Opportunities and limits to water pollution regulations

1. Opportunities and limits to command and control approaches to water pollution management

2. Water regulation under scientific uncertainty (14:00-15:30)

3. A Holistic view to pollution management from source-to-sea (16:00-17:30)

Oral/poster/panel discussion and participation (survey + bus stop)

International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

science for global insight

Not so much the water as what's in it!

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In collaboration with:

Bruce Beck, Imperial College,

Michael Thomson and JoAnne Bayer- IIASA and

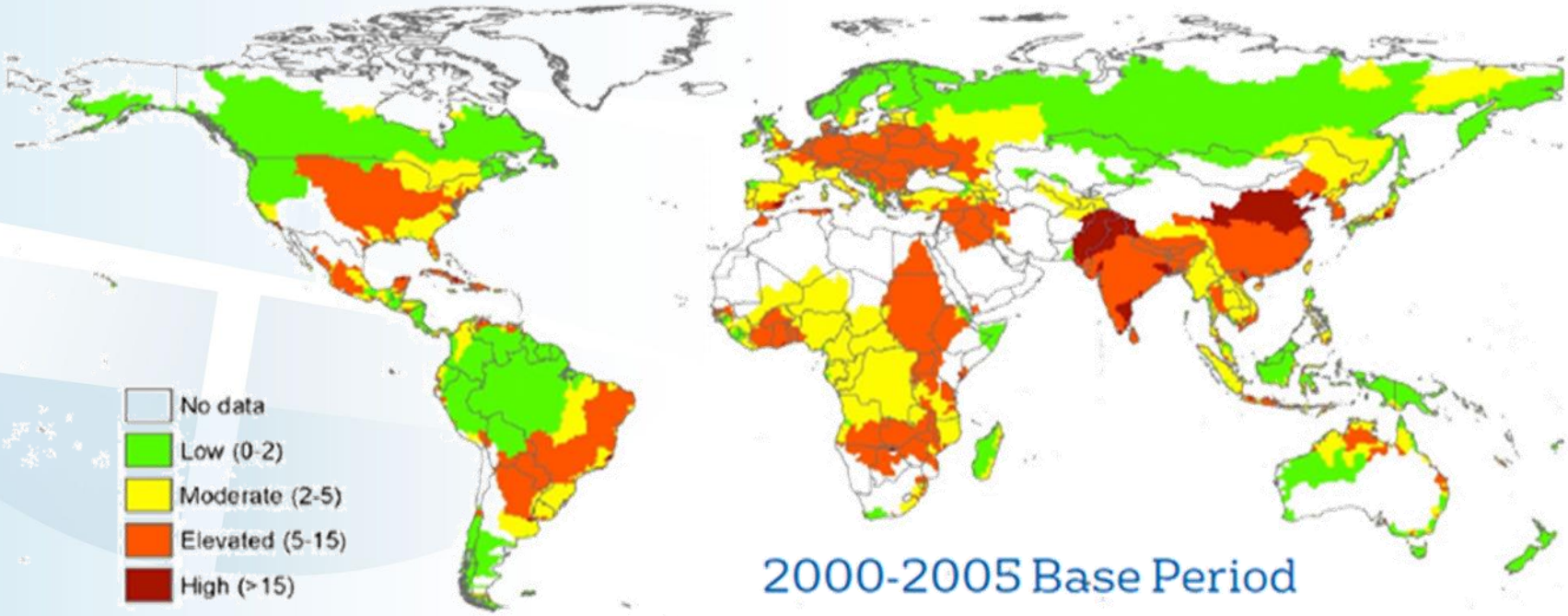
Dipak Gyawali- Nepal Academy of Science and Technology

27th August 2017, Stockholm World Water Week

Background

- Associated with societal development has been the proliferation of under-utilization/mis-use of finite resources
- Consequently society has generated multiple waste streams
- Historically solution has been to not tackle the issue of resource use but to control and regulate largely through imposition of fines and penalties as pollution management

