The Economics of Disaster Risk Reduction

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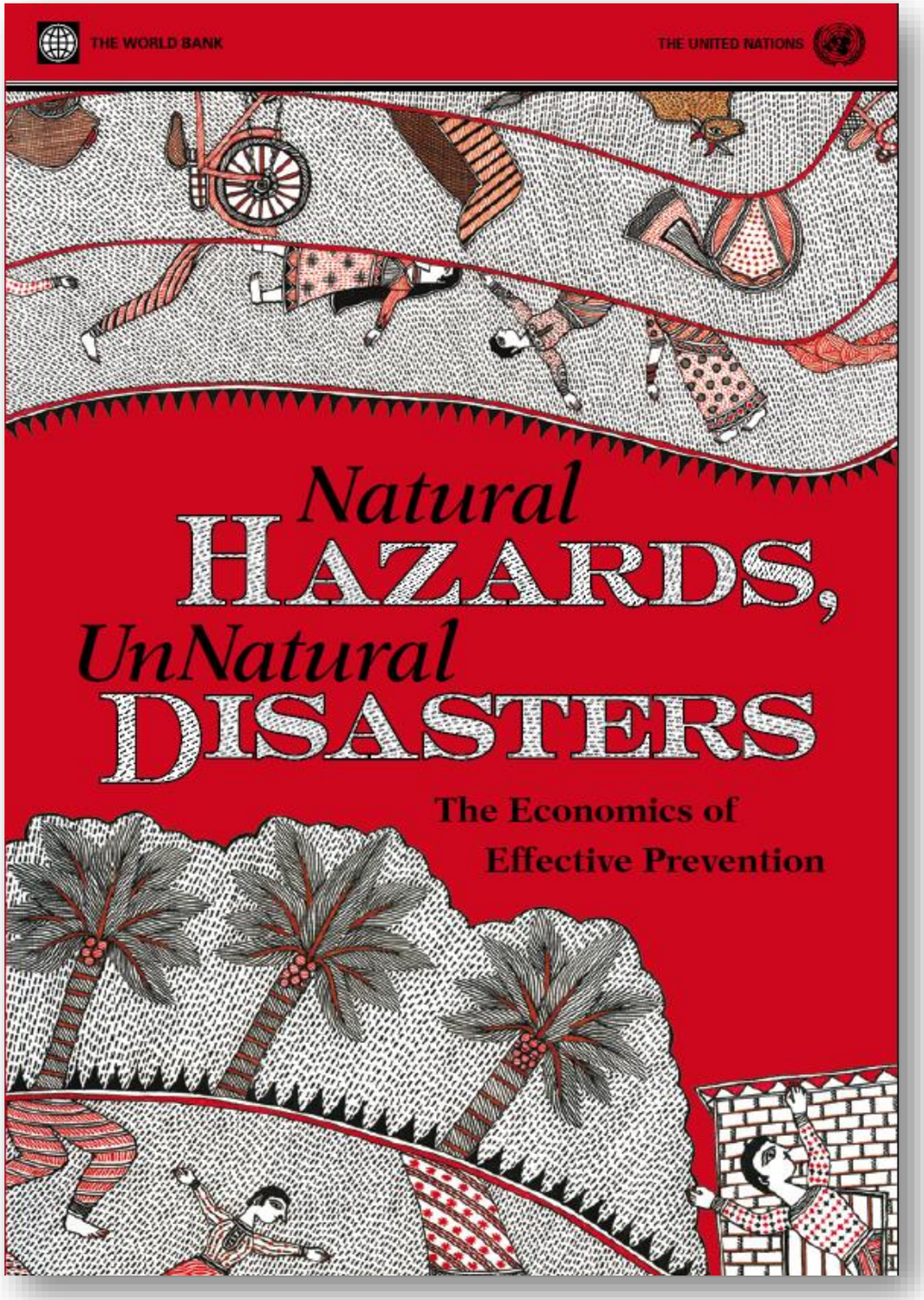
www.worldbank.org/preventingdisasters



