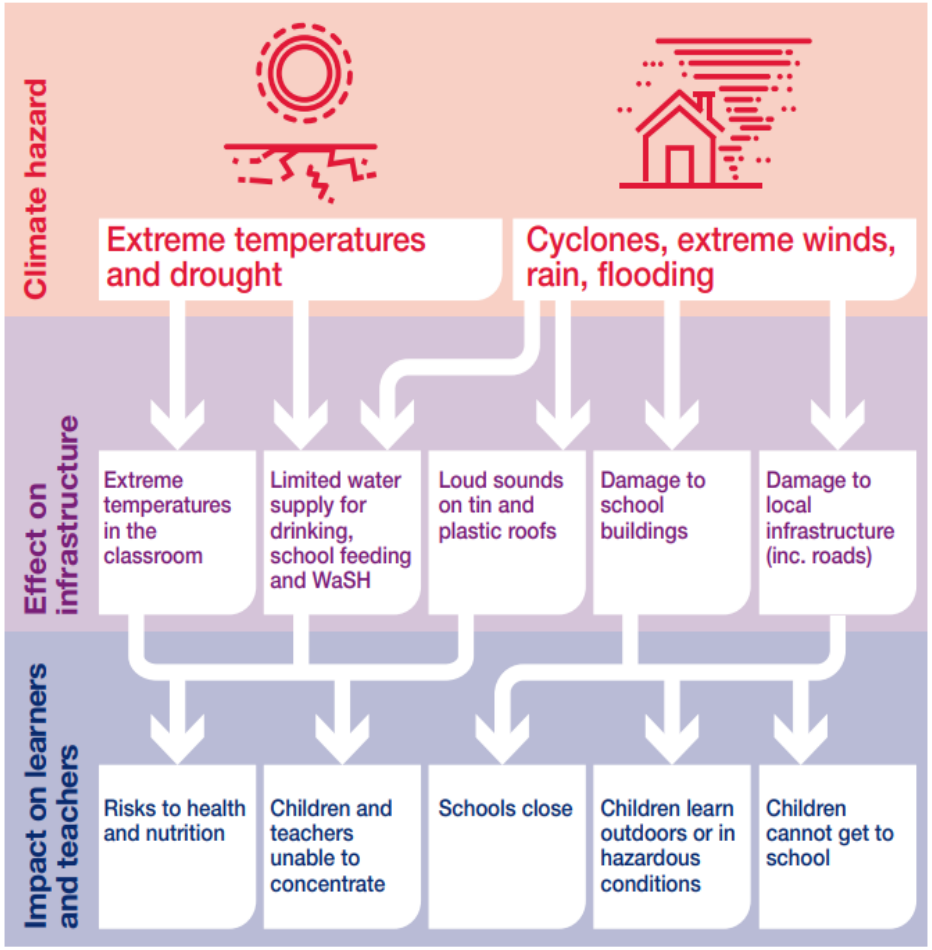
Think infrastructure

- Buildings can be retrofitted to improve learning environments in terms of heat, acoustics and light.
- New buildings (and WASH facilities) need to be orientated and designed with future climates in mind.

LOTS OF SNAKES BUT WHERE ARE THE LADDERS? BUILDING ENVIRONMENT-SMART LEARNING FRIENDLY SCHOOLS RESPONSIVE TO EXTREME WEATHER

Design principles and 5 factors to consider for building climate-resilient school infrastructures.

December 11, 2023 by Colin Bangay, Foreign Commonwealth and Development Office
4 comments
5 minutes read



FCDO funded research in Tanzania

Think (differently) about learning

"If all education is about the future, then the future needs to be a more explicit concern at all levels of education." - David Hicks