Scale of the problem: Water quality risk associated with nitrogen pollution

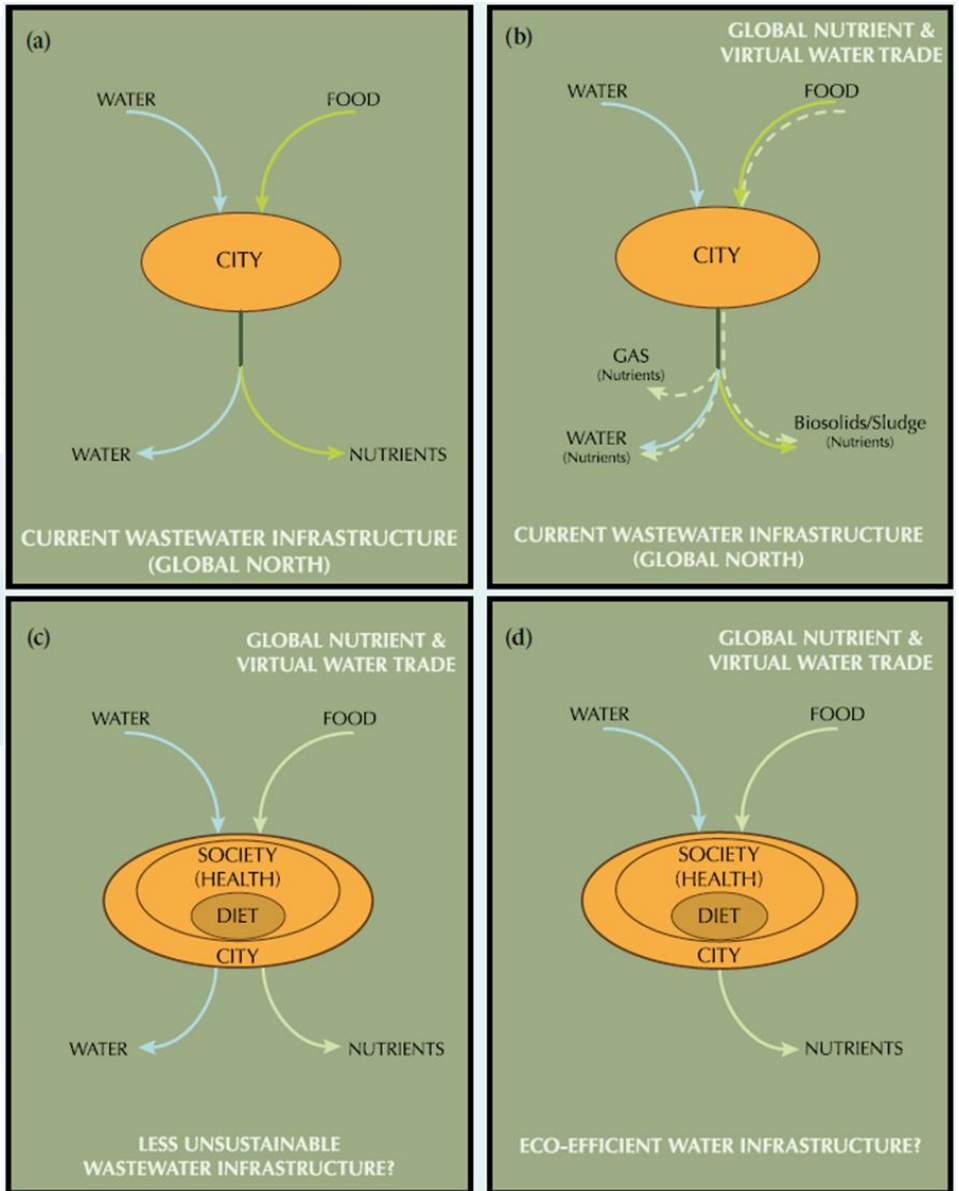


IFPRI & VEOLIA, The murky future of global water quality: A new global study projects rapid deterioration in water quality, International Food Policy Research Institute (IFPRI), 2015.