GFDRR
Global Facility for Disaster Reduction and Recovery

International Strategy
for Disaster Reduction

Water scarcity and water use efficiency in South Asia

Low Water - High Growth
in South Asian Economies

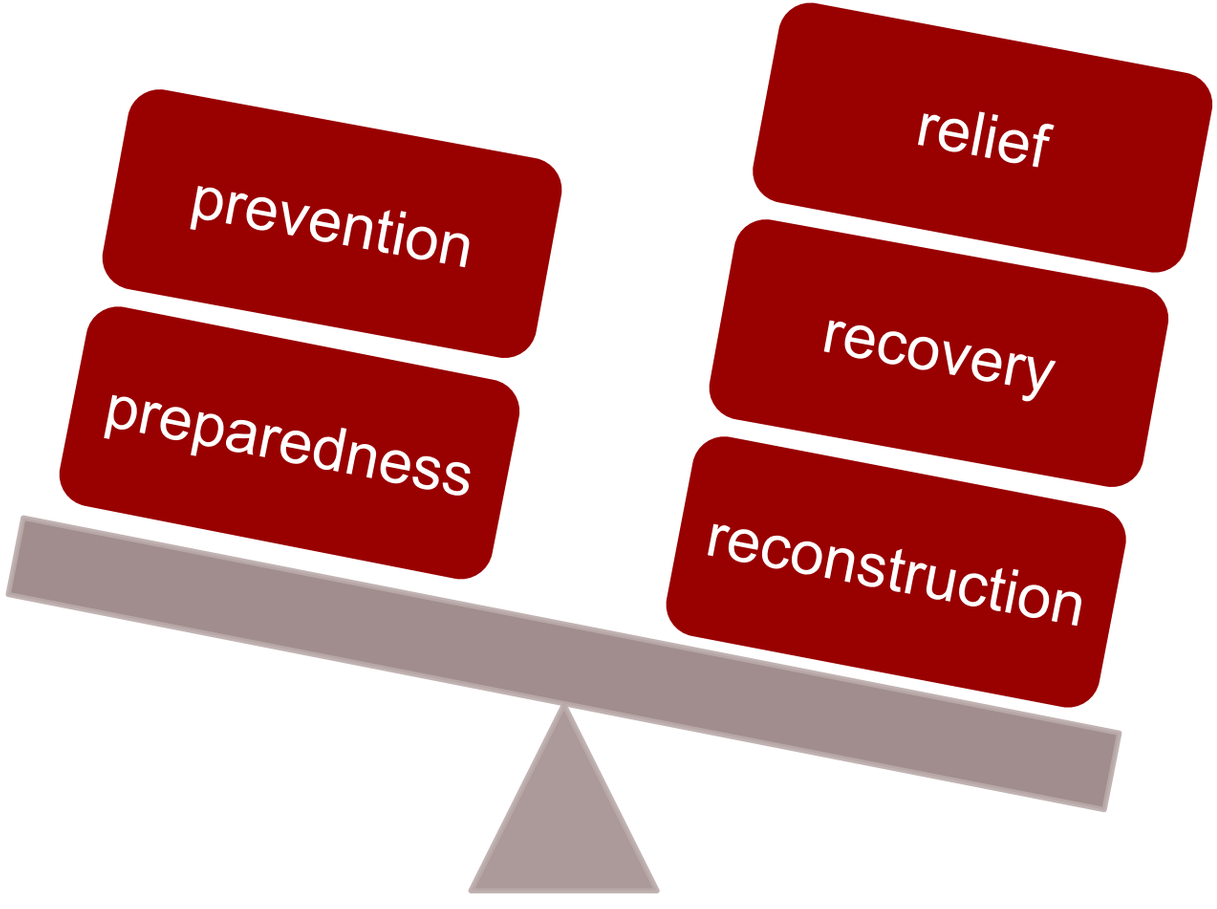
World Bank (2017) - GTAP & IGES

AUSAID – World Bank and ESMAP

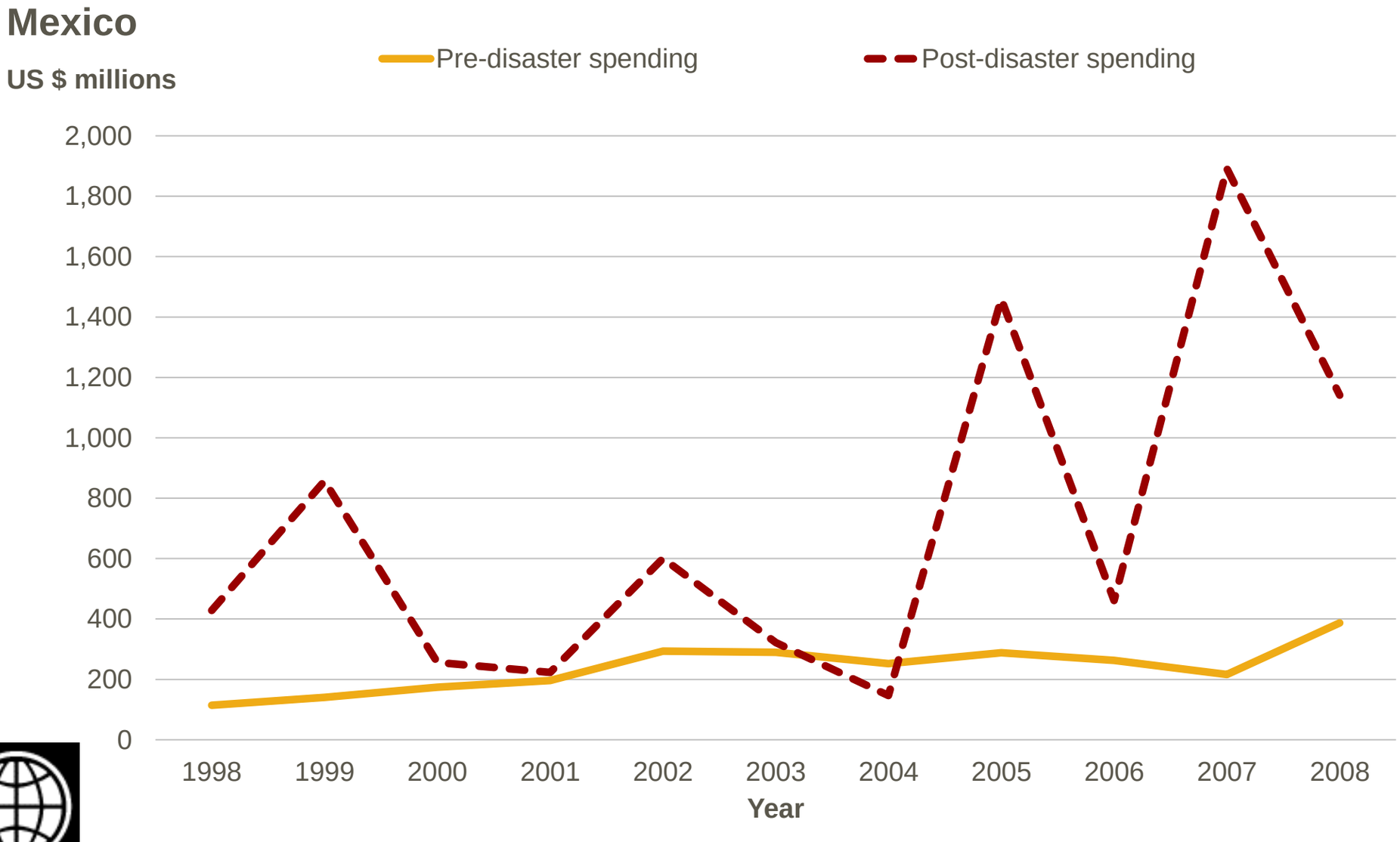
hazards
prevention
institutions

Ps

Rs


prevention
preparedness
relief
recovery
reconstruction

How much do governments spend on prevention?



Ps

Rs

prevention

preparedness

relief

recovery

reconstruction

1. Avoiding disasters' adverse effects are the benefits of prevention
2. Prevention pays but you don't always have to pay *more* for prevention
3. Targeted increases in spending warranted
4. No single measure is sufficient
5. The future can be managed

Approach

Get the 3Is right:

Information

Incentives

Institutions

Invest in CBA or an integrated assessment framework where an economy-wide modeling with technical information on drought risk, with a sufficient degree of sectoral disaggregation, the analysis would examine:

- overall economic activity and per capita income;
- sectoral output and employment level, all with and without DRR measures

message 1

avoiding disasters' adverse effects are

the benefits of prevention

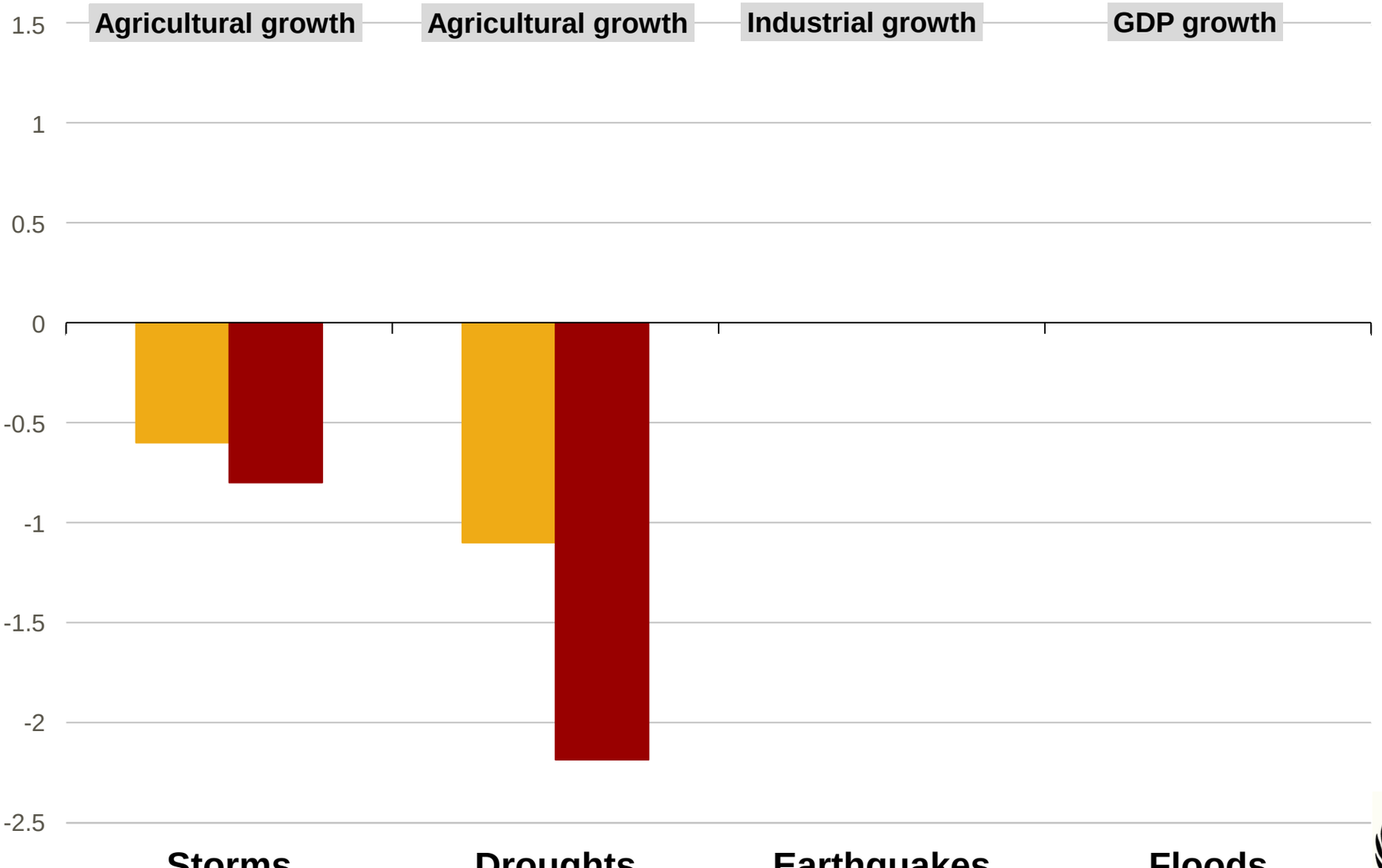
Large disasters raise budget deficit in developing countries between **0.23%** and **1.1%**

large disasters have severe FISCAL effects

“The **budget deficit** before the flood crisis was...**4.5%** of GDP, now [it can be]...as much as **6 to 7%**...”

- Pakistan Prime Minister Gilani

5 year effects on growth (severe disasters)



GDP ≠ WELFARE

