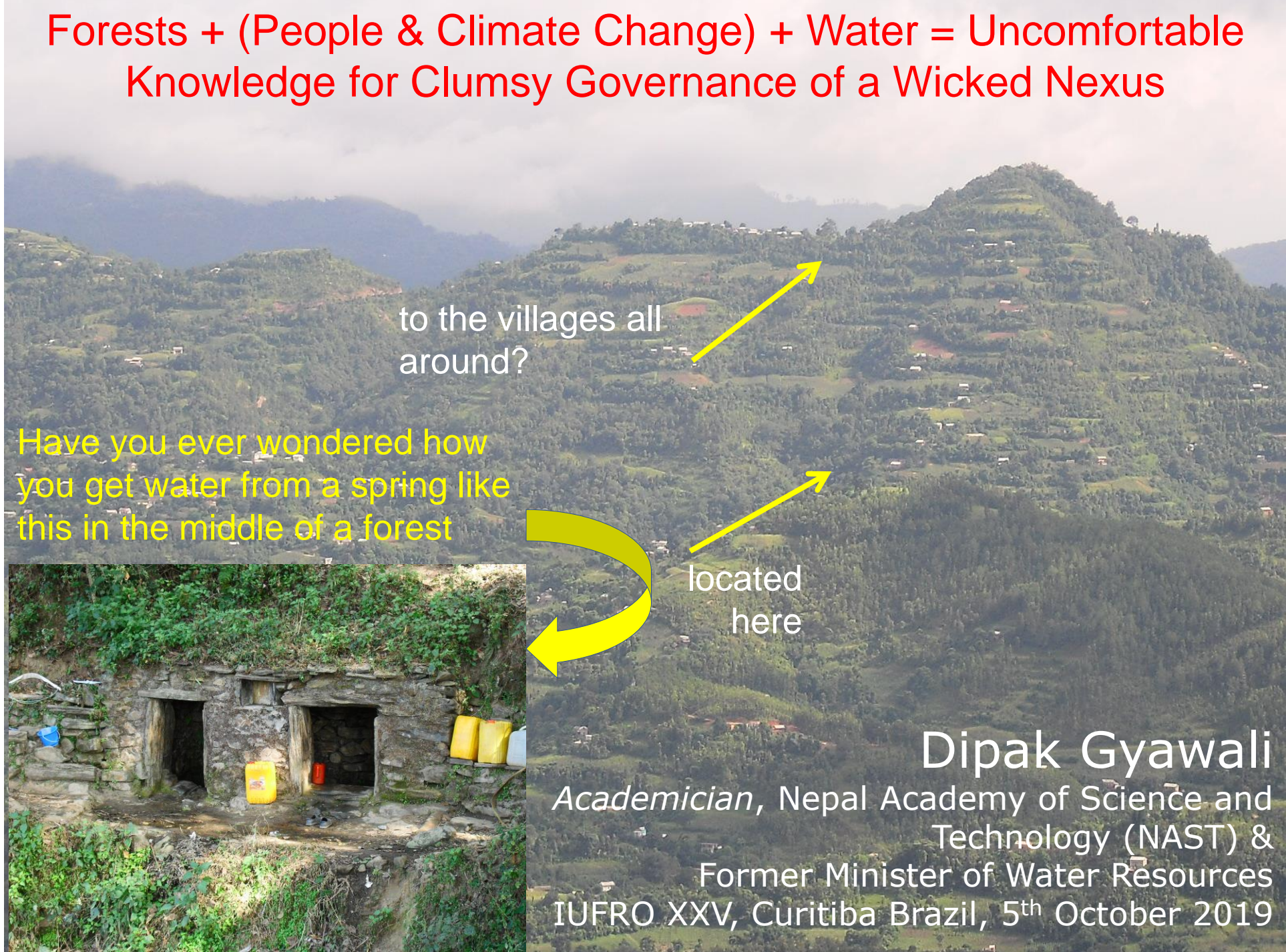


Forests + (People & Climate Change) + Water = Uncomfortable Knowledge for Clumsy Governance of a Wicked Nexus



to the villages all around?

Have you ever wondered how you get water from a spring like this in the middle of a forest



located here

Dipak Gyawali
Academician, Nepal Academy of Science and Technology (NAST) & Former Minister of Water Resources
IUFRO XXV, Curitiba Brazil, 5th October 2019

