

# Which Pathways to Sustainability Nirvana?



Broadening the Framework for  
Socio-Political Sustainability of  
Water Technologies while  
Contending with Contradictory  
Certitudes

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ESCAP/CSIR/NISTADS Workshop on Science, Technology,  
Innovation and Management for Water Sustainability  
New Delhi, 19<sup>th</sup> April 2017

## Some References indicating where I am coming from:

New Earthscan/UK book “Aid, Technology and Development – the lessons from Nepal”:  
<https://www.routledge.com/Aid-Technology-and-Development-The-Lessons-from-Nepal/Thompson-Gyawali-Verweij/p/book/9781138656918>

The gist of the philosophy behind it is in a special 50<sup>th</sup> Anniversary issue of IDS Bulletin:  
<http://bulletin.ids.ac.uk/idsbo/article/view/2822>  
which is part of a larger set of articles: <http://bulletin.ids.ac.uk/idsbo/issue/view/221>

My Nexus Governance paper out of IWA/IUCN: [http://www.iwa-network.org/wp-content/uploads/2016/03/1448008531-Nexus-Governance-Harnessing-Contending-Forces-at-Work\\_Dialogue-Synthesis-Paper-2015.pdf](http://www.iwa-network.org/wp-content/uploads/2016/03/1448008531-Nexus-Governance-Harnessing-Contending-Forces-at-Work_Dialogue-Synthesis-Paper-2015.pdf)

Bulletin of Atomic Scientists roundtable discussions on what Trump means for climate financing: <http://thebulletin.org/commentary/trump-just-what-climate-doctor-ordered10584> which is part of a larger set of debates: <http://thebulletin.org/expert-views-climate-finance-age-trump10486>

A version in more readable font was reprinted in Thirdpole  
<https://www.thethirdpole.net/2017/03/06/trump-just-what-the-climate-doctor-ordered/>

How the concept of power plays out in a more just management of electric power in Bulletin of Atomic Scientists Improving Women’s Lives: <http://thebulletin.org/expanding-energy-access-improving-womens-lives>

## Some Additional References contd...

online journal Water Alternatives: [http://www.water-alternatives.org/index.php?option=com\\_content&task=view&id=45&Itemid=1](http://www.water-alternatives.org/index.php?option=com_content&task=view&id=45&Itemid=1)

•Dipak Gyawali in SAWAS “pluralized water policy terrain:  
[http://www.sawasjournal.org/index.php?option=com\\_content&view=article&id=48&Itemid=65](http://www.sawasjournal.org/index.php?option=com_content&view=article&id=48&Itemid=65)

•Dipak Gyawali lecture at Tsukuba University School of Environmental Diplomacy:  
[http://www.youtube.com/all\\_comments?threaded=1&v=suaLm37qEFg](http://www.youtube.com/all_comments?threaded=1&v=suaLm37qEFg)

•Dipak Gyawali ORF Issues Brief No. 131 on Collective Action on South Asia’s ‘Wicked Problems’; Observer Research Foundation, New Delhi March 2016:  
[https://n.openearth.net/wp-content/uploads/sites/3/2016/04/ORF-Issue-Brief\\_131\\_Dipak-Gyawali.pdf](https://n.openearth.net/wp-content/uploads/sites/3/2016/04/ORF-Issue-Brief_131_Dipak-Gyawali.pdf)

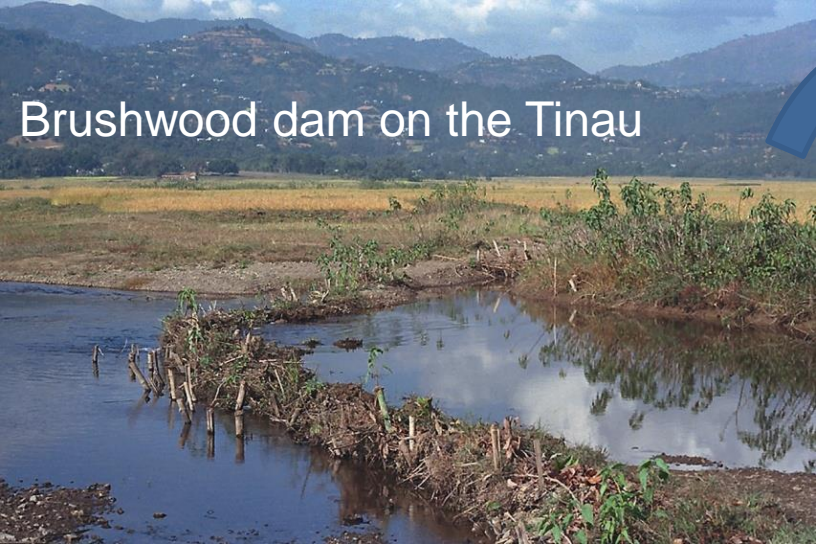
Dipak Gyawali in SAWAS “pluralized water policy terrain:  
[http://www.sawasjournal.org/index.php?option=com\\_content&view=article&id=48&Itemid=65](http://www.sawasjournal.org/index.php?option=com_content&view=article&id=48&Itemid=65)