Philippines: reading / math scores
0.75 SD lower for stunted children

malnourished children, through stunting, become

less productive adults

- lower body mass
- lower cognitive skills

message 1

avoiding disasters' adverse effects are

the benefits of prevention

message 2

prevention pays, but

you don’t always have to pay *more* for prevention


St Lucia
hurricane
+ 1.5
Jakarta
flood
+ 3.7
Istanbul
earthquake
+ 4.6
India
(Rohini basin)
flood
+ 5.7
high benefit-cost ratios

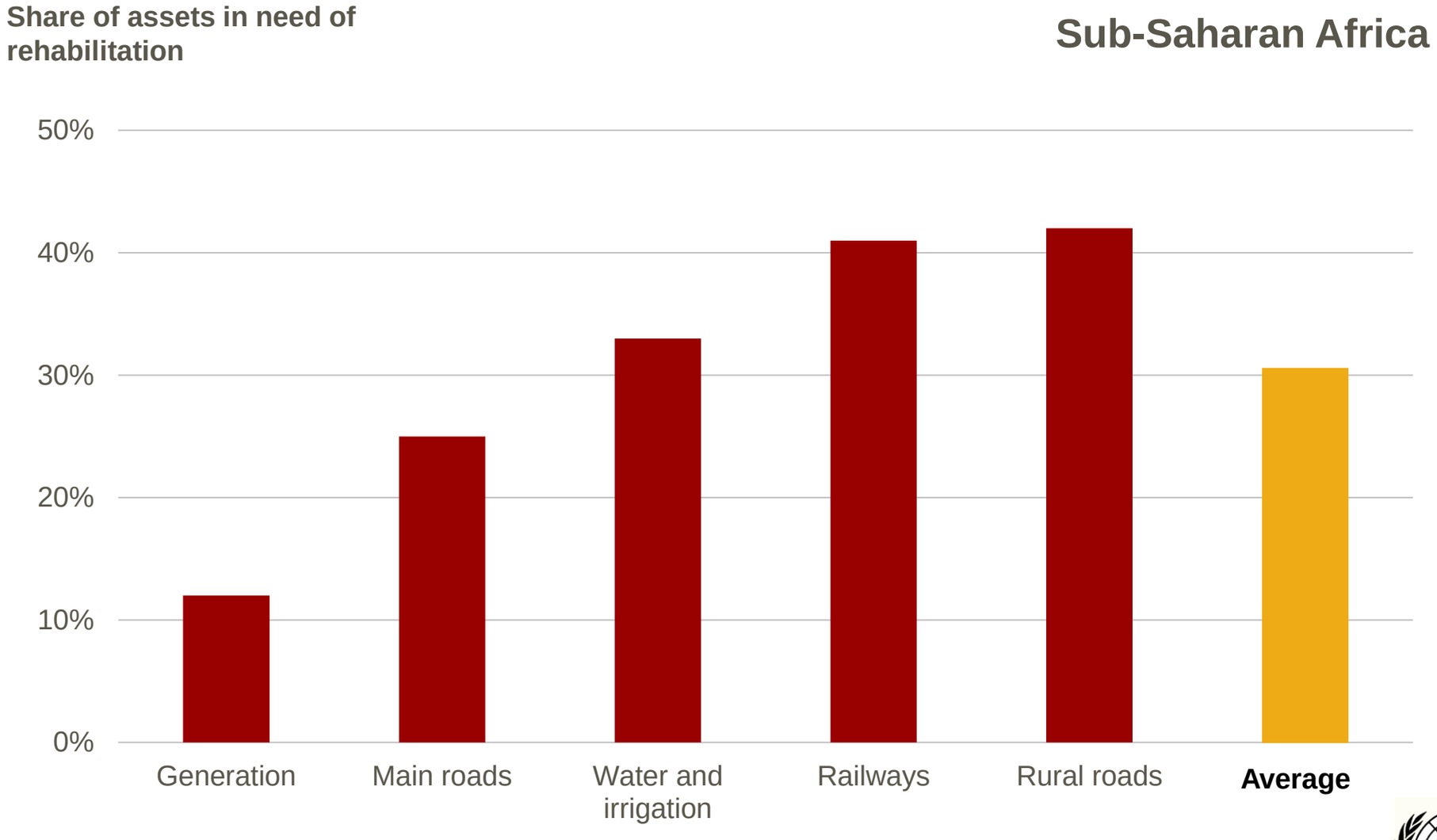
In Peru, land titling associated with **68%** increase in **housing renovation** within 4 years

