

India's Water Sector

The Performance &

The Challenges

India is a blessed country

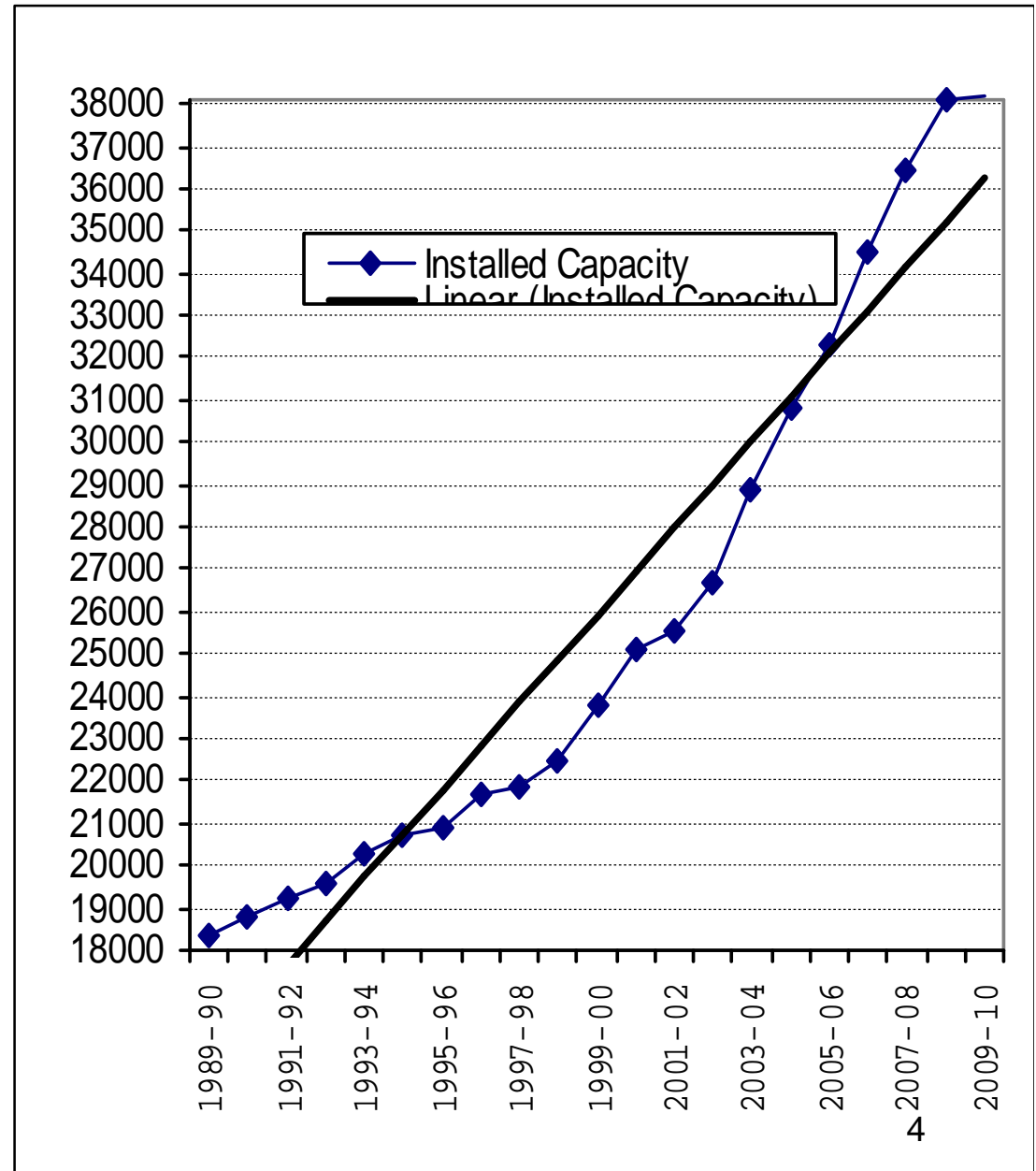
- Large no of big, perennial rivers and many other seasonal streams
- Fed by the bounty of monsoon, the glaciers and forested catchments
- Rich, diversified tradition of Water harvesting and conservation techniques
- And also of management systems.
- Abundant, decentralised groundwater aquifers