Future

- Population grows 7 to 9 billion
- Development continues, with economic development largely driven by Asia
- Change from current situation with just over 54% living in urban environments to >65% by 2050. Current 10 megacities to 40 in 2030.

Example of a systems view



Solutions are not in command and control BUT recognizing benefits

Change paradigm of pollution to resource re-use and recovery, through:

a) Reducing excessive and mis-use of finite resources
b) Technical re-use options
c) Understanding costs and benefits
d) Considering wider benefits- ecosystem services
e) All supported by better governance

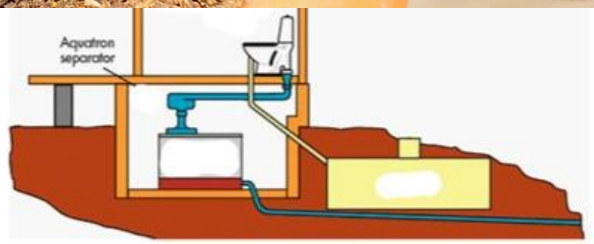
Technical examples

Urine-Diverting, Flush Toilet

Diverts 80% of Total Nitrogen From House

IWMI resource recovery from faecal sources

- works like a flush toilet, with a front section to divert urine
- urine is diverted to a storage container for periodic removal
- approx. 90 gallons of urine /person/year is produced
- less water is used because fewer flushes are needed
- urine contains most excreted medicines (pharmaceuticals)



Example of costs and benefits

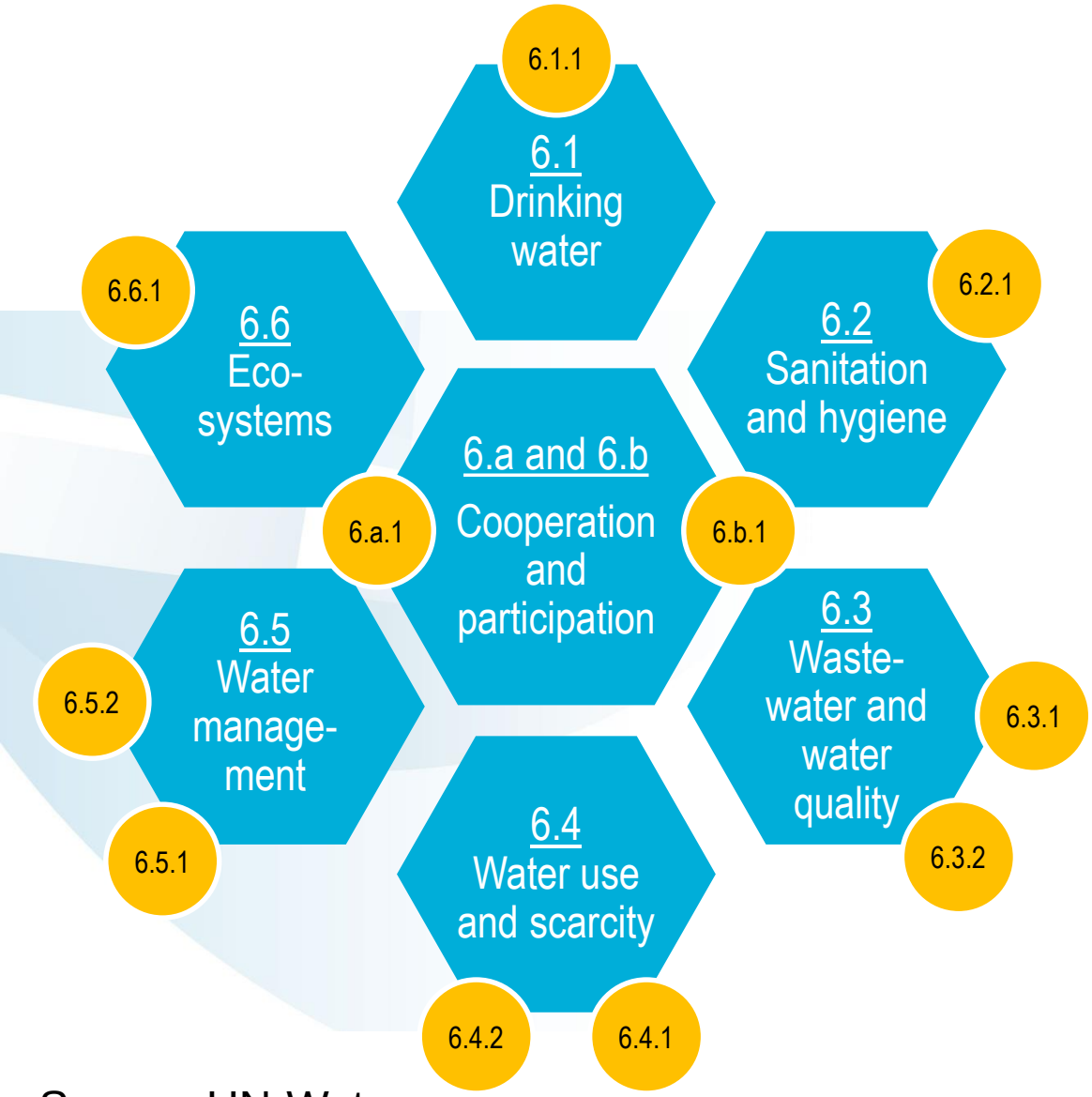
- Trucost global assessment of "Natural Capital at Risk" estimates the externalities of water pollution (primarily eutrophication) to be of the order of $300B.
- Report claims, Indian agriculture, would not be (financially) viable if these externalities were internalized.
- BeCleantech Report (Beck et al.) that $235B "profit" can be attached to nutrient resource recovery from CAFOs