Looks like a truck, quacks like a truck, but is not a truck –  
What IS it?



A DESAKOTA phenomenon! The Ubiquitous *Jugad*!!

Need to discuss the SCIENCE of *Uncomfortable Knowledge*, its PRACTICE, and the EVOLVING THEORETICAL APPROACH that might provide some light for the path ahead.



Brushwood dam on the Tinau



Tinau's Hattisunde Barrage high and dry



Groundwater pumping in Marchawar

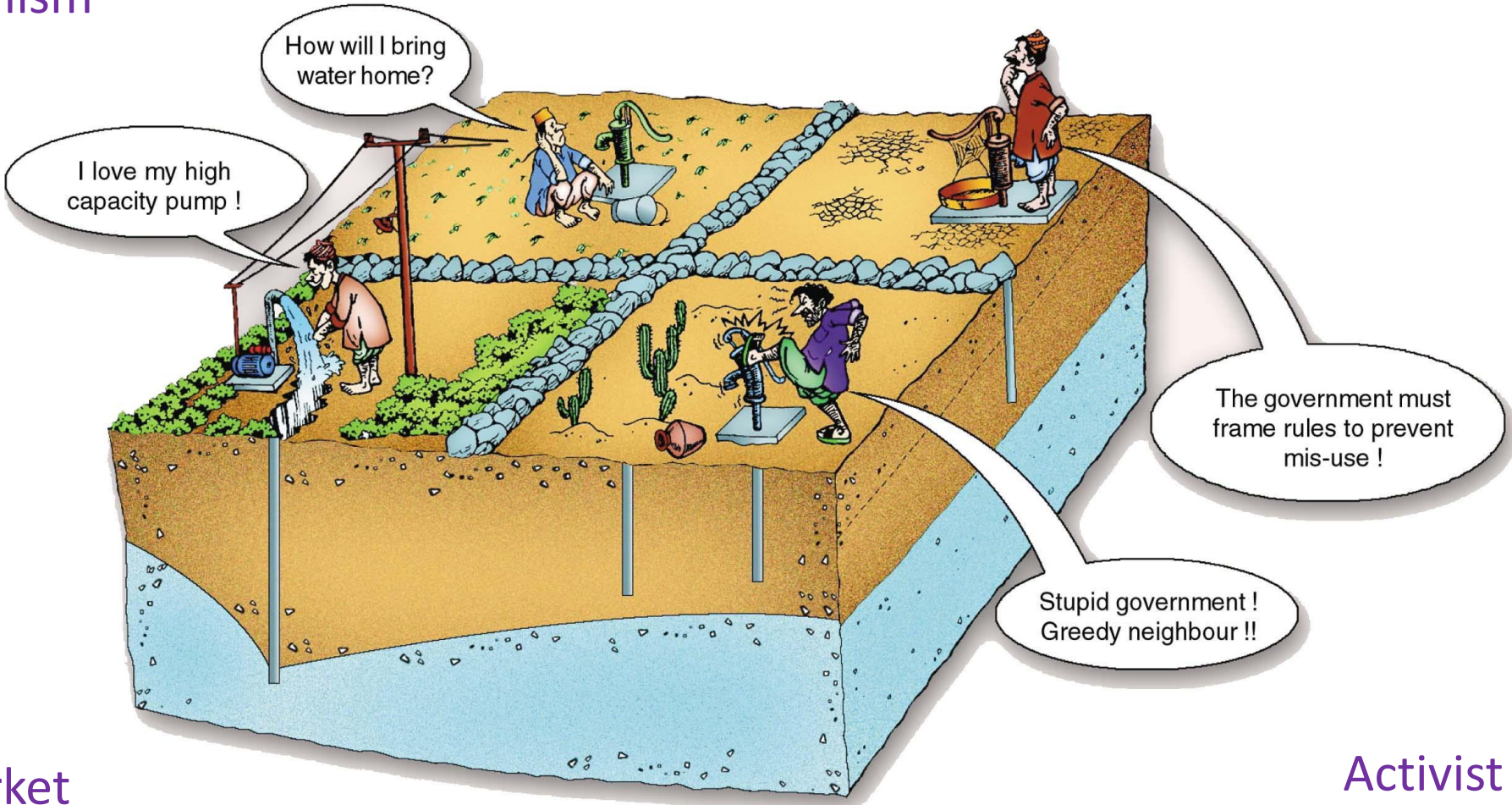
The Cultural Theory of social solidarities and their technological choices.