The Dam domination in India's WRD

- 346 large dams in 1950: 5100+ now
- 66-80% of water sector budget goes for big projects – also in the 11th Five Year plan (2007-12)
- No credible assessment of performance of large dams
- To the exclusion of Rainfed farmers, local water systems or groundwater recharging or repair and maintenance of created infrastructure, future generations
- As if people and ecosystems do not matter
- New ways are being attempted to push big projects: ILR, food security, flood control, AIBP, National Projects, advocacy to increase storage capacities, clean (hydro) energy, climate change, China bogey₃

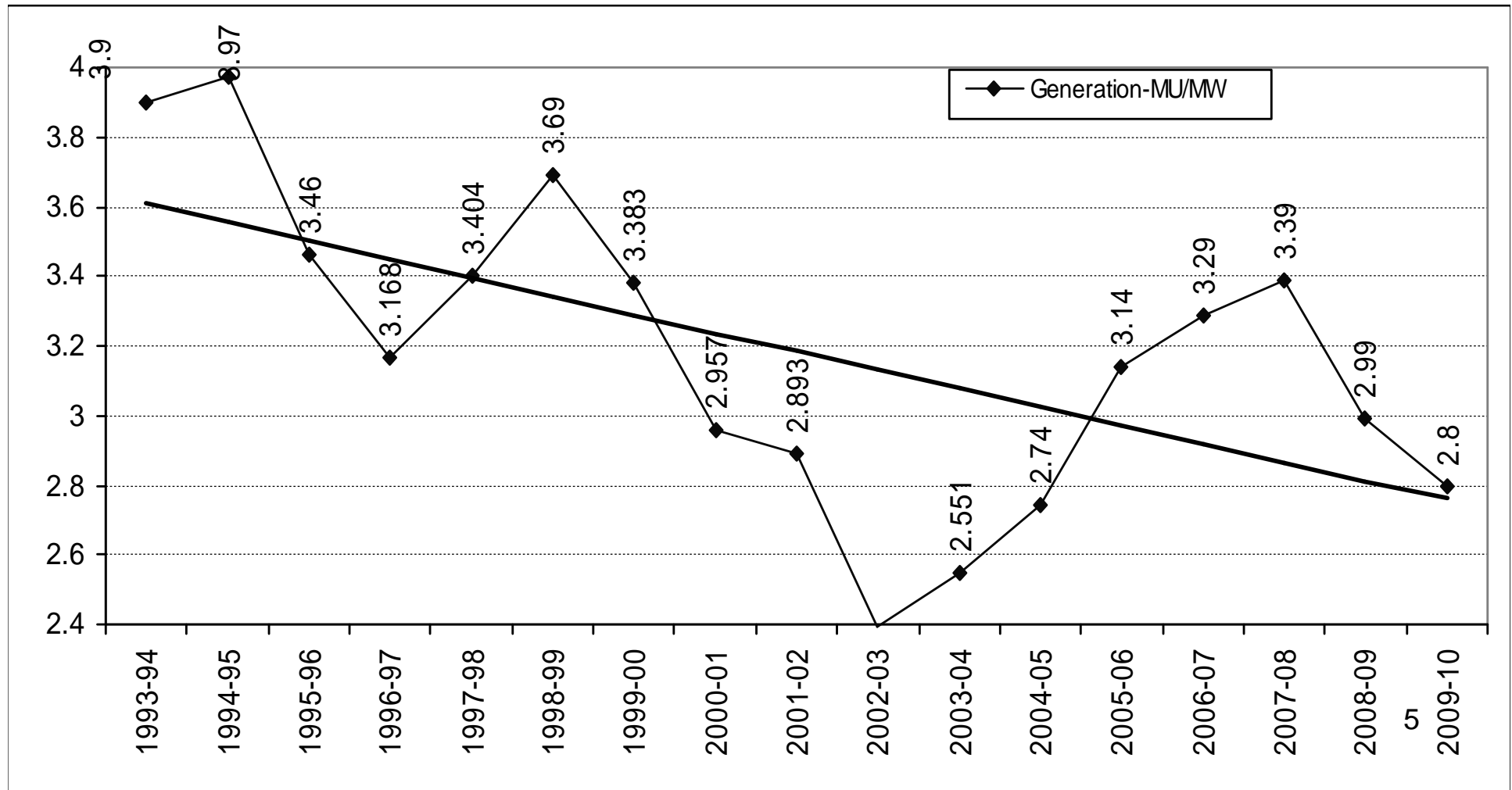
Advocacy for large hydro

- There is strong push for large hydro projects today, as if large hydro projects are good in themselves.
- In fact installed capacity of large hydro has increased at the highest compound growth rate among all power sub-sectors.
- There is little attempt for credible assessment of performance of large hydro. How have they performed?