Frame within wider ecosystem services and sustainability

Oregon, USA production of slow release fertilizer from waste water, reducing discharges to local river to improve water quality

With reduction of returning salmonid adults in Vancouver Island, P addition to improve physiology of smolting salmon

SDG 6 global indicators



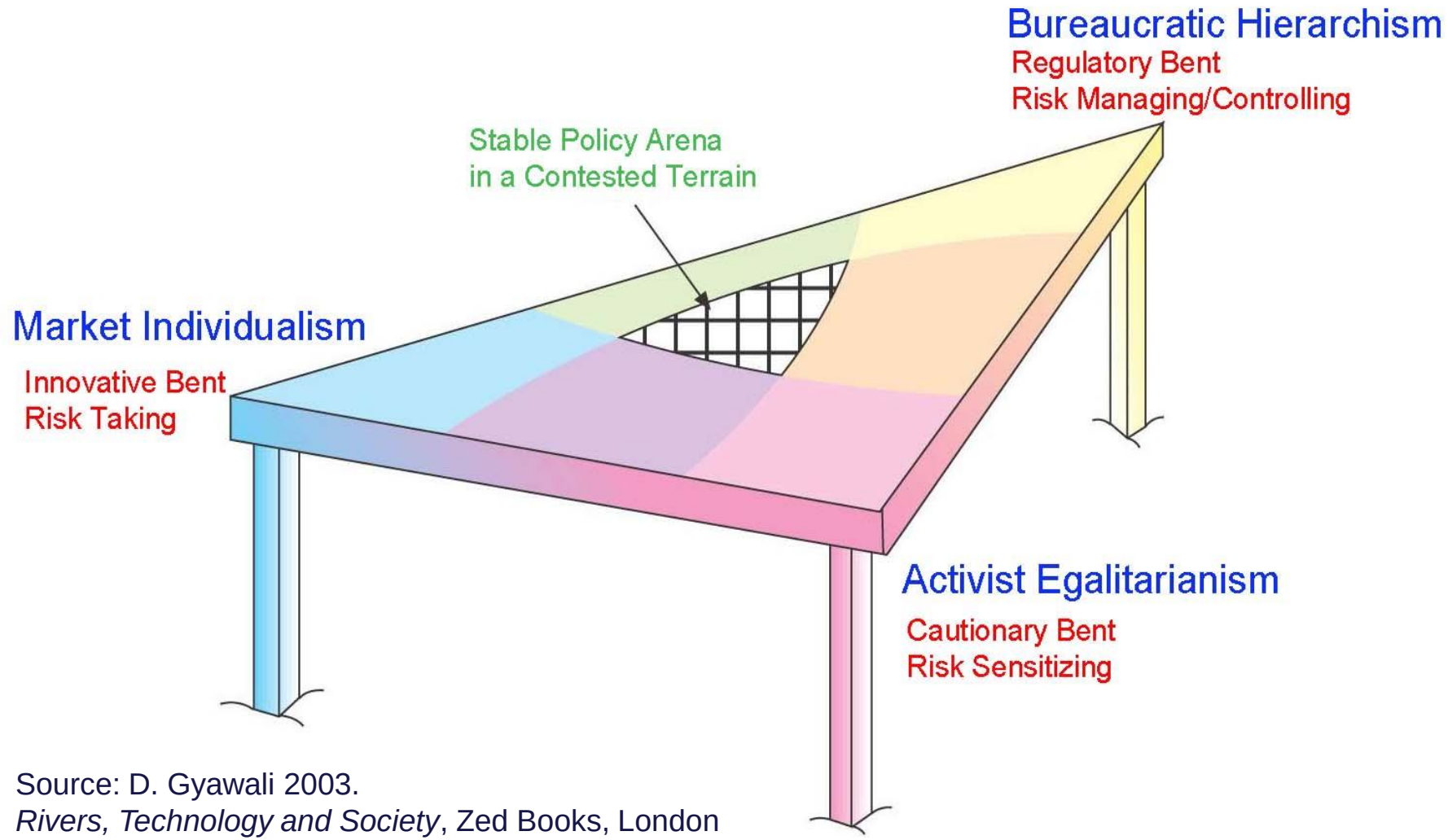
Source: UN-Water

6.1.1	Safely managed drinking water services (WHO, UNICEF)*
6.2.1	Safely managed sanitation and hygiene services (WHO, UNICEF)*
6.3.1	Wastewater safely treated (WHO, UN-Habitat, UNSD)**
6.3.2	Good ambient water quality (UNEP)***
6.4.1	Water use efficiency (FAO)***
6.4.2	Level of water stress (FAO)**
6.5.1	Integrated water resources management (UNEP)**
6.5.2	Transboundary basin area with water cooperation (UNECE, UNESCO)**
6.6.1	Water-related ecosystems (UNEP)***
6.a.1	Water- and sanitation-related official development assistance that is part of a government coordinated spending plan (WHO, UNEP, OECD)*
6.b.1	Participation of local communities in water and sanitation management (WHO, UNEP, OECD)*

Conclusion

1. Need paradigm shift from command and control to reconsideration of pollution as a resource management issue
2. To bring it about needs:
   a) Economic incentivisation recognizing potential wider ecosystem benefits
   b) Improved regulation- emerging contaminants
   c) Incorporate into sustainability agenda
   d) Change in knowledge, attitude and skills

Constructive Engagement of Plural Social Solidarities



Source: D. Gyawali 2003.
Rivers, Technology and Society, Zed Books, London

Acknowledgement:

The presentation draws extensively on past and ongoing work and effort led by Beck and Thomson.

http://www.iwa-network.org/ecosystem-services-not-so-much-the-water-as-whats-in-it/

Thank you

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