What technology? Whose technology?  
What are the risks and who bears them? Who is resilient? Who sinks under?

Hegemony of Runaway Technology??!  
What space for 'Toad's Eye Science' vs 'Eagle's Eye Science'?

Mass  
(Voter/Consumer)  
Fatalism

State  
Hierarchism

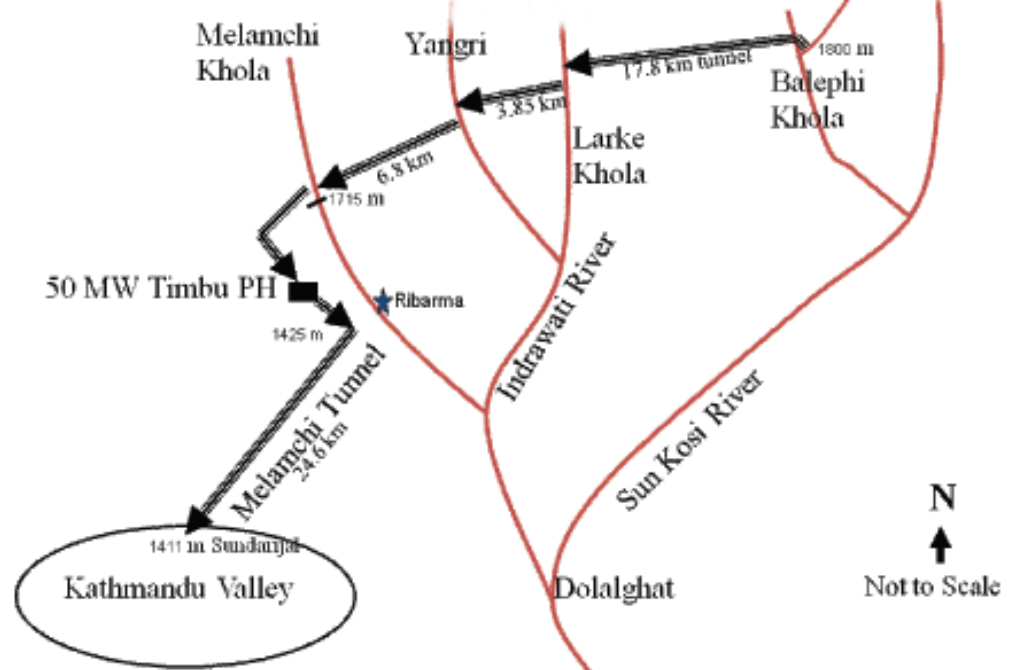
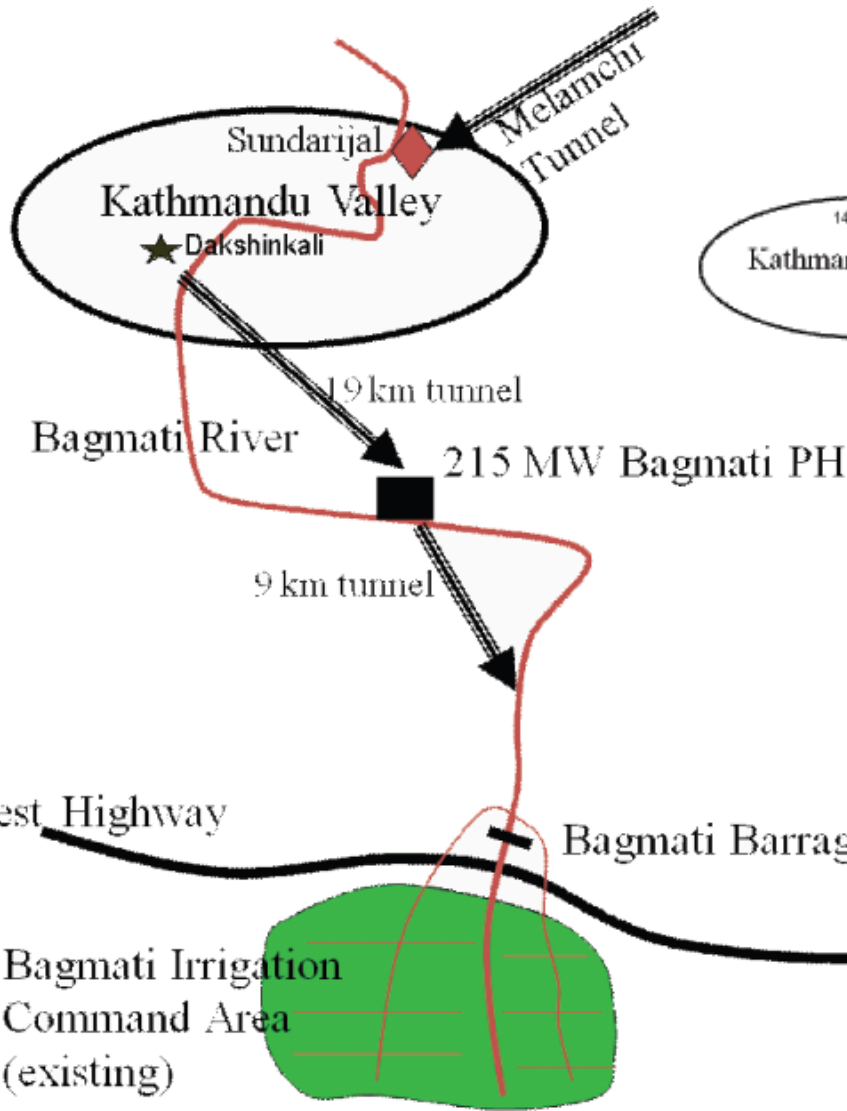