Diminishing Returns from Large Hydro

- As can be seen from the chart here, the Million Units energy generated from large hydro projects has been almost continuously falling over the last sixteen years.
- The fall from 1994-5 to 2009-10 is massive 29.47%.
- There are many reasons for this: unviable projects, over development, optimistic assumptions, siltation, inadequate R&M, ROR projects, etc.



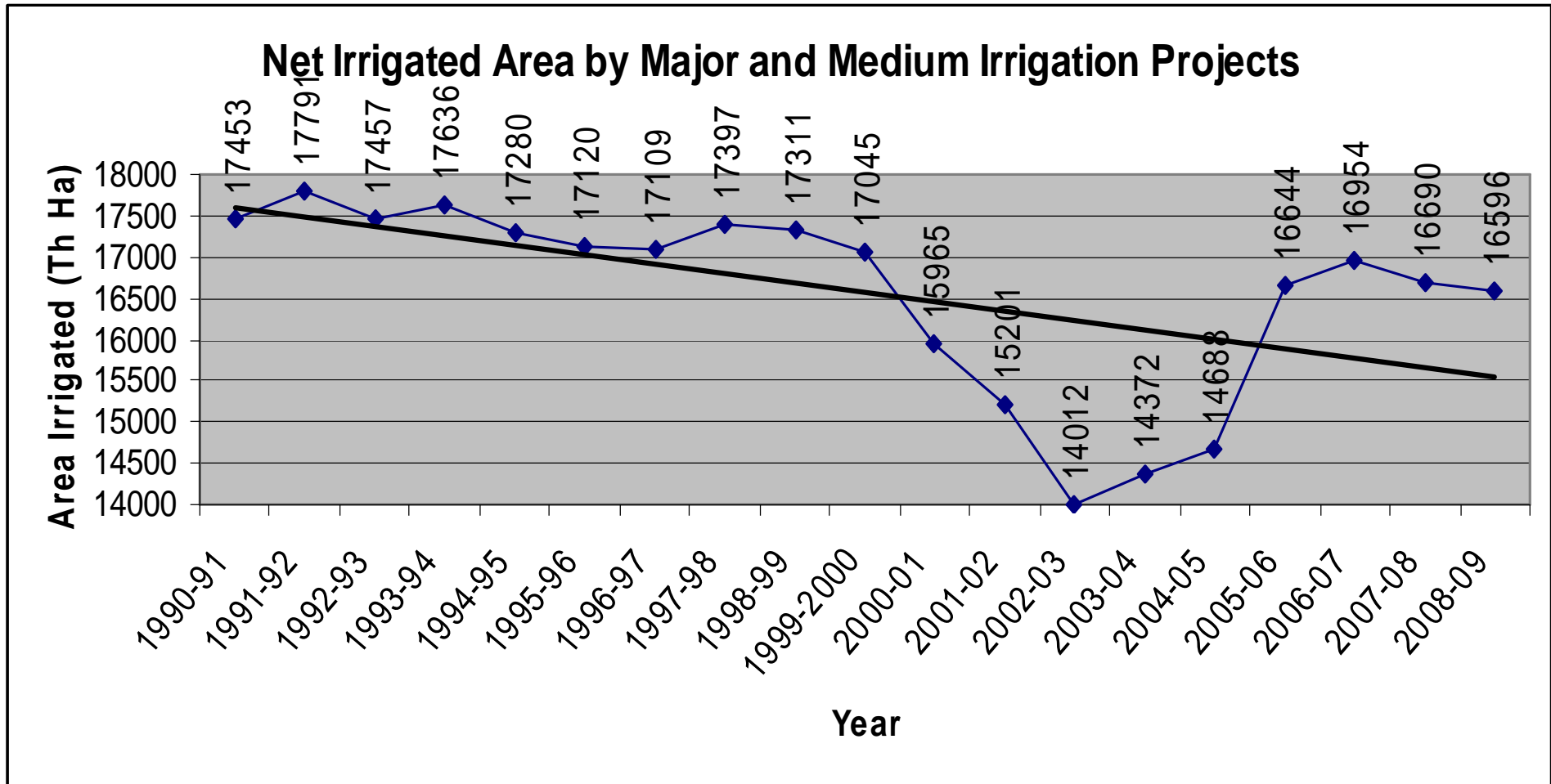
89% of projects generate at below design capacity