Some basic “uncomfortable knowledge” # 1

Climate Change was “caused” by the energy sector

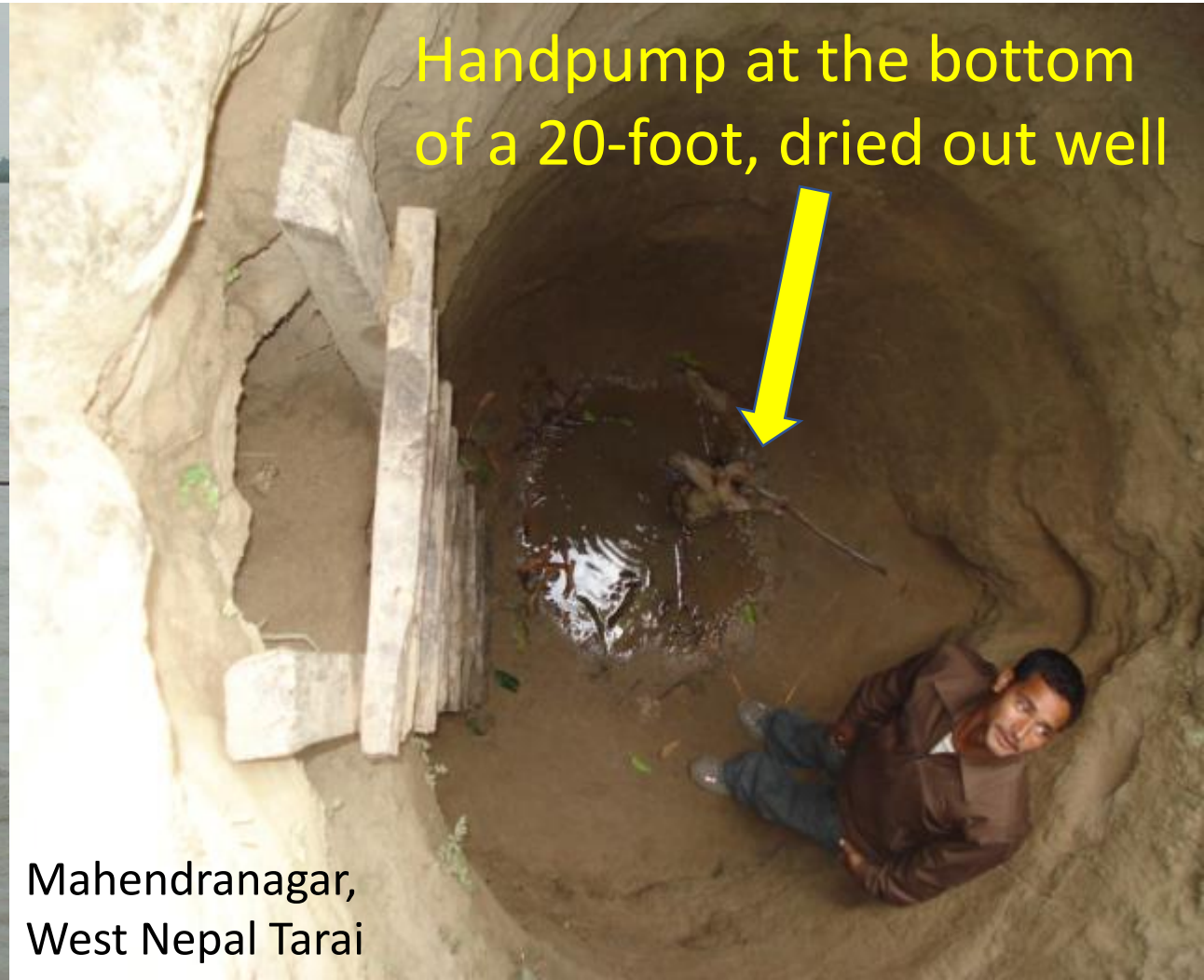
But

Society is affected mainly through its impact on the
water sector

Too much water

“at the wrong time, wrong place lacking proper infrastructure and/or institutional capacity to deal with these increasing surprises and stressors”

Too little water



Mahendranagar,
West Nepal Tarai

And do not forget the changes in atmospheric humidity and soil moisture (the marginalized aspects of water policy)

that

allows the emergence of disease vectors (for plants, animals and humans) to migrate and appear in agroclimatic zones that never had them.

Currently we have little or no prophylactics allowing us to resist this inexorable onslaught, especially when they emerge as nasty surprises

Some basic “uncomfortable knowledge” # 2

If Climate Change is saying couple of simple thing loud and clear, it is these:

- that our future is going to be very different from our past
- that global temperatures are rising is in no doubt: however, what this is doing to precipitation is wildly uncertain

One thing it does to the water engineering profession is to **throw our standard design methodology**, (i.e. estimating maximum probable flood from limited data points, regression-analyzing them and designing dams and spillways accordingly with those risk probabilities in mind) **out of the window**





For Policy Studies, what this means is the need for scientists to be more aggressive in stepping out of their comfort zones, and engaging with society in “myth busting”, i.e. generating uncomfortable knowledge, the real policy engagement!

Water Scarcity: Nepal Country Snapshot:

Nepal (like much of South Asia) is a Semi Arid Region
rich in
Four Months (June-September) of Monsoon Floods
And
Eight Months (October-May) of Drought



NWCF Working Paper 1/2019

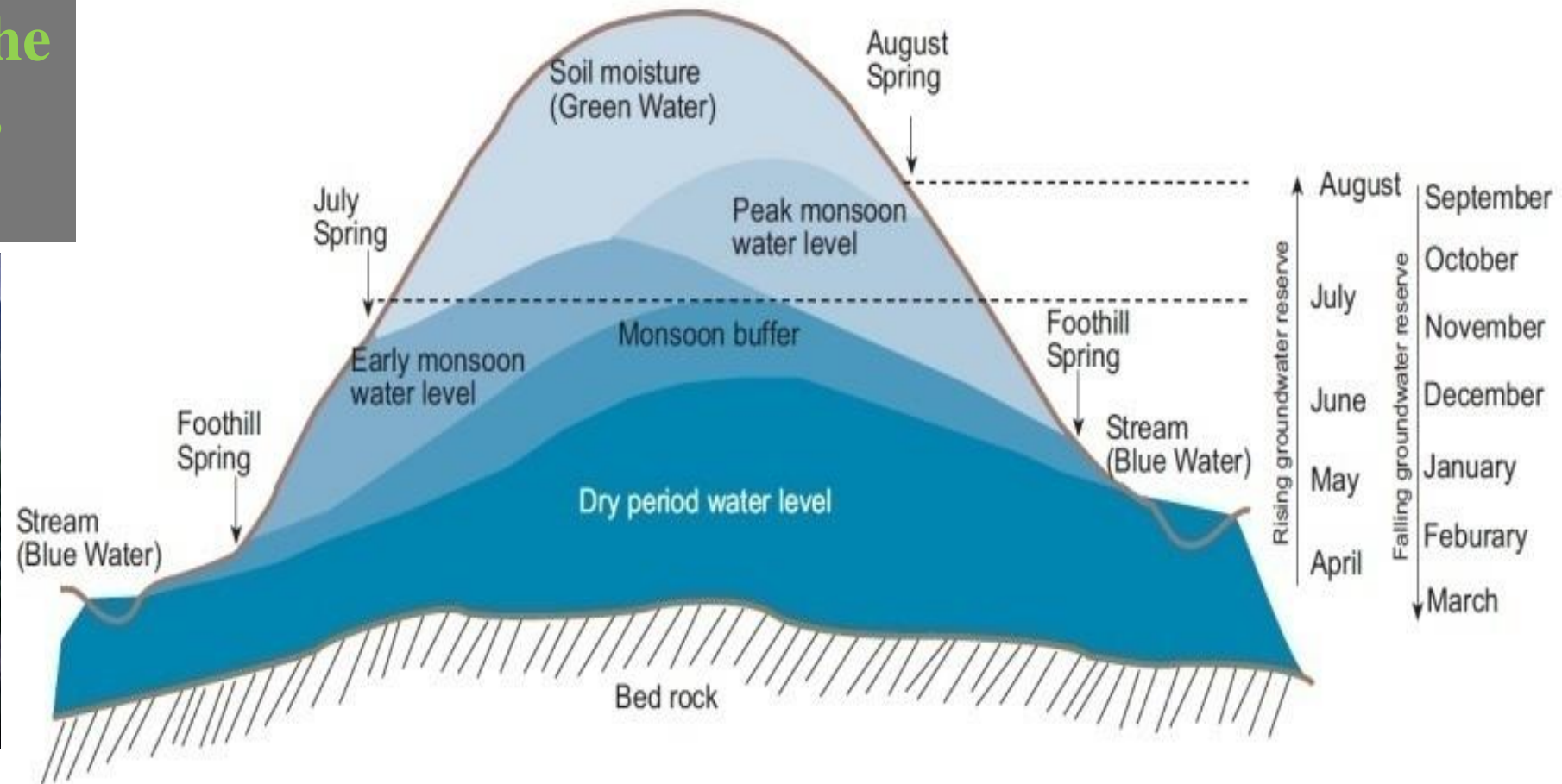
Source: <http://www.nwcf.org.np/working-paper/>