Market  
Individualism

Activist  
Egalitarianism

# Social Response to Groundwater Overdraft

# Melamchi Water Supply Scheme for Kathmandu Valley



Nepal's  
NGO  
Forum:

“Bigger  
Melamchi,  
Multipurpose  
Melamchi!!”



# De-nexused scenario at Kulekhani:

## Upstream:

- ✓ Government-owned parastatal Nepal Electricity Authority runs 60 MW peaking storage Plant
- ✓ Some 307 families around the reservoir (most of whom lost their land due to submergence) run informal fish harvesting system

## Downstream:

- Government-owned parastatal Nepal Water Supply Corporation “owns” water supply and sewerage systems of Nepal’s municipalities
- About two years ago, management of Hetauda’s water supply system transferred to a local board
- About a dozen Farmer-managed Irrigation Systems (FMIS) run traditional irrigation systems of 30 to 150 hectares
- Parsa Wildlife Forest Reserve and Chitwan National Park



# Arun-3 vs. alternative

## Arun

## Alternative

Power

201

283

Cost m\$

1082 (est. 1995)

~650

Avg. cost

\$ 5000/kW

~2300/kW

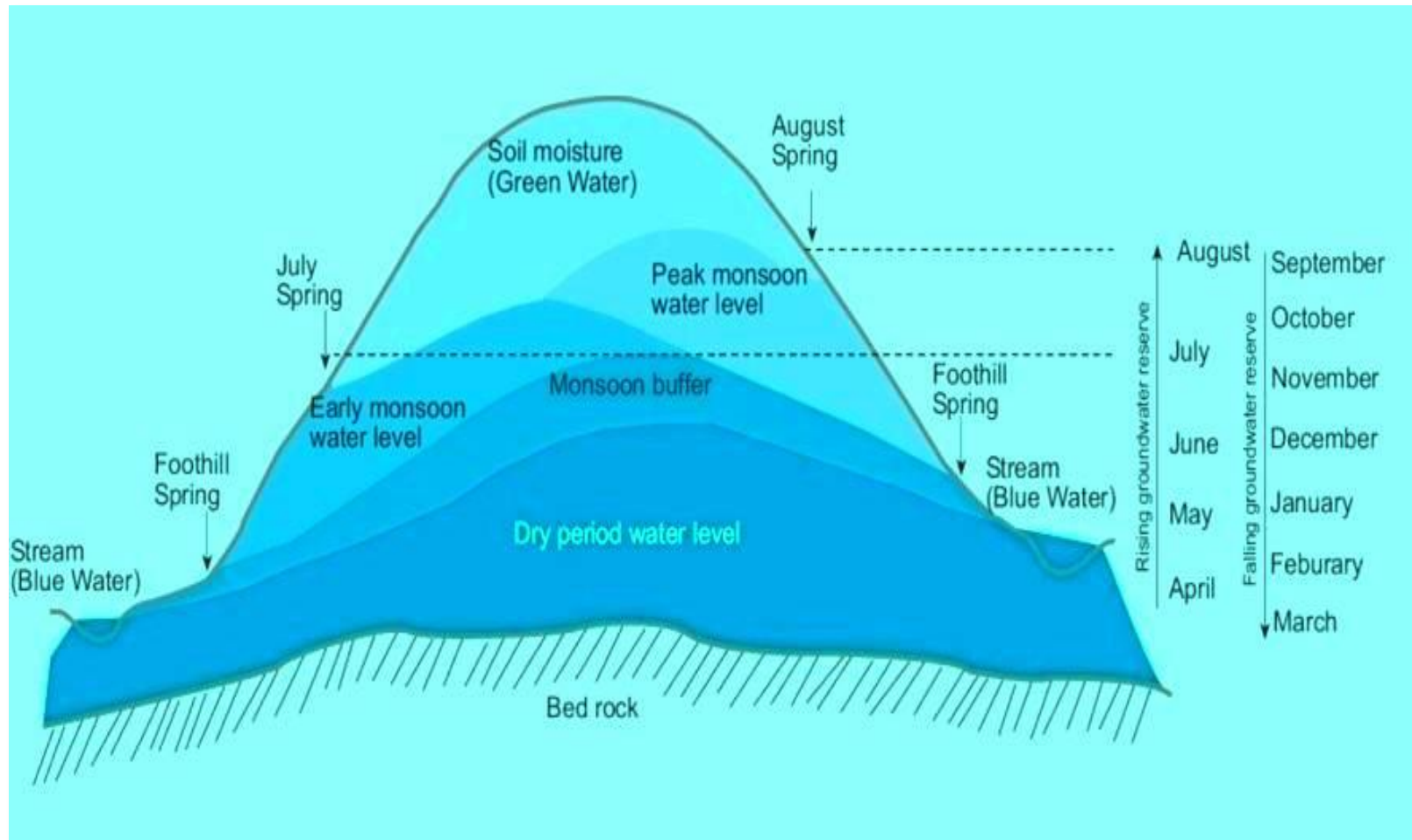
Time

13 Years (?)  
(1996-2008)

6 Years  
(1996-2001)

**Alternatives almost a third more  
at half the cost, half the time**

# SPRINGS, STORAGE TOWERS AND WATER CONSERVATION: EXPLORING DECENTRALIZED WATER MANAGEMENT SCIENCE FOR THE MIDDLE HILLS OF NEPAL



Typical Middle Mountain “Water Tower”