- When a project is given techno-economic clearance, it is based on promise that it will generate certain units of power at 90% dependability level
- Our analysis of all the operating hydropower projects of India show that 89% of the projects generate at **BELOW** the design capacity.
- In fact 50% of the under-performing projects generate at below the 50% of design energy.
- And yet no questions are asked, no accountability fixed, in fact such an analysis is not even done.
- This means that a lot of the projects that are being set up now are **UNVIABLE** projects.

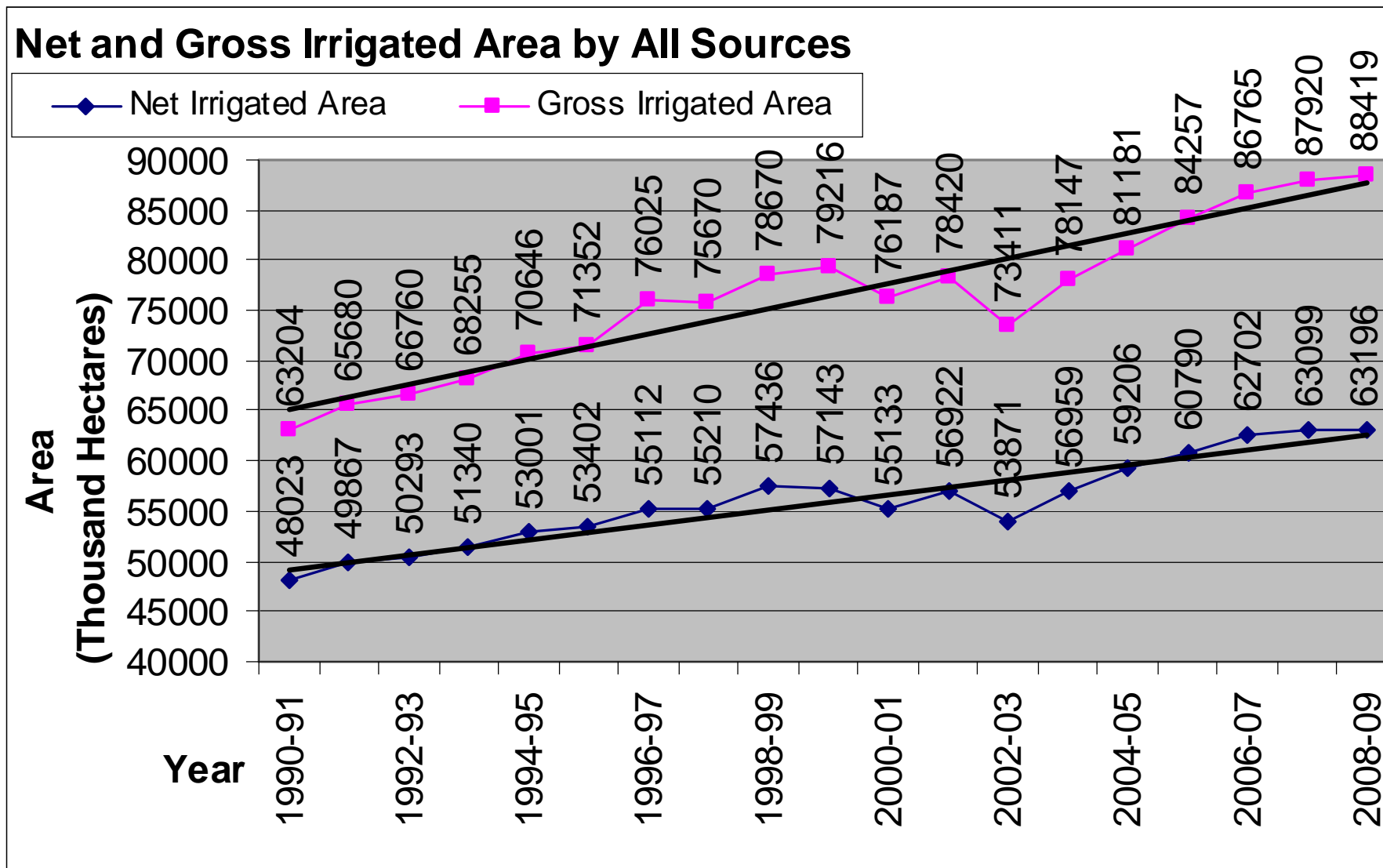
Are HEPs providing peaking power?