How?

- ✓ More Toad's Eye Science without ignoring Eagle's Eye Science
 - ✓ Water has to move from IWRM to Water-Energy-Food Nexus which is infinitely more challenging
 - ✓ More “nexus” at lowest units of governance and actual implementation: only broad goal-setting and monitoring at the higher levels
-
- 1986 Mohonk Conference debunking Theory of Himalayan Degradation
 - Akin to “snowline”, there is a “firewood line” beyond which it is simply uneconomical for a villager to chop trees and try selling in the market
 - Actual water use at village and household levels is highly gender-differentiated: during droughts, role shifts between men and women
 - Traditional technologies can oftentimes be superior in terms of both effectiveness and equity to modern technologies: control of landslides by ponds rather than check dams

A Generalized Concept of the Water Tower in the Mid-Hills of Nepal

Monsoon rains fill the 'water tower' and create the buffer for the arid season that keeps rivers alive!!



Source: Sharma et al (2016) *Springs, Storage Towers, and Water Conservation in the Midhills of Nepal*, ICIMOD/NWCF WP 2016-/3, Kathmandu.

<http://lib.icimod.org/record/32016/files/icimmodWP16-3.pdf>

THOMPSON • WARBURTON • HATLEY

Uncertainty

ON A HIMALAYAN SCALE

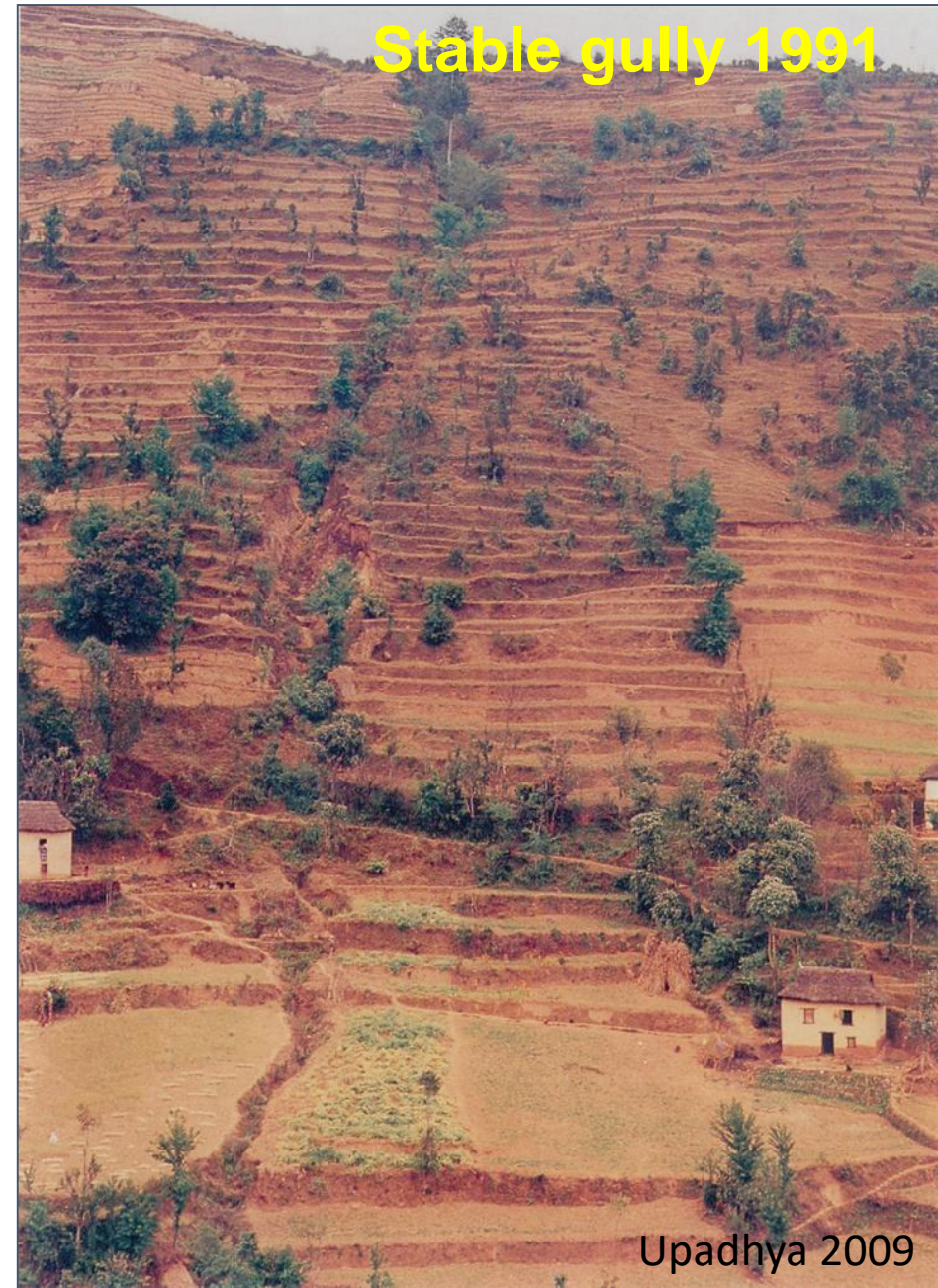
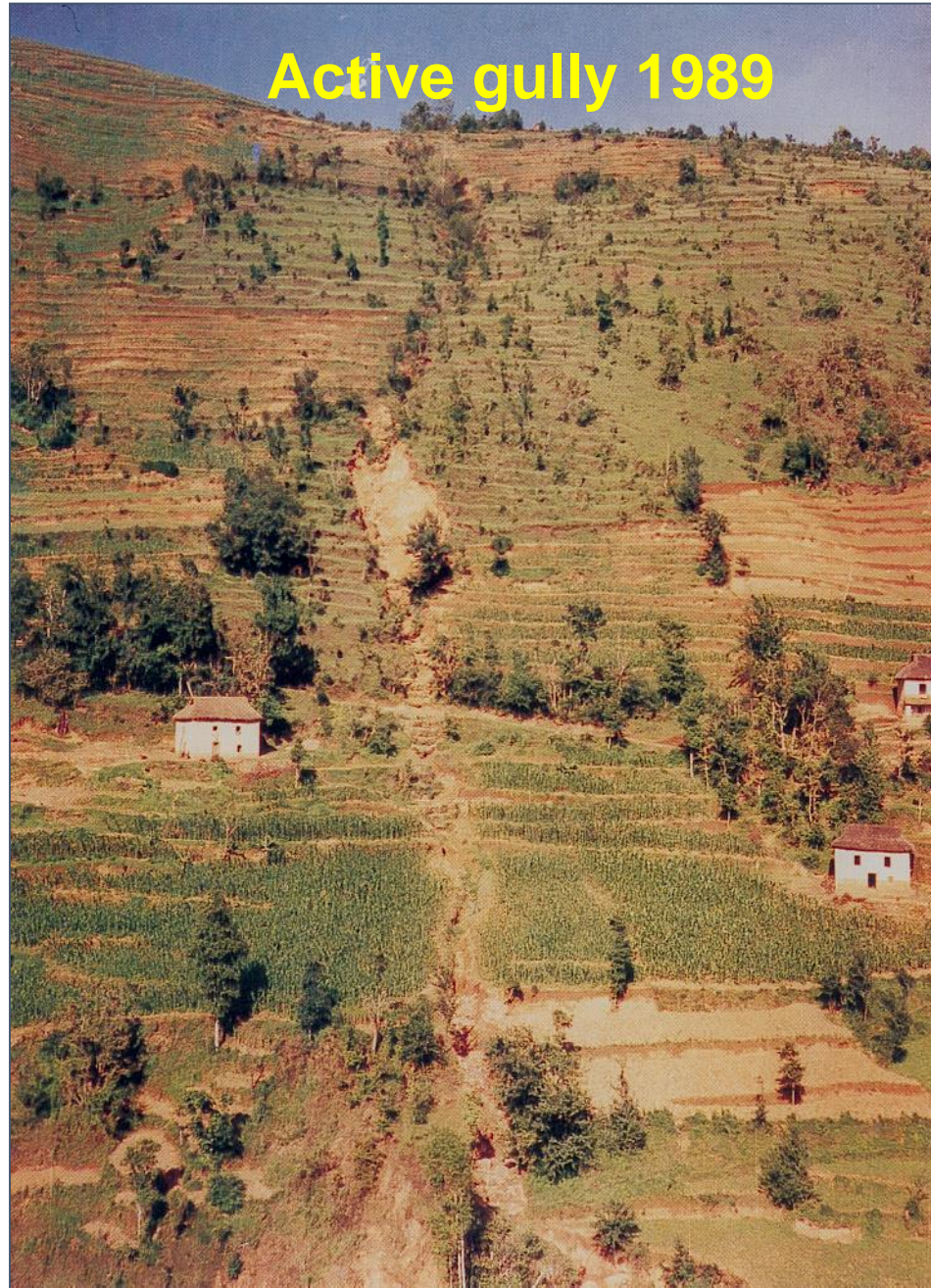


With new introduction by
Michael Thompson and Dipak Gyawali

M. Thompson, M. Warburton and T. Hatley (2007) *Uncertainty on a Himalayan Scale: and institutional theory of environmental perception and a strategic framework for the sustainable development of the Himalaya*. Kathmandu: Himal Books with James Martin Institute for Science and Civilization, Oxford University and International Institute for Applied Systems Analysis, Vienna. {The earlier edition was published in 1986 by Milton Ash Editions of Ethnographica, London.}

Theory of Himalayan Degradation (THED) long held sway over watershed science until debunked by the Mohonk Conference. While forest and grass cover are crucial to prevent topsoil erosion, they do little to stop mass wasting in the Himalaya: that is due to geotectonic and orographic instability compounded by monsoon downpour washout, resulting in mass wasting that is many times more than top soil loss.

The results of ridgetop ponds versus check dams



Core message

Ponds helped reduce the peak of the monsoon hydrograph and store water/recharge groundwater for winter in the system. The following were the visible benefits

- **Landslide stabilization**
- **Gully stabilization**
- **Green water preservation**
- **Increased maize production by 50%**

Question: why did the development agency that supported this innovative “uncomfortable knowledge generation” itself learn nothing, did not feed it back to improve its own development programs?