# Pond Construction: Humagaithok Pokhari, Daraunepokhari VDC, Dapcha Study Site

**Before**



**After**



## D. Gyawali et al, 2004. Ropeways in Nepal: Context, Constraint and Co-Evolution

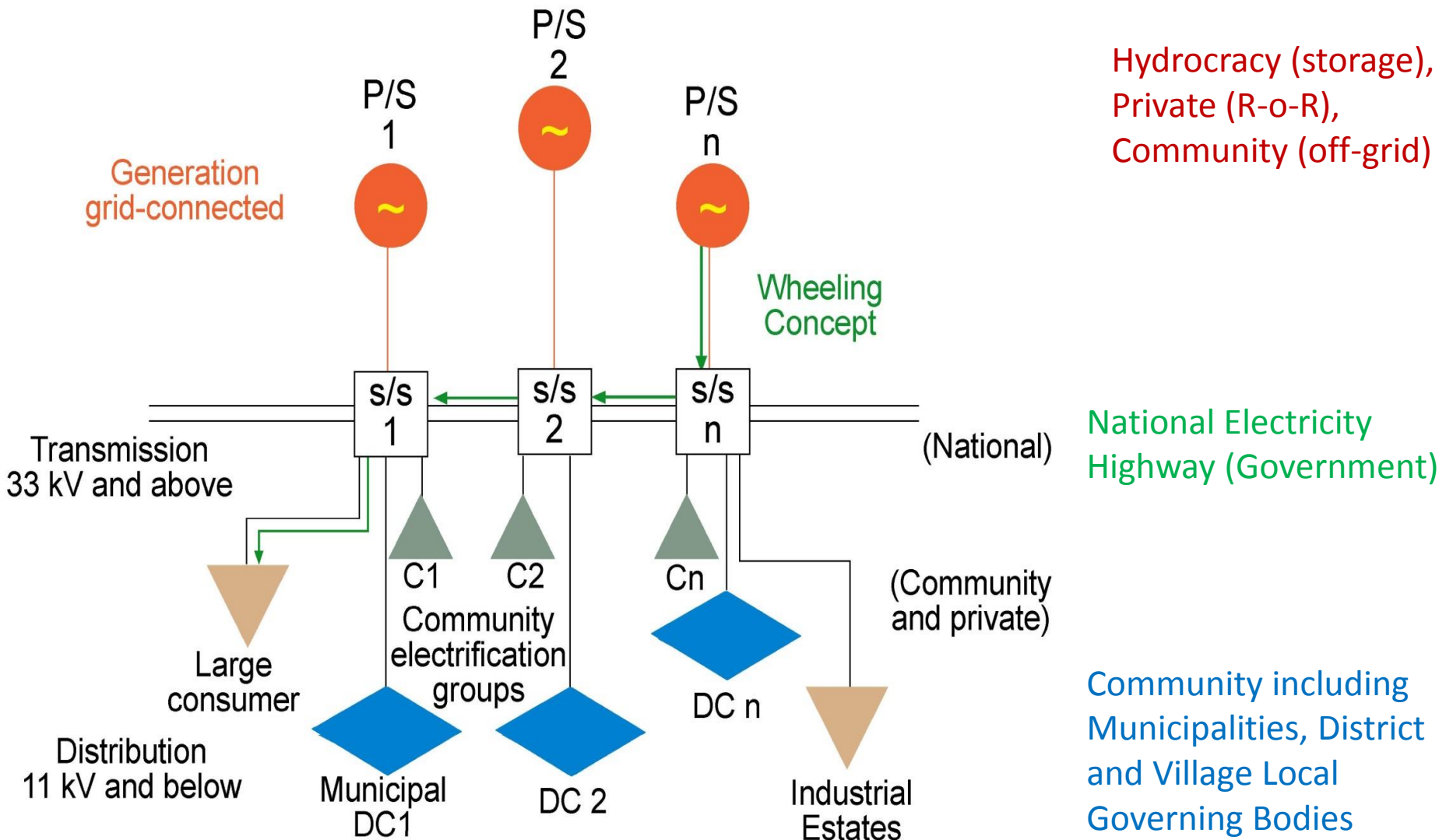
- Three times cheaper to build than an equivalent, cheap gravel “green road”
- Eight times quicker to install (in one season)
- Two times more energy efficient (34 MJ/ton for ropeway vs 53 MJ/ton for road; Bhattedanda Milkway: Rs 7000/month of NEA hydro vs Rs 34000/month of diesel)



# Community Electricity in Nepal

- ❑ **Started in 2003 with Community Electricity Bylaws and Eighteen communities, large (South Lalitpur) and small (Alau near Birganj)**
- ❑ **Purpose: devolution of power to consumers; double accounting to eliminate theft; creative demand expression and management**
- ❑ **Currently 251 active community electricity groups involving 338,000 households in 51 districts of Nepal which have established over 1800 small industries. Current programs underway will provide service to 90,000 additional households**
- ❑ **Under the 20:80 Program, over 1 billion rupees deposited by rural Nepalis so far.**
- ❑ **Since 2068/69 FY, 20:80 program replaced by 10:90 program after the fiasco of “socialist” and “Maoist” opposition**

# PLURALIZING NEPAL'S POWER SYSTEM











# Cultural Theory of Resources: Abundance, Scarcity or Depletion?

## *Asymmetrical Transactions*

### **FATALISM**

*believes in*

**RESOURCE LOTTERY**

*that produces*

**CLUB GOODS**

*from which they are excluded*

Water as 'mirage' in ads?