let MARKETS work

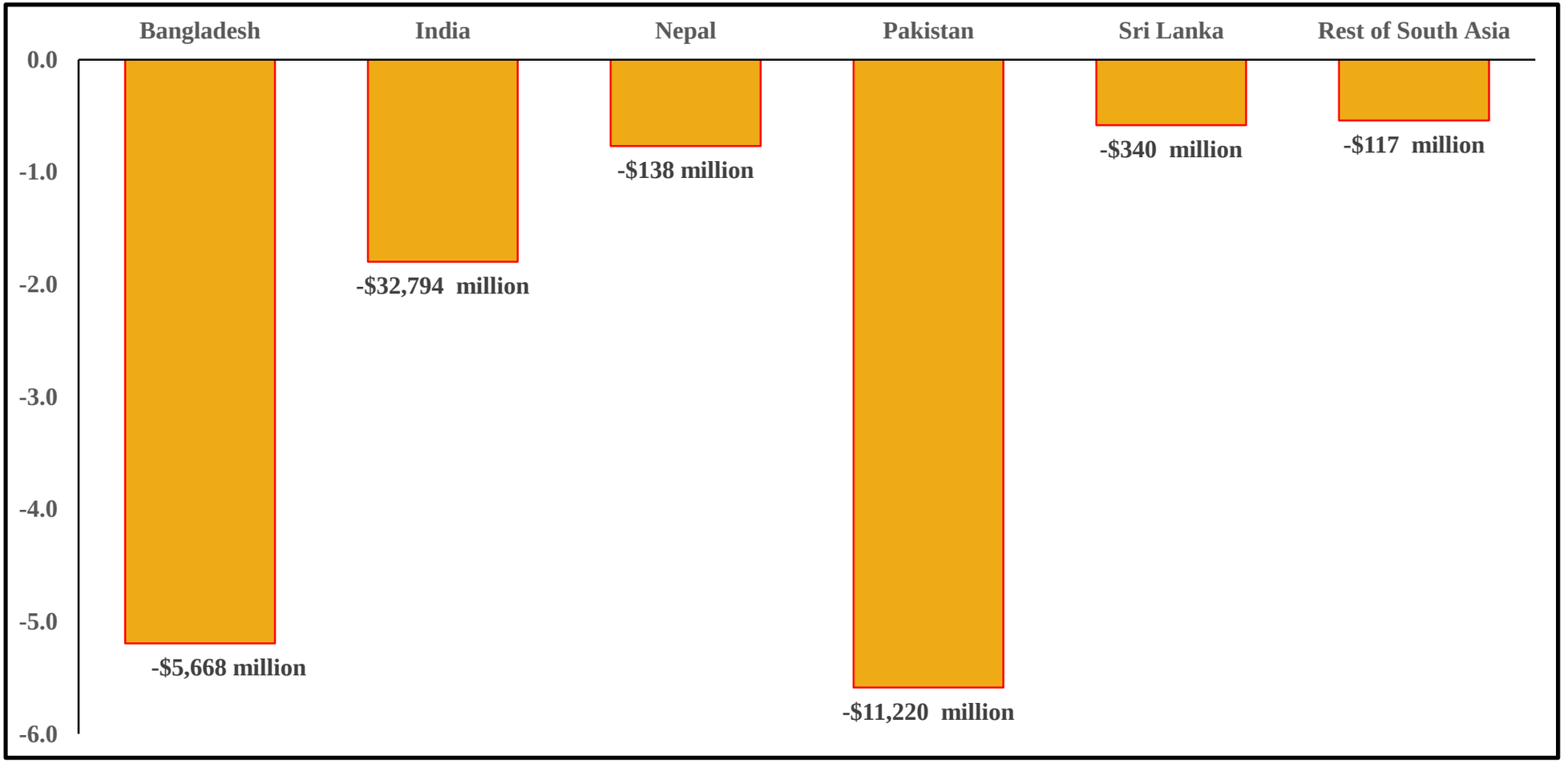
by

- removing distortions
- providing secure title

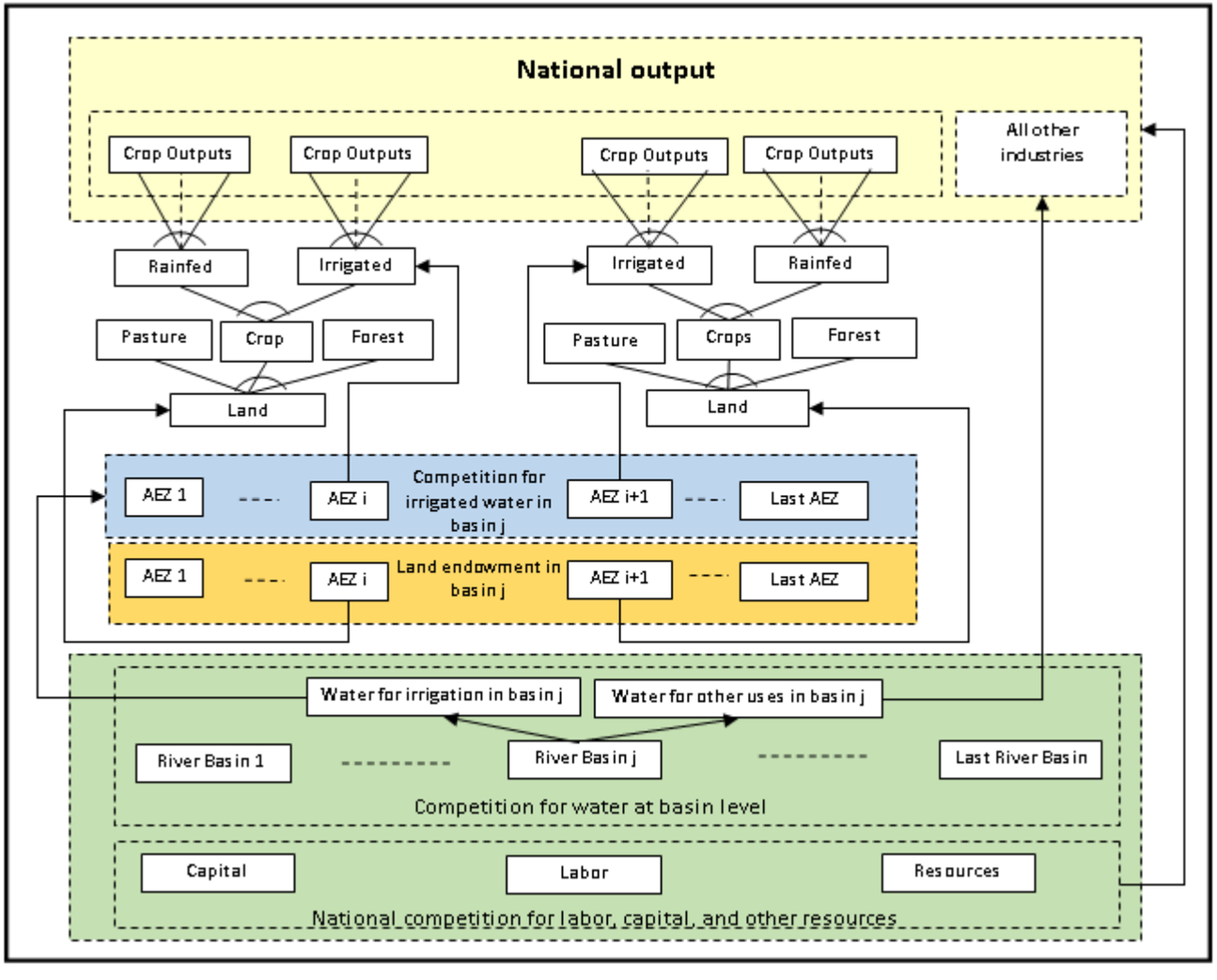
Underspending on maintenance = higher rehab costs



Percent change in GDP due to water scarcity and climate-induced crop yield changes