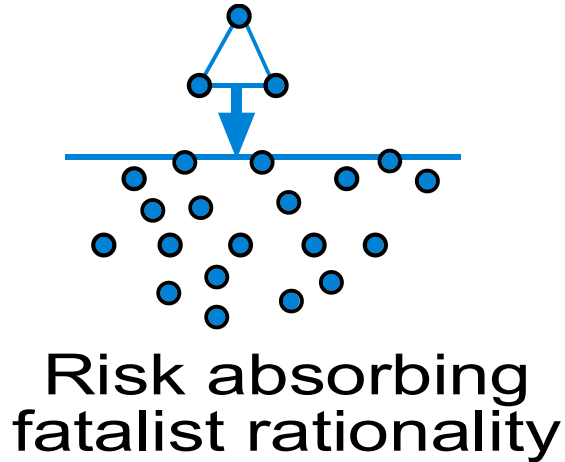
This learning from the EU-supported Bagmati Watershed Project is discussed by Upadhya, M (2009) *Ponds and landslides: water culture, food systems and the political economy of soil conservation in midhill Nepal*. Kathmandu, Nepal: Nepal Water Conservation Foundation (NWCF). (A longer Nepali version was published by NWCF and ICIMOD in 2069 BS as *Pahiro Ra Pokhari*.) The issues behind ponds and water/soil moisture/vegetation conservation is summarized in: <http://lib.icimod.org/record/30276>

Cultural Theory to the rescue...

Why should foresters should pay heed to it? Because it comes from a synthesis of theoretical work done by social anthropologists (Mary Douglas *et al*) and ecologists (C. S Holling)

- Cultural Theory (or Neo-Durkheimian Theory of Plural Rationalities/New Institutionalism) gives a better understanding of what water and forest governance, which are wicked problems individually and more so jointly, should look like.
- In pluralization of organizational proclivities (bureaucratic hierarchism, market individualism and activist egalitarianism), giving each not just a voice at the policy table but also responding to their concerns and, with that multiple “problem feeding”, redefining the problems and potential solutions, lies the probable answers of sustainable governance.

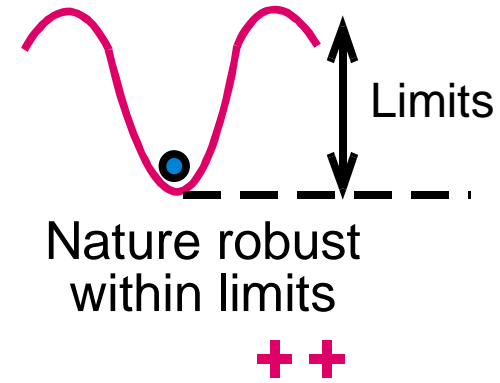
Voter and Consumer Fatalism: unbound but suppressed by structure world of *Donkeys*



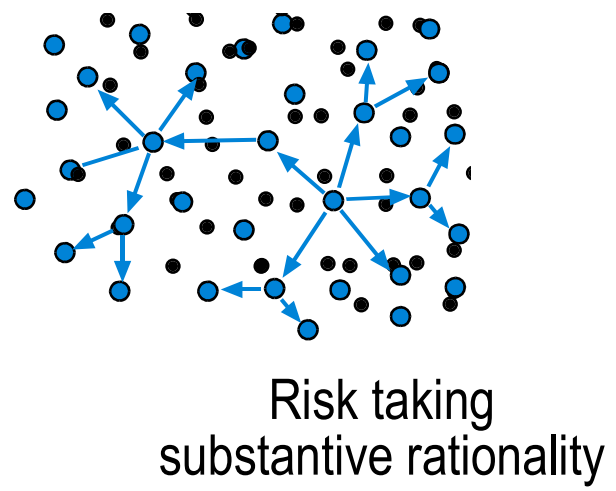
+ve GRID
(asymmetrical transactions, inequality, strong ascribed order)

C O M M O D I T I Z E
M A N A G E

Bureaucratic Hierarchism: bound, ranked and structured world of *Wolves*



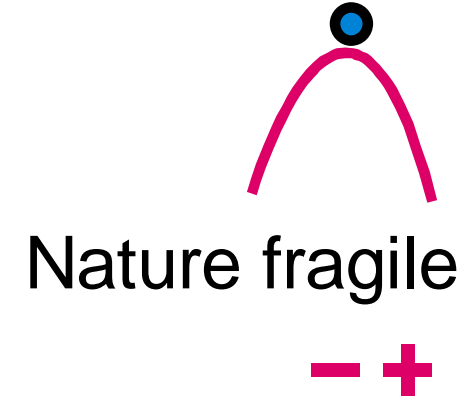
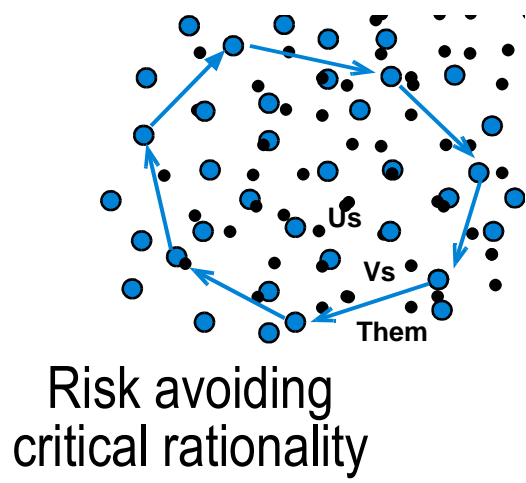
Market Individualism: unbound, unstructured networks of *Hawks*



- ve GRID
(symmetrical transactions, equality, weak ascribed order)