### **HIERARCHY**

*argues for*

**RESOURCE SCARCITY**

*to produce*

**PUBLIC GOODS**

Water as regulated 'municipal or utility supply'.

high  
↑  
excludability  
↓  
jointness

low ←

→ high

*Competition Fettered and Accountable*

*Competition Unfettered and Unaccountable*

### **INDIVIDUALISM**

*argues for*

**RESOURCE ABUNDANCE**

*to produce*

**PRIVATE GOODS**

Priced, glamourized bottled or tanker water, individual hand or or motorized pumps.

### **EGALITARIANISM**

*argues against*

**RESOURCE DEPLETION**

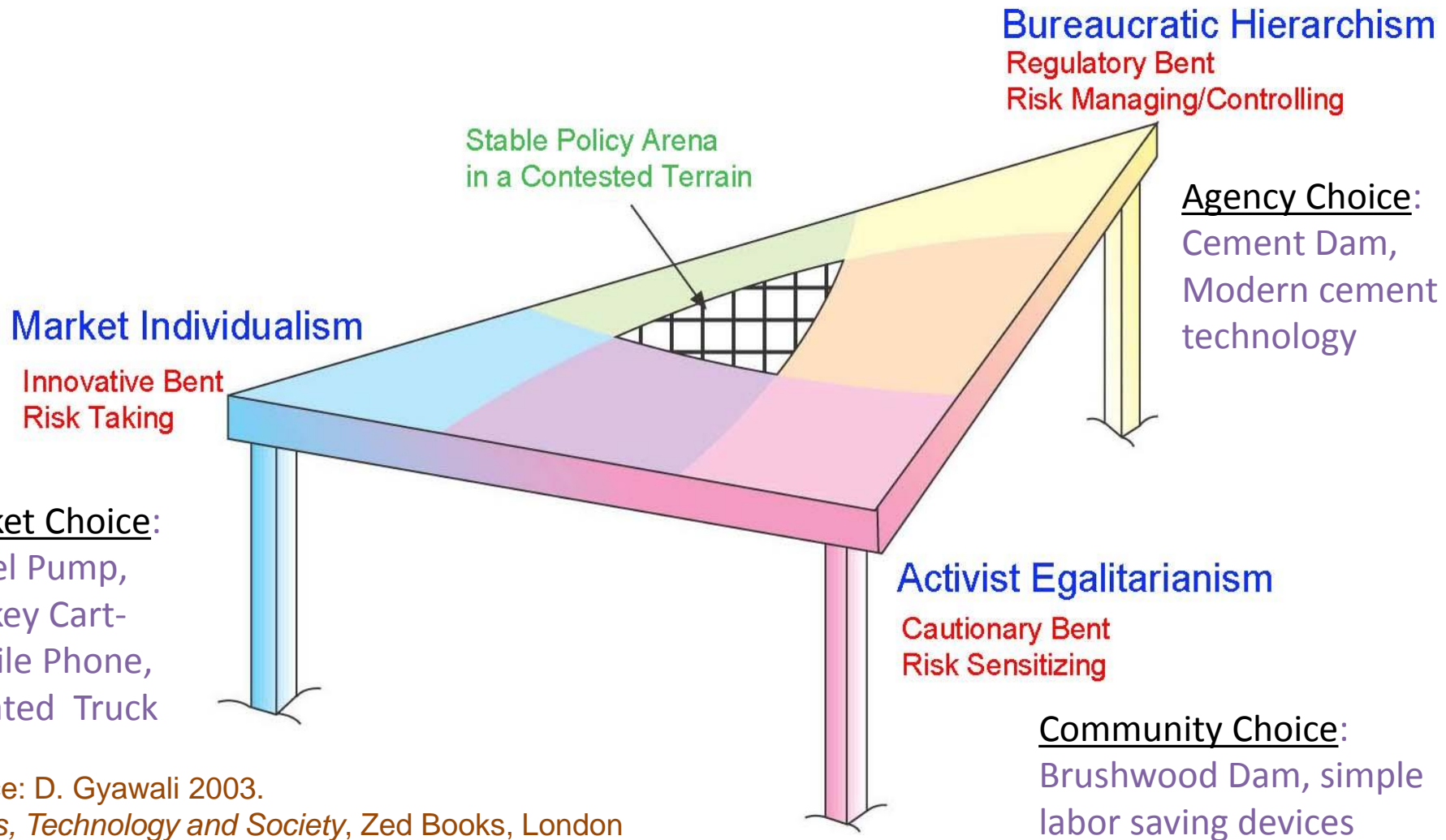
*to produce*

**COMMON-POOL GOODS**

Accessible to all, 'common pool' Water.