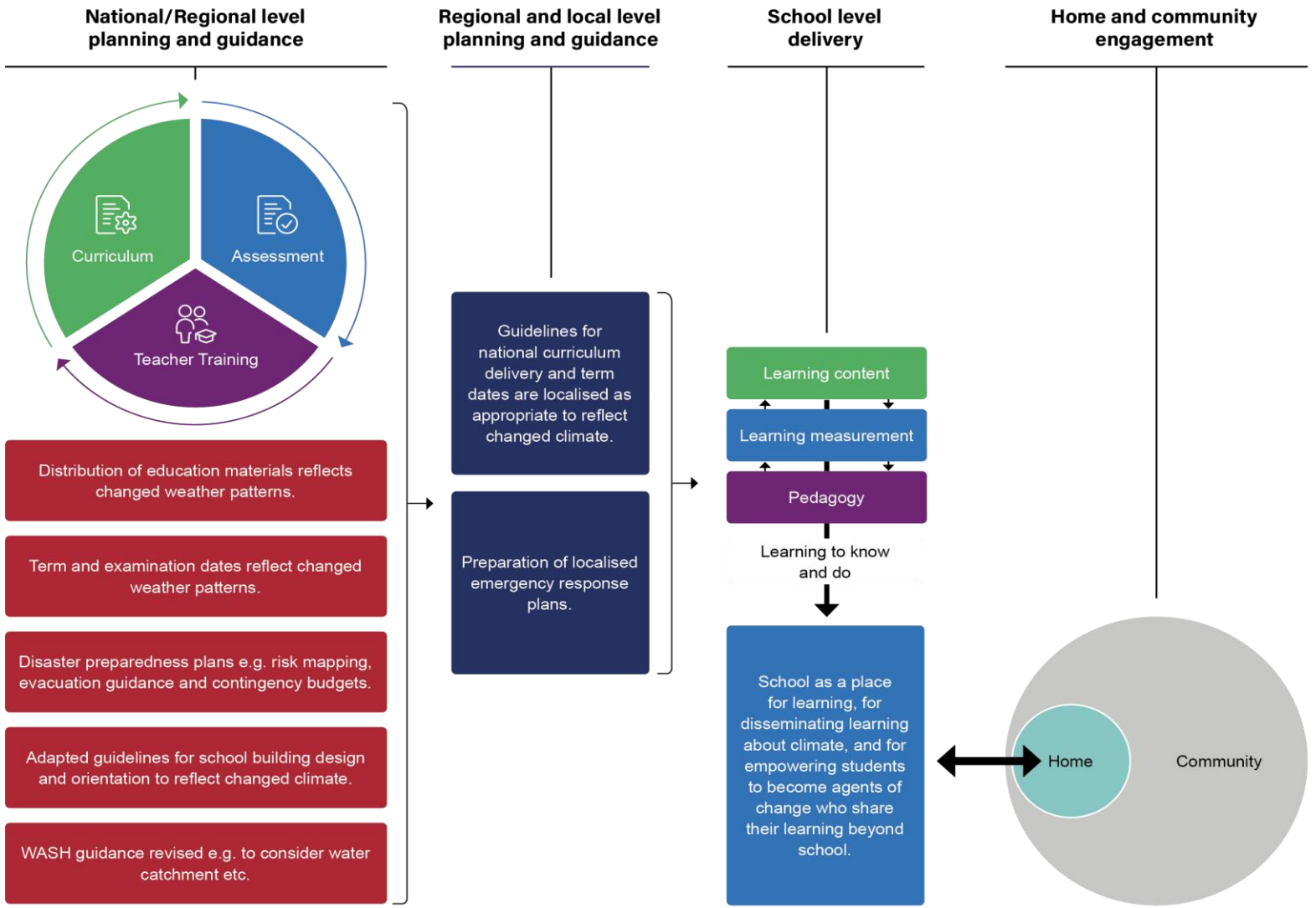
- **Factual knowledge is not enough –** we need more than learning to know; education must deliver **learning to do**.
- **Changing the curriculum is not enough –** we have to change assessment systems and teacher pedagogy; we must move beyond factual recall to higher levels of attainment problem-framing and –solving, and individual and collective agency.
- **Not all learning happens in schools –** extra-curricular activities and work with the community is often more productive for climate/environmental action.