C O M M O D I T I Z E
T A B O O

Activist Egalitarianism: bound, unstructured world of *Vultures*



-ve Group

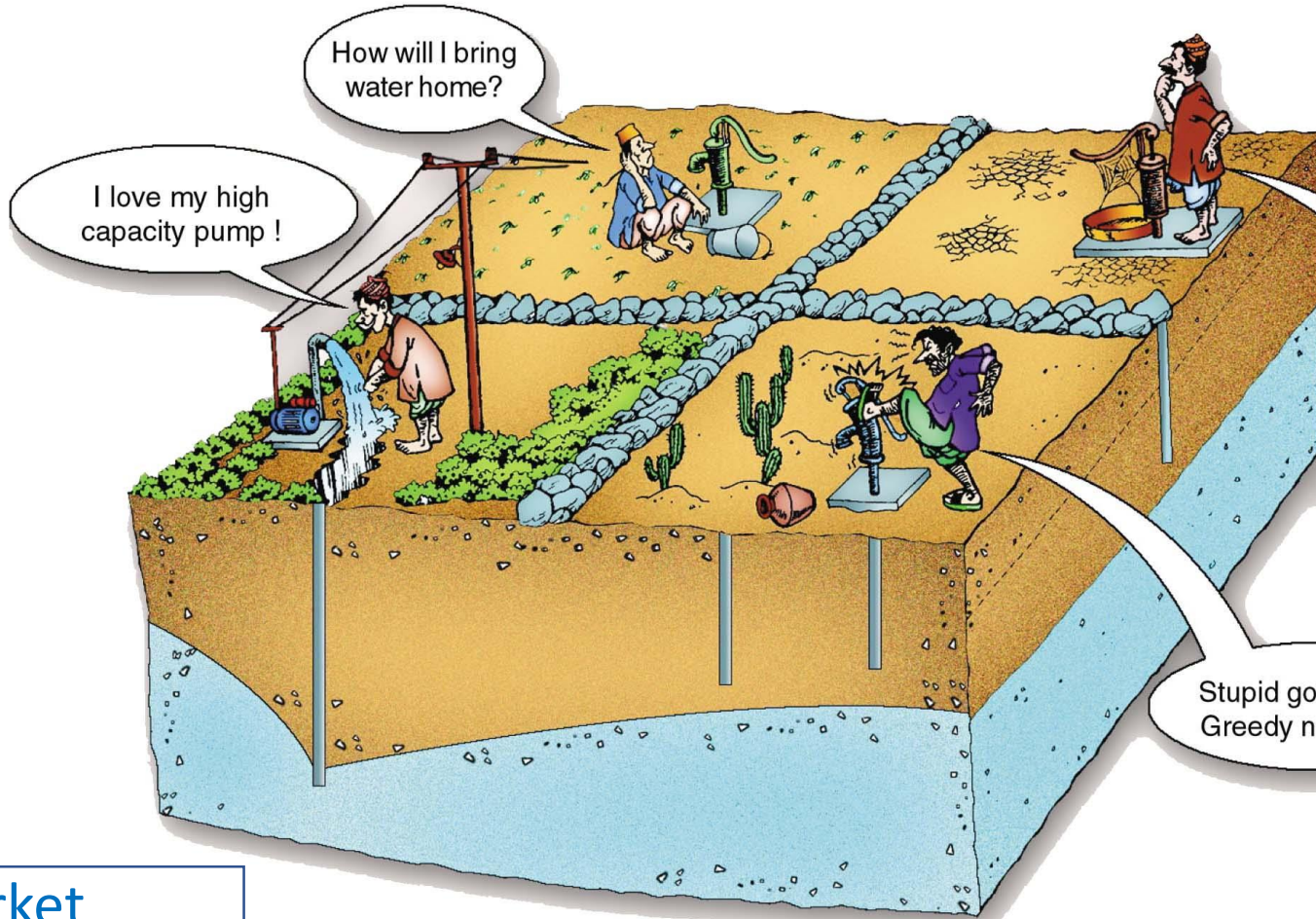
+ve Group

Mass(Voter/Consumer)
Fatalism

State
Hierarchism

Club
Goods

Public
Goods



Private
Goods

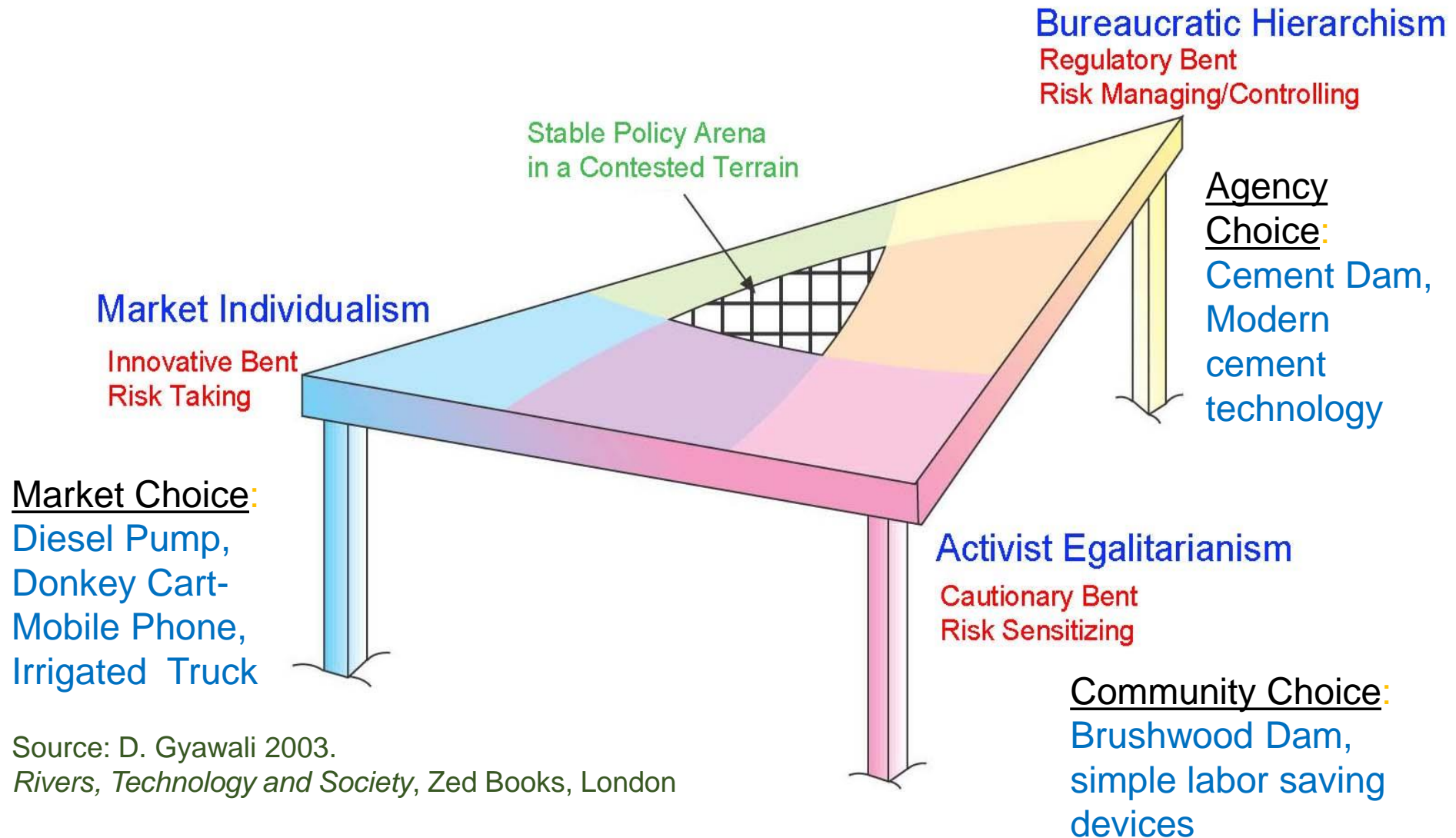
Common
Pool
Goods

Market
Individualism

Activist
Egalitarianism

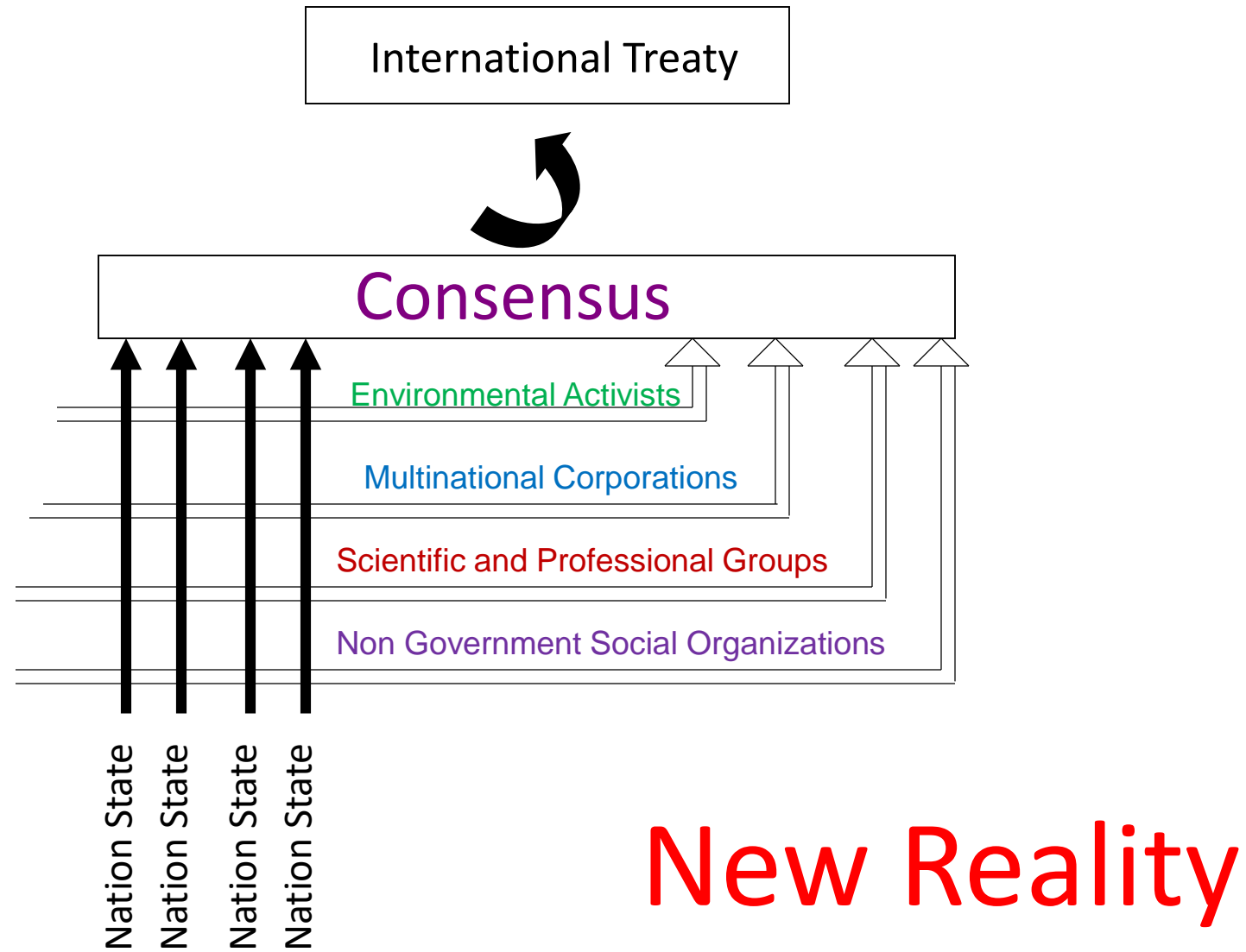
Cultural Theory of Social Response to Groundwater Overdraft

Constructive Engagement of Plural Social Solidarities



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

- Hierarchism: Coercive Power (*Tamasik*), Strategy of Codes and Procedures
- Individualism: Persuasive Power (*Rajasik*), Strategy of Networking Freedom
- Egalitarianism: Moral Power (*Satwik*), Strategy of Critique



Based on S. Rayner and E. Malone 1998: *Social Science Insights in Climate Change*, in *Human Choice and Climate Change*, Pacific Northwest National Lab, Battelle Press, Ohio.