Integrated framework: Holistic Approach



message 2

prevention pays, but

you don’t always have to pay *more* for prevention

message 3

targeted increases in spending warranted

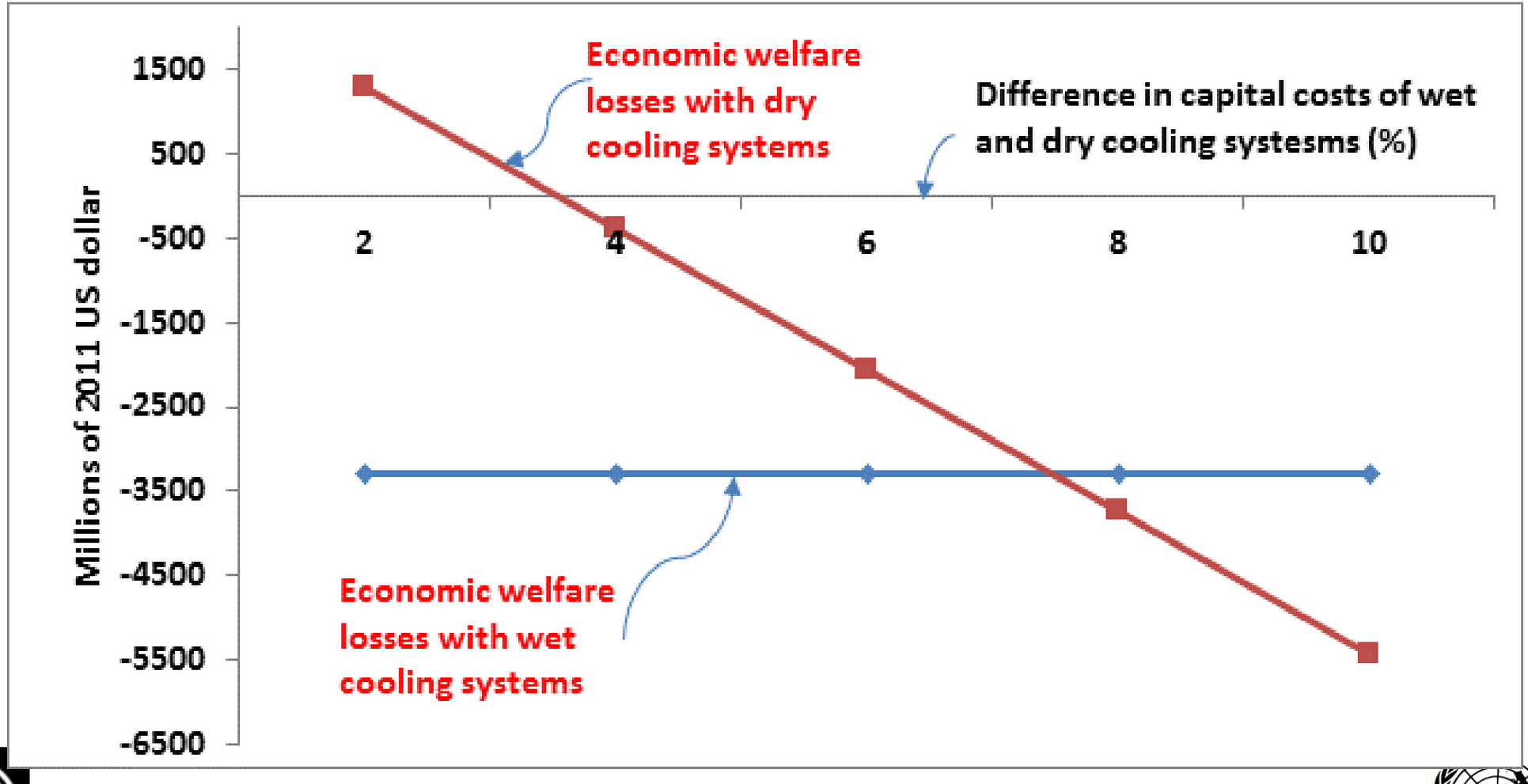
more spending warranted to

promote BETTER WATER USE PRACTICES

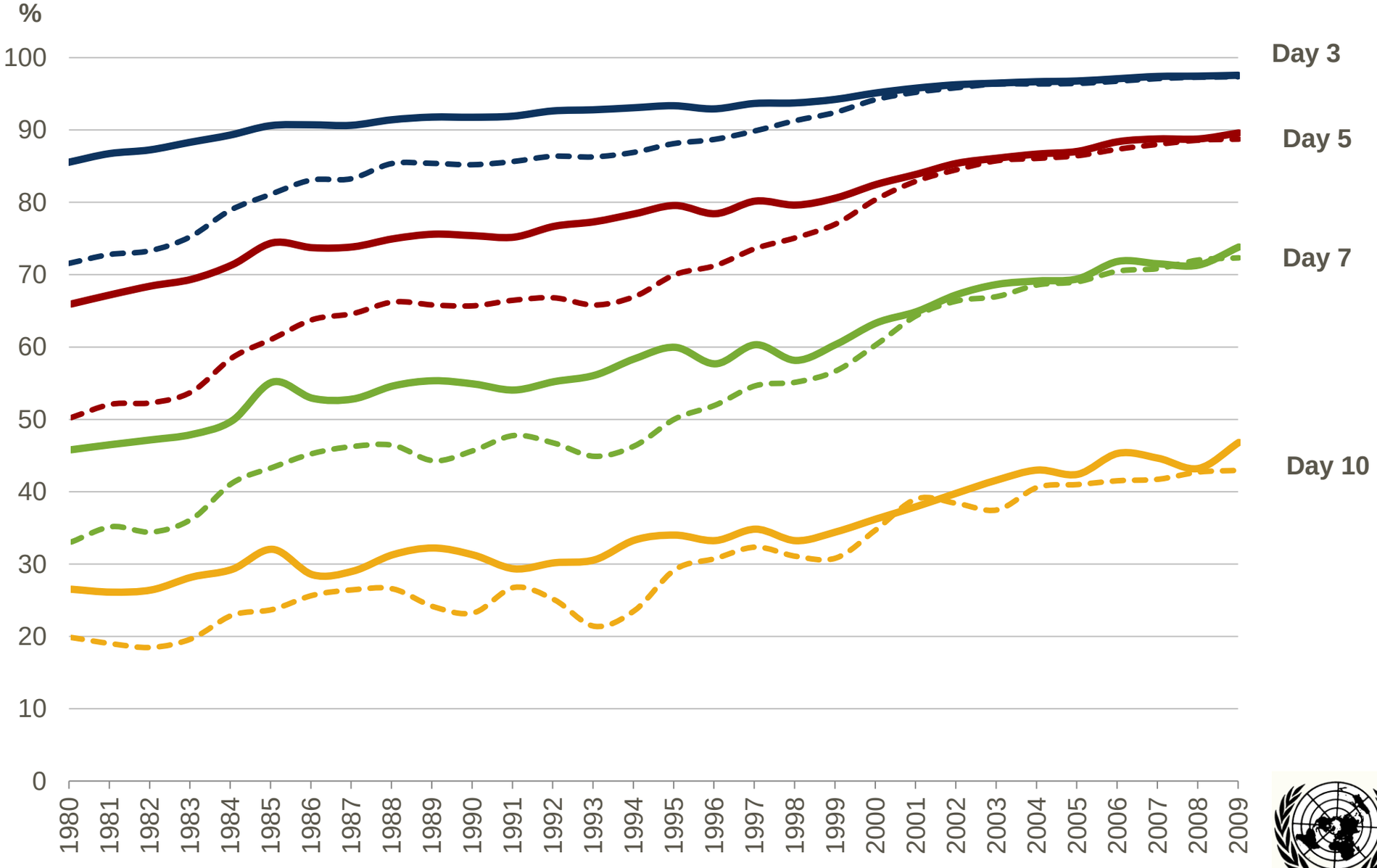
Costs of improvement in water use efficiencies in South Asia

Description	Level of improvement in WUE	Bangladesh	India	Nepal	Pakistan	Sri Lanka	Rest of South Asia
Average costs for each level of improvement in WUE ($/ha)	10%	31	27	33	35	41	35
	20%	74	63	78	83	96	83
	30%	167	142	176	186	216	186
	40%	340	289	358	380	440	380
Capital requirement for each level of improvement in WUE (million $)	10%	212	2000	49	608	36	63
	20%	503	4735	116	1441	86	149
	30%	1132	10667	260	3245	193	336
	40%	2307	21736	531	6612	393	685