Think systems

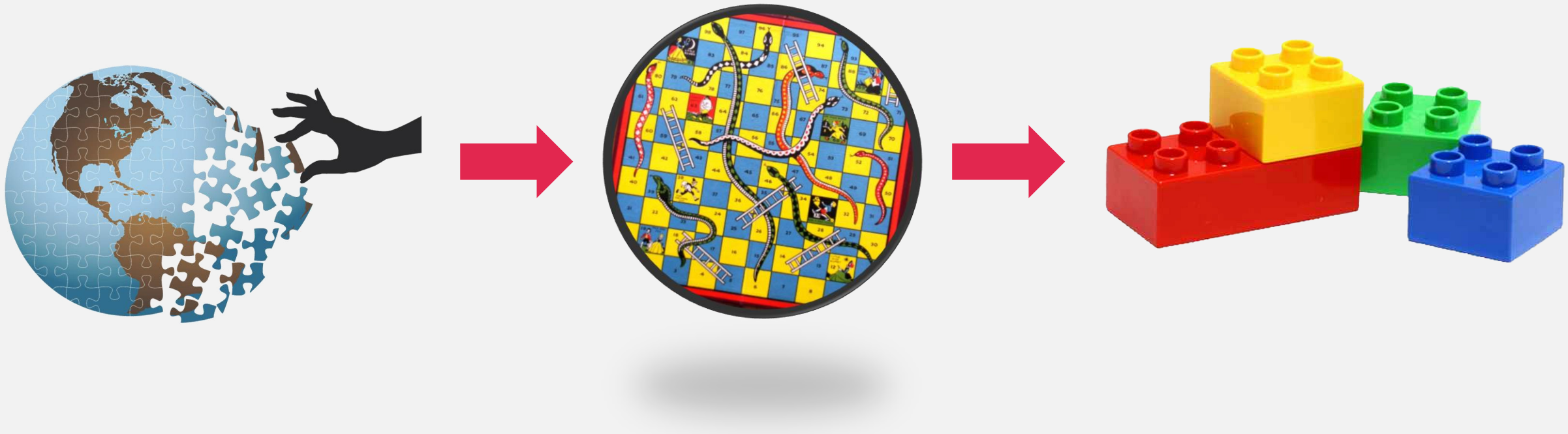
An education system is a delivery chain from ministry to classroom.

It is only as strong as its weakest link.

Climate and environmental change will test these links.



Conclusion: see the big picture, know your risks, plan and respond



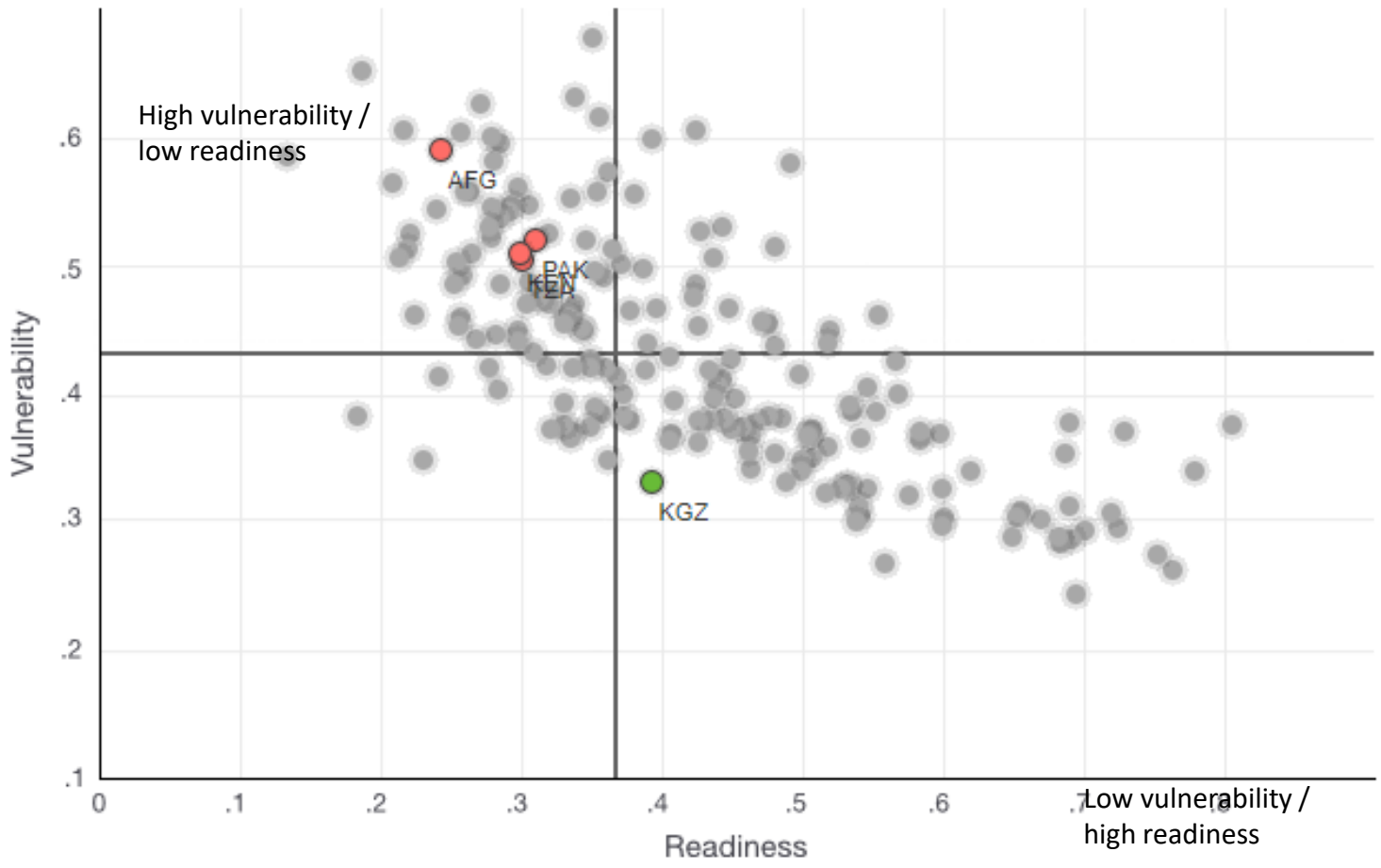
Schools2030 Geographies risk and readiness profile