## *Symmetrical Transactions*

# Constructive Engagement of Plural Social Solidarities



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

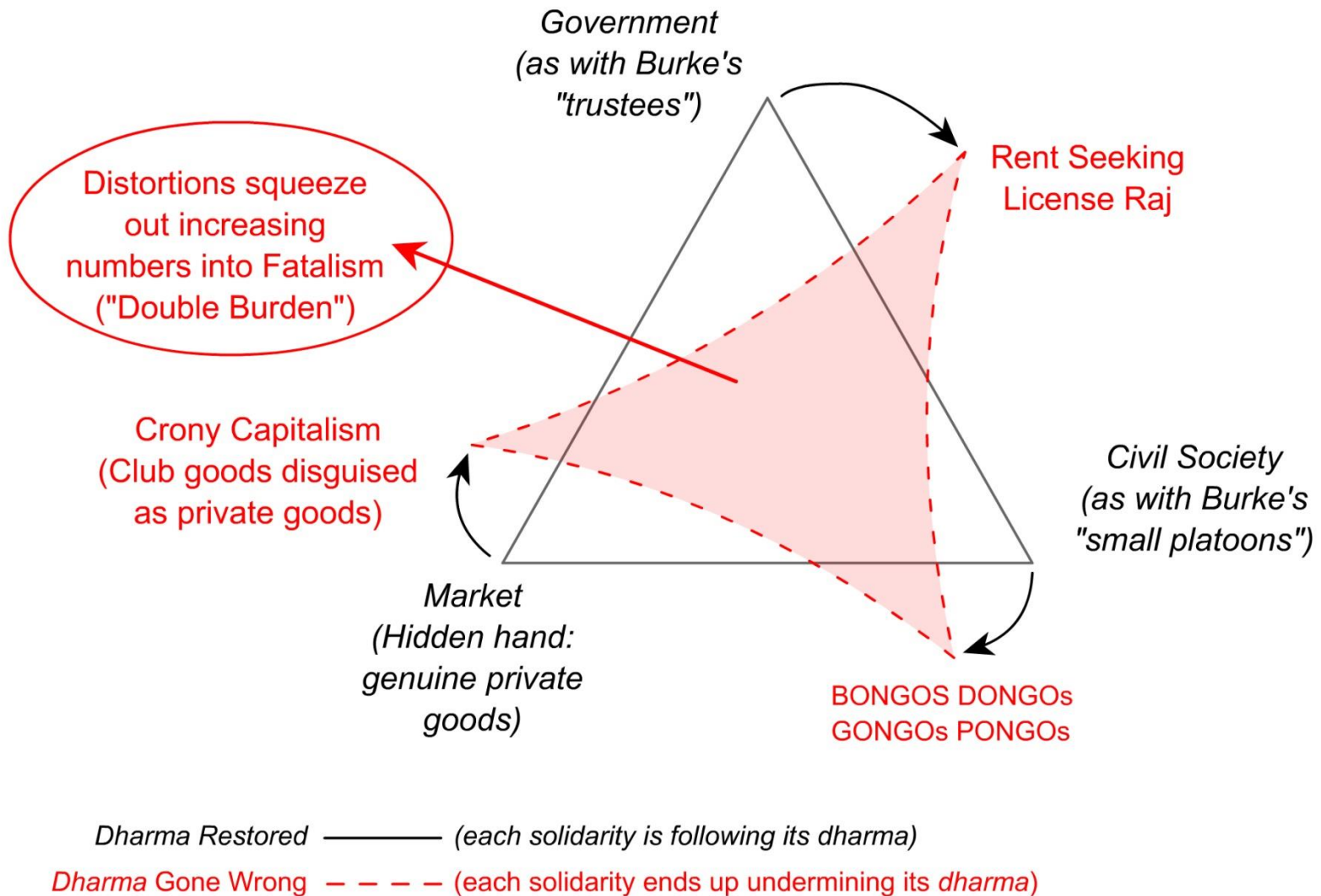


Figure : 1.1 *Dharma* and its dynamics

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