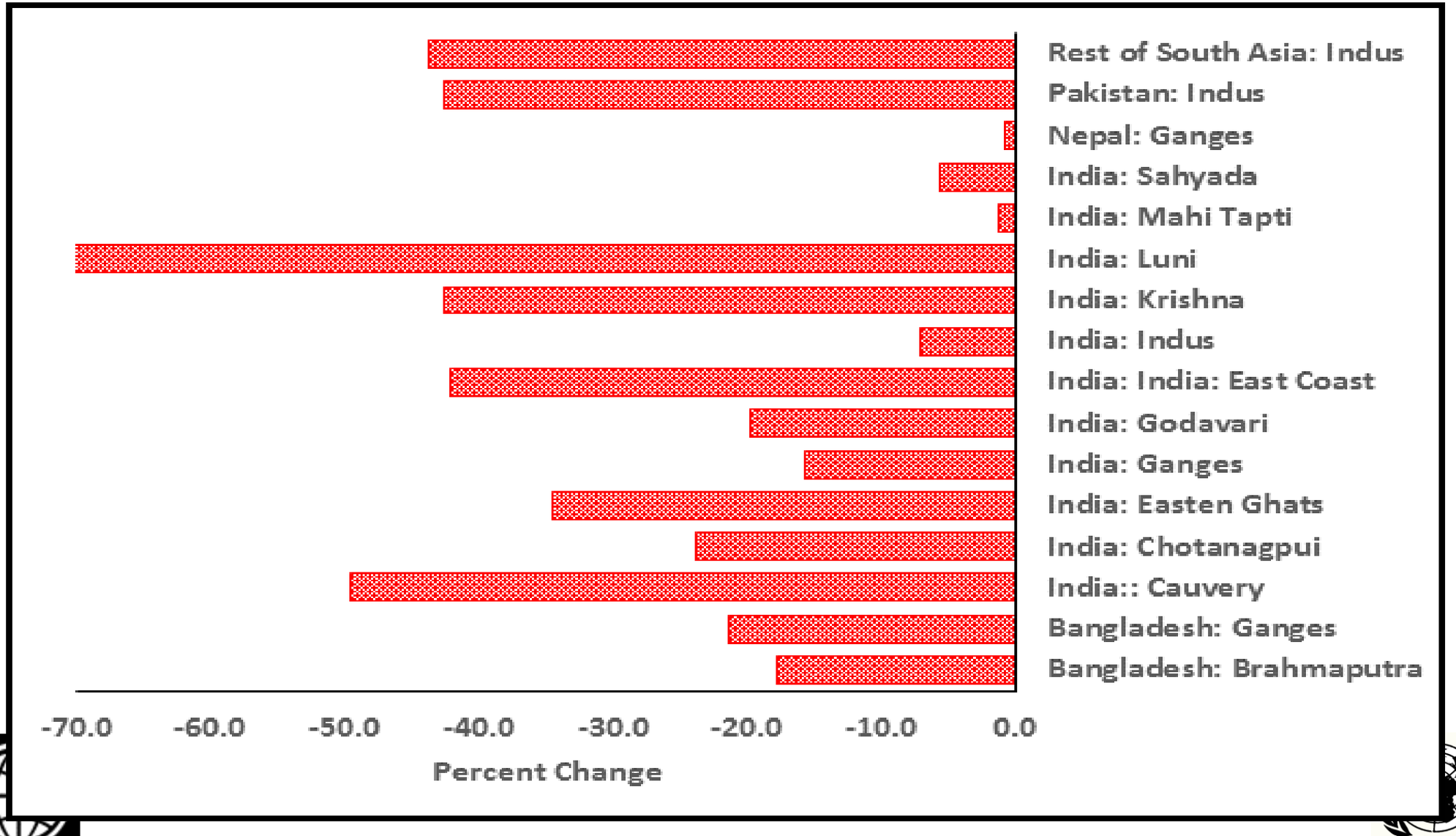
Breakeven capital cost differential between the wet and dry cooling technologies



Increasing accuracy of weather forecasts



Projected percent changes in irrigation water supply in South Asia by river basin in 2011-50



message 3

targeted increases in spending warranted

message 4

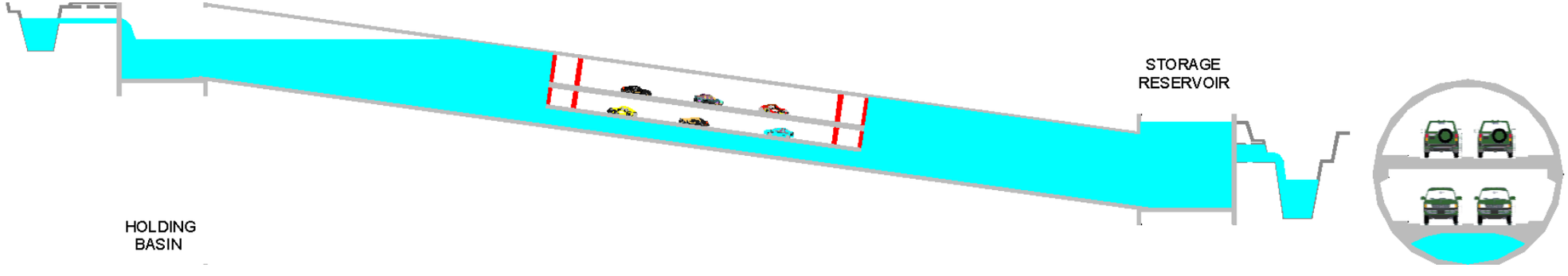
no single measure is sufficient

USA: list includes **13 sectors** (up from 8 in 1995) & **1700 critical assets**.

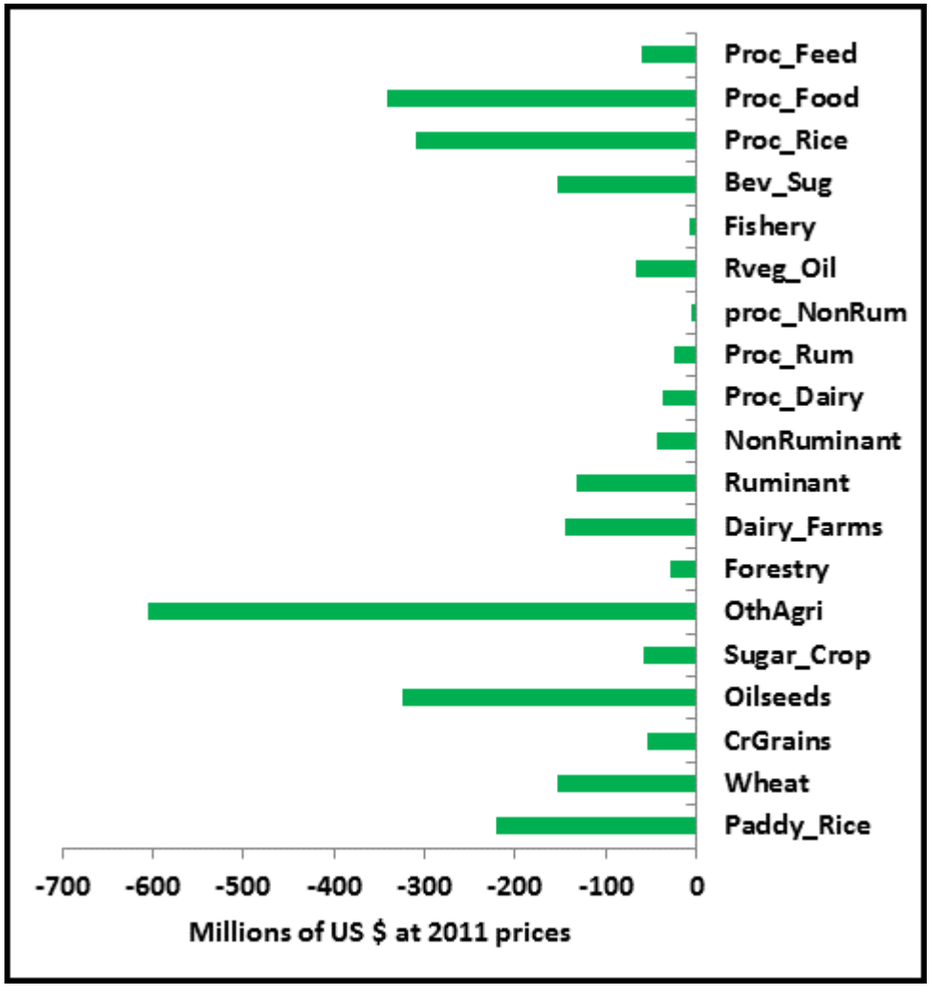
if everything is critical, then nothing is:

keep the list short

Kuala Lumpur’s SMART tunnel, an example of critical infrastructure tailored to a specific hazard