- One of the most important justifications put forward for taking up hydro projects is that they can provide peaking power, unlike the coal and nuclear power projects.
- An important question then is, how much of the power generated by Hydro projects is available during peaking hours? Unfortunately, such an analysis is not being done currently. This is shocking since, this means that we do not even know if the hydro projects are delivering what they have been built for.
- We are unable to do such an analysis since it requires a lot of data which is not easily available.
- However, anecdotal evidence suggests that indeed a large number of hydro projects are performing as base load stations when they can provide peaking power.
- For example, the Central Electricity Regulatory Commission has noted that projects like Nathpa Jhakri (1500 MW) and Tehri (1000 MW), that were not generating peaking power when they could.
- The peaking power generation capacity of Giri Bata Hydro project is being destroyed by putting up the Renuka dam for supplying water to Delhi.
- A large number of ROR hydro projects cannot even claim to be in a position to generate peaking power, since they are so situated along the river that the downstream projects often get water only during off peak hours. This would very much be the case in Sutlej, Ravi, Beas, Chenab, Bhagirathi, Alaknanda, Narmada, Krishna, Cauvery, Chalakudy and Teesta basins. 7

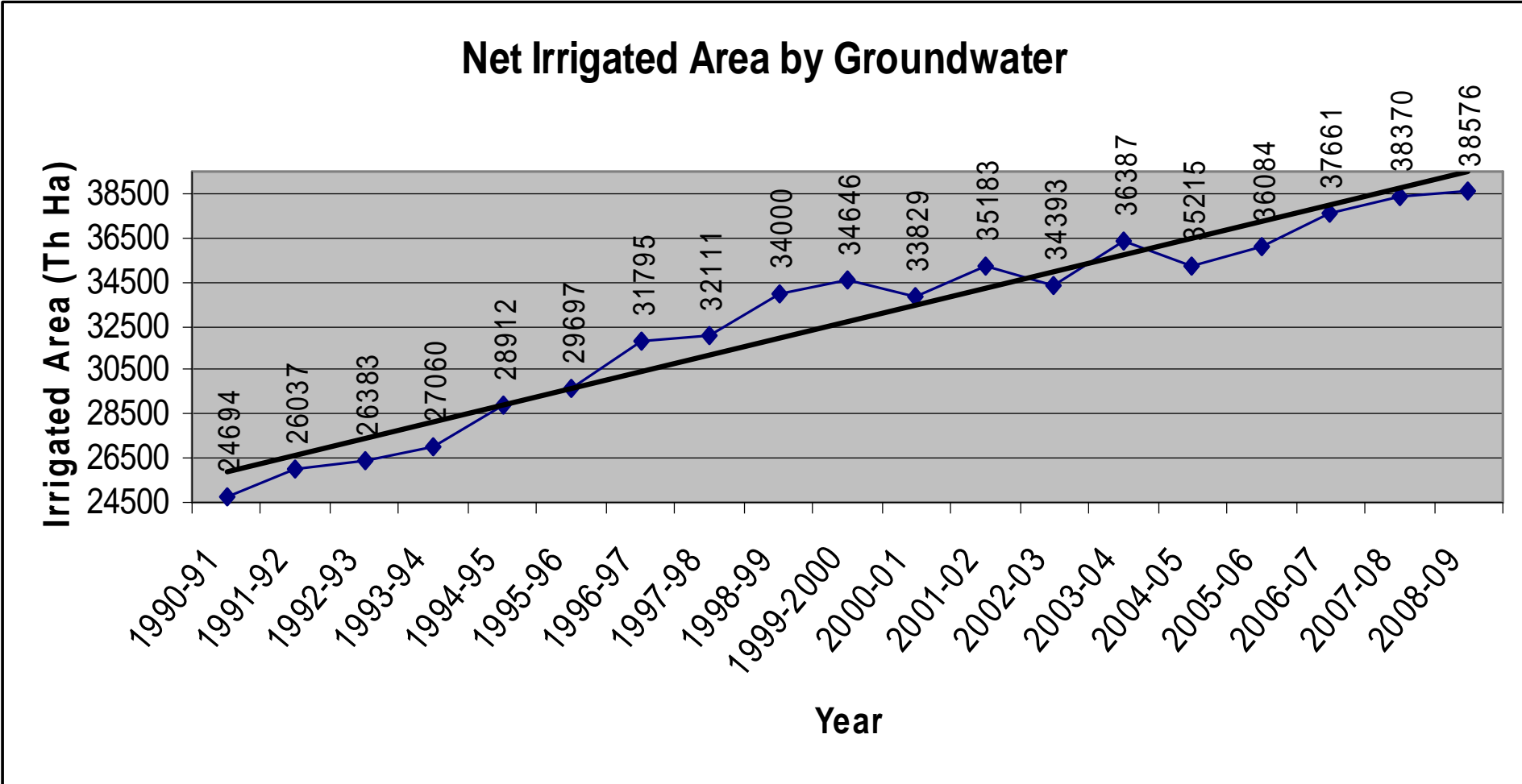
In 17 years between 1991-92 to 2008-09, after spending over Rs 150000 crores on big irrigation projects, there is decline of over 1.2 M ha in canal irrigated areas