Country	Vulnerability	Readiness
Afghanistan	12	180
Kenya	41	152
Krygyzstan	158	100
Pakistan	35	146
Tanzania	45	151

Out of 185 countries

Vulnerability: Food, Water, Health, Ecosystem services, Human habitat, Infrastructure

Readiness: Economic, Governance, Innovation



[Rankings // Notre Dame Global Adaptation Initiative // University of Notre Dame (nd.edu)]

Find out and **fill in** for your country

Table 1: National / Regional Climate Assessment

Vulnerability	Societal Implications	Geographic Specificity (national / local)	Education Issues and Responses
Food security	*What is predicted to happen to crop yields over what time?*		• Poor nutrition / health impacts on learning • School feeding • Conditional cash transfers
Energy security	*What is predicted to happen to energy production and use over what time?*		• Unreliable electricity – prevents /disrupts IT use • Solar / wind /HEP generation (micro or mini grids)
Flooding	*What is predicted to happen to rainfall amounts, timing, intensity?*		• School flooding • Routes to schools become impassable • Schools used for emergency shelters • Water contamination • Geographic Information Systems (GIS) risk mapping to identify at risk schools and routes to schools and identify best locations for new schools • Adaptation of vulnerable school buildings and compounds. • New more resilient school building designs • School contingency plans for flooding

Table 2: Useful sources of information on Climate and Environment Issues by Country

Source	Description	Weblink
The World Bank Climate Risk Country Profiles:		
World Bank Country Climate and Development Reports (CCDRs)	Country profiles of selected countries with detail of present and projected risks	Climate Risk Country Profiles | Climate Change Knowledge Portal (worldbank.org)
USAID Climate and Environment Fact Sheets	Regional and Individual country overviews	Country Climate and Development Reports (CCDRs) (worldbank.org)
Asian Development Bank Climate Risk Country Profiles	Short country led climate and environment overviews	Search | U.S. Agency for International Development (usaid.gov)
ND Gain Country Index	Individual country summarise of of climate characteristics and projections, vulnerability to natural hazards	Search by country e.g. Climate Risk Country Profile: Afghanistan | Asian Development Bank (adb.org)
Nationally Determined Contributions (NDC) Partnership	The ND-GAIN Country Index summarizes a country's vulnerability to climate / environmental challenges in combination with its readiness to improve resilience.	Country Index // Notre Dame Global Adaptation Initiative // University of Notre Dame
United Nations Framework Convention on Climate Change (UNFCCC) Education and Training: Resources	Overviews of country nationally determined contribution plans. Detailing government plans on mitigation and adaptation.	https://ndcpartnership.org/about/members
UN Climate Change Learning Partnership	Range of online resources for educators	Education and Training: Resources | UNFCCC
Yale Environmental Performance Index	Portal of online learning courses	Knowledge Sharing Platform (unccLearn.org)
UNEP World Environmental Situation Report	EPI ranks 180 countries on climate change performance, environmental health, and ecosystem vitality.	Welcome | Environmental Performance Index (yale.edu)
the Met Office Climate risk reports:	Data archive or climate environment issues searchable by country, region, topic etc	Main page | WESR (unep.org)
	Regional Risk Reports for MENA and Africa	Climate risk reports - Met Office

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