Reductions in food products in 2050 compared to the baseline due to expansion in water demand for cooling power plants

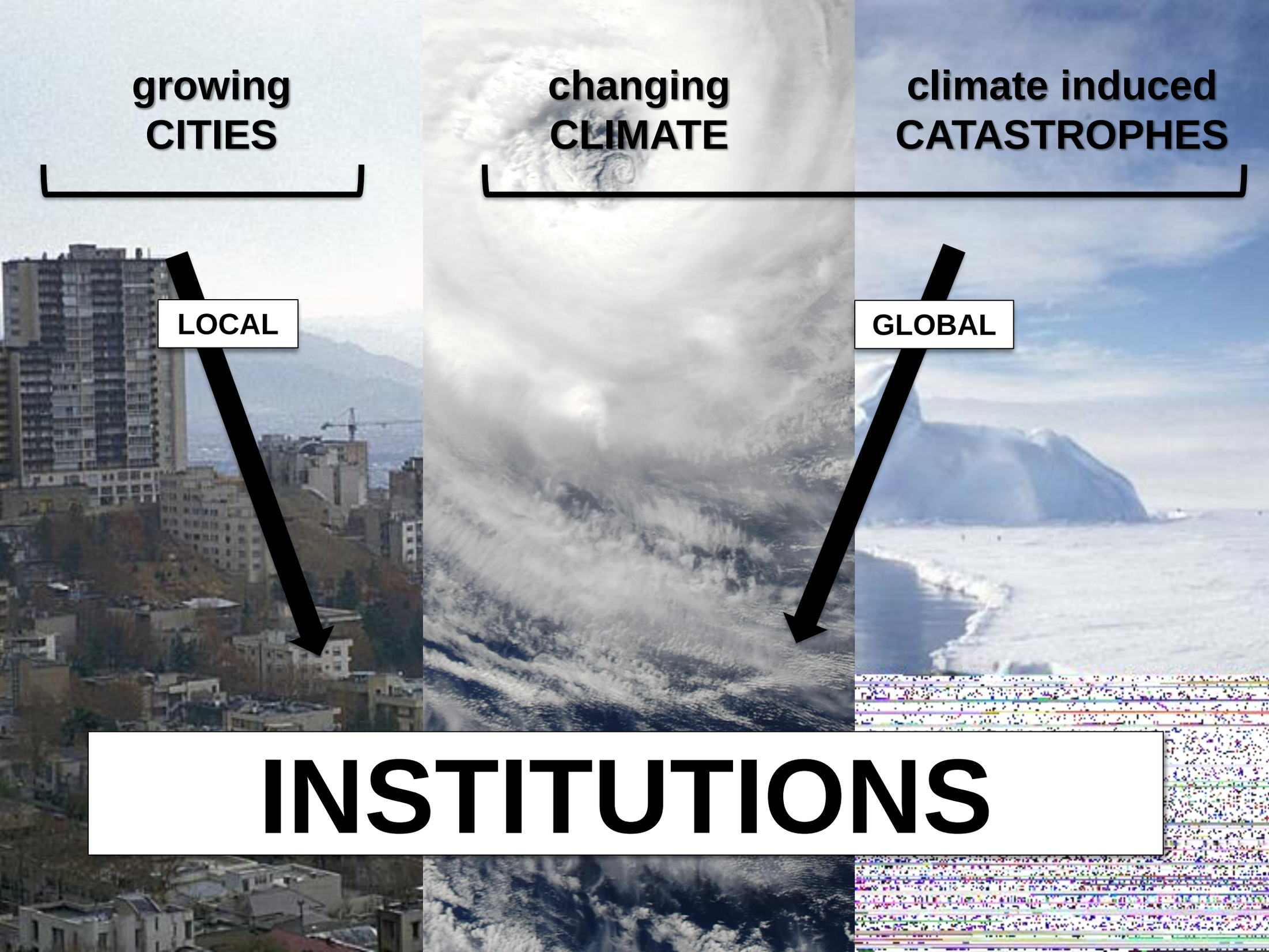


message 4

no single measure is sufficient

message 5

the future can be managed


growing
CITIES
changing
CLIMATE
climate induced
CATASTROPHES
LOCAL
GLOBAL
INSTITUTIONS

Menu of measures: Co-benefits

Policy simulation example

The electricity subsidies paid in Bangladesh, India, Pakistan, and Sri-Lanka were about 2.63%, 0.32%, 1.31%, and 0.47% of their GDP in 2011 (Clements et al., 2013). Among all electricity users, agricultural usually pays the lowest tariff rates and receives the highest subsidy rates in South Asia.

Savings from electricity subsidy removal earmarked to WUE improvement.

WUE improvement – Public Finances

Cost assumption	If improvement in water use efficiency is costless				Improvement in water use efficiency needs additional investment costs			
Rate of Improvement in WUE	10%	20%	30%	40%	10%	20%	30%	40%
Bangladesh	1216	1098	986	878	1146	1013	835	615
India	8696	7335	6275	5409	8175	6646	4873	2845
Nepal	34	24	17	11	29	17	-2	-27
Pakistan	1160	910	725	562	986	665	187	-447
Sri Lanka	146	101	75	58	138	91	51	14
Rest of South Asia	100	74	53	34	90	60	22	-24

An improvement in WUE up to 40% can be economically justified in Bangladesh, India, and Sri Lanka. In Nepal, after 20% improvement in WUE, the economic gains are smaller than costs. In Pakistan and rest of South Asia, an improvement in WUE over 30% may not be economically profitable.

message 5

the future can be managed

THANK YOU!!!

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