In these 17 years (1991-92 to 2008-09), India's net & gross irrigated areas steadily gone up. How was that possible?



The increase in overall irrigated area, in spite of decrease in contribution from big dam irrigation projects was possible due to the steep increase in groundwater irrigated areas.



The Reality about the Agricultural Growth

- Agriculture growth rate in 8th FYP (1992-97) was 4.72%, in 9th FYP (1997-2002): 2.44%, in 10th FYP (2002-7): 2.13%. In 1st four years of 11th FYP (2007-12): 4.7, 1.6, 0.2, 5.4%.
- These growth figures hide the realities of stagnating yields. For example, even though it is claimed that there was positive growth in 2009-10 and 2010-11, the national production of most agricultural items in both these years is below the levels achieved in 2008-09.
- Whatever, growth we have seen in last two decades can be entirely attributed to increasing groundwater use. This is clearly unsustainable, as is clear from many studies, including the 2010 NASA study.

Official agencies accept this reality, but continue to pour resources into leaking buckets.

- Mid Term Appraisal of the 11th FYP: “What is truly incredible is that during the years in which the AIBP has been implemented, net irrigated area through canals has actually undergone an absolute decline, rather than achieving an accelerated growth. From an average contribution to NIA of around 17.5 m ha in the mid-1990s, area irrigated by canals has come down to less than 15 m ha in the first decade of the 21st century.”
- The CAG report (2010-11): Confirms the worst fears: At least 65% of the AIBP projects claimed to have been completed are not complete or commissioned.
- The Public Accounts Committee has now (Feb 2011) demanded major overhaul of the scheme including independent monitoring.
- India’s Finance Minister increased the allocation for AIBP in his budget yesterday!

Big Dams help Control Floods?

- The dams already constructed can be of some limited help provided there is transparent, accountable reservoir operation policy. There is none today.
- Wrong operation of large dams have actually led to disastrous floods: Ukai (2006), Hirakud, Chandil, Ranganadi (2008), Srisaillam, Upper Krishna, Tungbhadra & Nagarjunsagar and also Damodar dams (2009), Bhakra, Pong and Tehri (2010) in recent times
- No engineer/ bureaucrat or minister has ever been punished for wrong operation of dams
- If flood management is the objective, dams are not a viable or desirable proposition.
- Embankment similar story, e.g. Kosi (2008)

Advocacy for more storage capacity

- Firstly, storage capacity can be both above the ground and also sub surface.
- India's water lifeline being ground water, and the fact that ground water levels are depleting fast, it may help to use the sub surface space so created to store more monsoon water.
- Secondly, regarding the above surface water storage capacity, we need to ensure that the capacity that we have already created is protected and optimally used. We are doing neither.
- Thirdly, even for additional capacities, we need to first exhaust the options of local storage capacity potential and also sub surface storage potential.