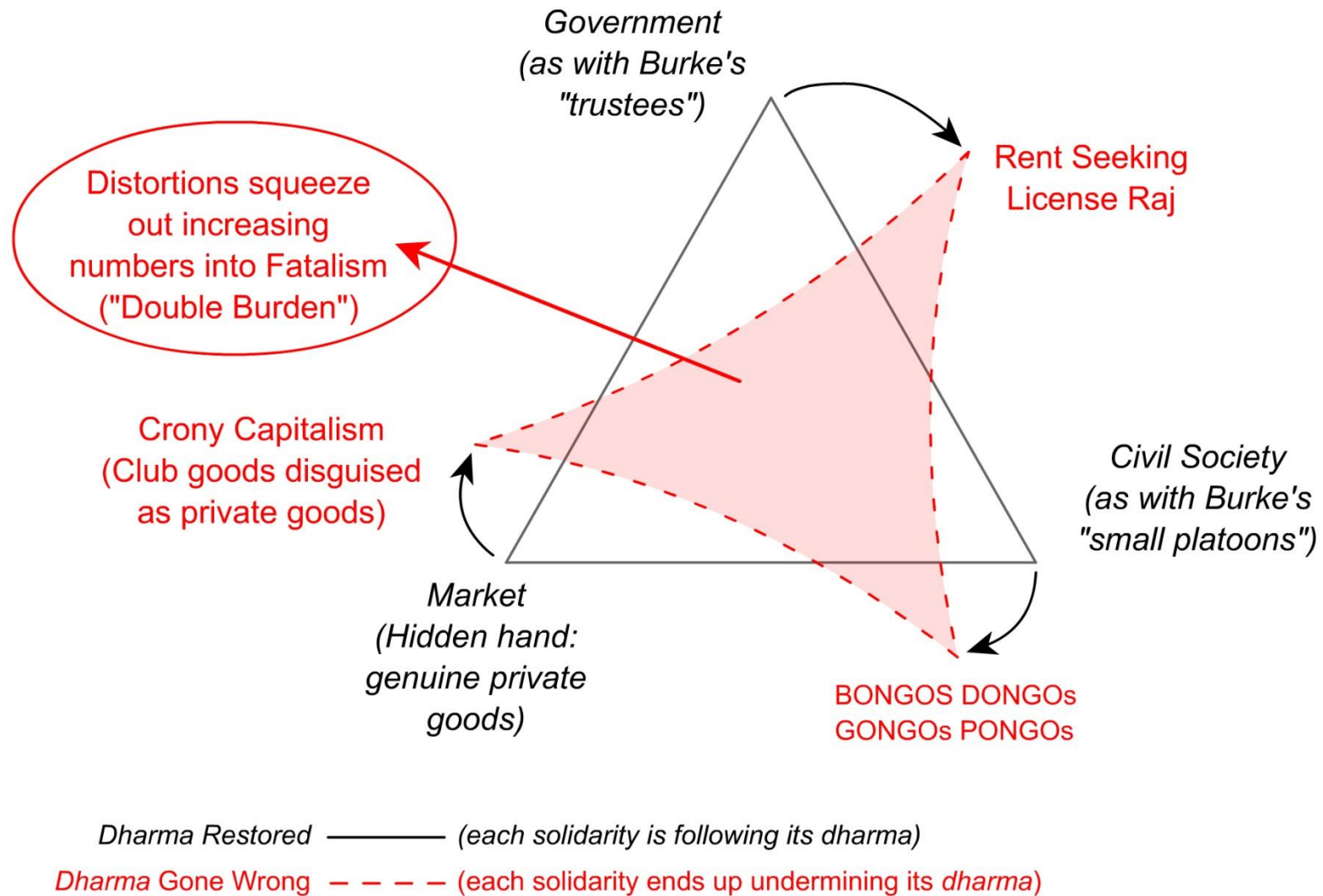


Figure : 1.1 *Dharma* and its dynamics

From: Gyawali, Thompson and Verweij (2017: EARTHSCAN Routledge/UK)
Aid, Technology and Development: *The Lessons from Nepal*

Some basic “uncomfortable knowledge” # 3:

Both forest and water folks missing the forest for the tree?

Forest Folks:

- move beyond focusing on forests only as carbon sinks to forest-water-people-carbon nexus
- re-conceptualize public common pool lands (more than forests!) as major water consuming entities, depending on the climatic and hydro-geological characteristics of the region

Water Folks: move beyond transboundary surface water to

- transcending disciplinary boundaries (water not just a civil engineering and economics subject!)
- looking more closely at atmospheric humidity, soil moisture, groundwater and increasing instances of extreme events

Both: move away from Public-Private Partnership to Public-Private-Civic Partnerships {Not PPP but PPCP}

Some additional references that this keynote speech draws on:

On the debunking of the Theory of Himalayan Degradation:

- ✓ Ives, J.D. & Ives, P., eds. 1987. *The Himalaya-Ganges problem*. Proceedings of a conference, Mohonk Mountain House, New Paltz, New York, USA, 6-11 April 1986. Mountain Research and Development (special issue), 7(3): 181-344.
- ✓ Jack D. Ives and Bruno Messerli (1989) *The Himalayan Dilemma Reconciling Development and Conservation* UNU The United Nations University with ROUTLEDGE London and New York
<http://lib.icimod.org/record/9778/files/850.pdf>

On “Toad’s Eye Science”:

- Gyawali, D. and Thompson, M. 2016. *Restoring Development Dharma with Toad’s Eye Science* IDS Bulletin Special 50th Anniversary Issue <http://bulletin.ids.ac.uk/idsbo/article/view/2822>

On Water-Energy-Food Nexus and Inter/Trans-disciplinarity:

- ❑ Gyawali, D. (2015). Nexus Governance: harnessing contending forces at work, Nexus Dialogue synthesis paper. Gland, Switzerland: IUCN
<http://waternexussolutions.org/ContentSuite/upload/wns/file/Nexus%20Governance%20Harnessing%20Contending%20Forces%20at%20Work.pdf>

On Cultural Theory:

- ❖ Thompson, M. (2008). *Organising and Disorganising: a dynamic, non-linear theory of institutional emergence and its implications*. UK: Triarchy Press
- ❖ Verweij, M. and Thompson, M. (2006). *Clumsy Solutions for a Complex World: governance, politics and plural perceptions*. London: Palgrave