Implications of empty storage capacity

- On an average, each year about 34.41 BCM (equivalent of 6 Sardar Sarovar Projects) of storage capacity out of only the monitored storage capacity is not filled up for the last 15 years.
- That means that on an average an investment of Rs 34886 crores has remained idle in each of the last 15 years.
- This happens when in 10 of the 15 years the rainfall was almost average or above.
- Should we not be trying to understand why this is happening? How we can make the existing storage capacity play the useful role it is supposed to, in stead of pushing for more storages? .

Water Storages are silting up fast

- As per the report of NCIWRD (Govt of India, Sept 1999), about 1.4 BCM of existing storage capacity is getting silted up every year.
- At today's rates creation of 1.4 BCM storage capacity would cost Rs 1448 crores.
- Our calculations, based on CWC reports of siltation for 27 dams, show the loss is at 1.95 BCM per year. India is creating about 3 BCM storage capacity every year.
- That means that on an average, each day we are losing Rs 4 crores worth of storage capacity through siltation.
- And there is little serious attempt to stop this.
- The required Catchment Area Treatment for even Bhakra was not done. Same for other projects

Increased demands from Cities & industries

- Urban Populations and per capita demands are going up. Demand for water for industries is also going up. These are increasingly taking away the water from rural areas and agriculture.
- About 55% of all urban and industrial water comes from groundwater and that proportion is increasing, depleting the groundwater levels fast.
- Such increased water use in cities and industries is also polluting the freshwater sources. Land acquisition for them is also destroying freshwater and groundwater recharge zones.
- There is urgent need to push for reforms to make the urban and industrial water sectors more transparent, accountable and participatory. In stead of addressing this, push for privatisation is bound to worsen the situation and create greater conflicts and opposition.

The hidden costs – who pays them - 1

- Total area of India's 4528 large reservoirs: 4.42 m ha
- In 2000, the Planning Commission acknowledged about WRD that "25 million persons have been displaced since 1950 on account of development. Less than 50% have been rehabilitated – the rest pauperised by the development process". The actual numbers are more likely to be nearer to 35-40 million and proportion of those rehabilitated much lower.
- Take the case of the 389 cut off villages in Malkangiri that was the scene of the recent abduction of the district collector. Why is the area cut off? Why that area, cut off for a hydropower station, does not have power or other basic amenities? Why has the reservoir created for development has created so many problems for the tribals and others in the area? Where are the benefits of the dam going and who are suffering the costs of the "development"?

The hidden costs – who pays them - 2

- Decades after the celebrated Bhakra dam was completed, in early 1970s the then Union Irrigation Minister KL Rao visited the dam. He has recorded that episode in his autobiography *Cusecs Candidate: Memoirs of an Engineer*. “it is curious how we handle our projects. The village of Bhakra on the bank of the river Sutlej was submerged. The Dam resulted in great suffering to the people of the village, but nobody took note of the people’s representations. I found that the new village of Bhakra had neither drinking water nor electricity though surrounded by blazing brilliant lights. This was indeed unfair.”
- The BBMB officials told the Minister Rao that they did not have budget for providing these facilities to the dam displaced people. The story is not much different for other large dams. The millions of displaced are mostly the poor, disproportionately the tribals and scheduled castes. And they almost never get any benefits of the development.

Non existent Environment Compliance: Karcham Wangtoo Project, muck being dumped in Sutlej river, Himachal Pradesh



Non existent Environment compliance: Muck dumping in Rampur Project, Sutlej river, Himachal Pradesh



Dump next to habitation Averi, Rampur Project



Dump next to Primary School Averri



Hydro projects also dry up the rivers: Nathpa Jakhri in HP



Hydro projects also dry up the perennial rivers: Baspa in HP

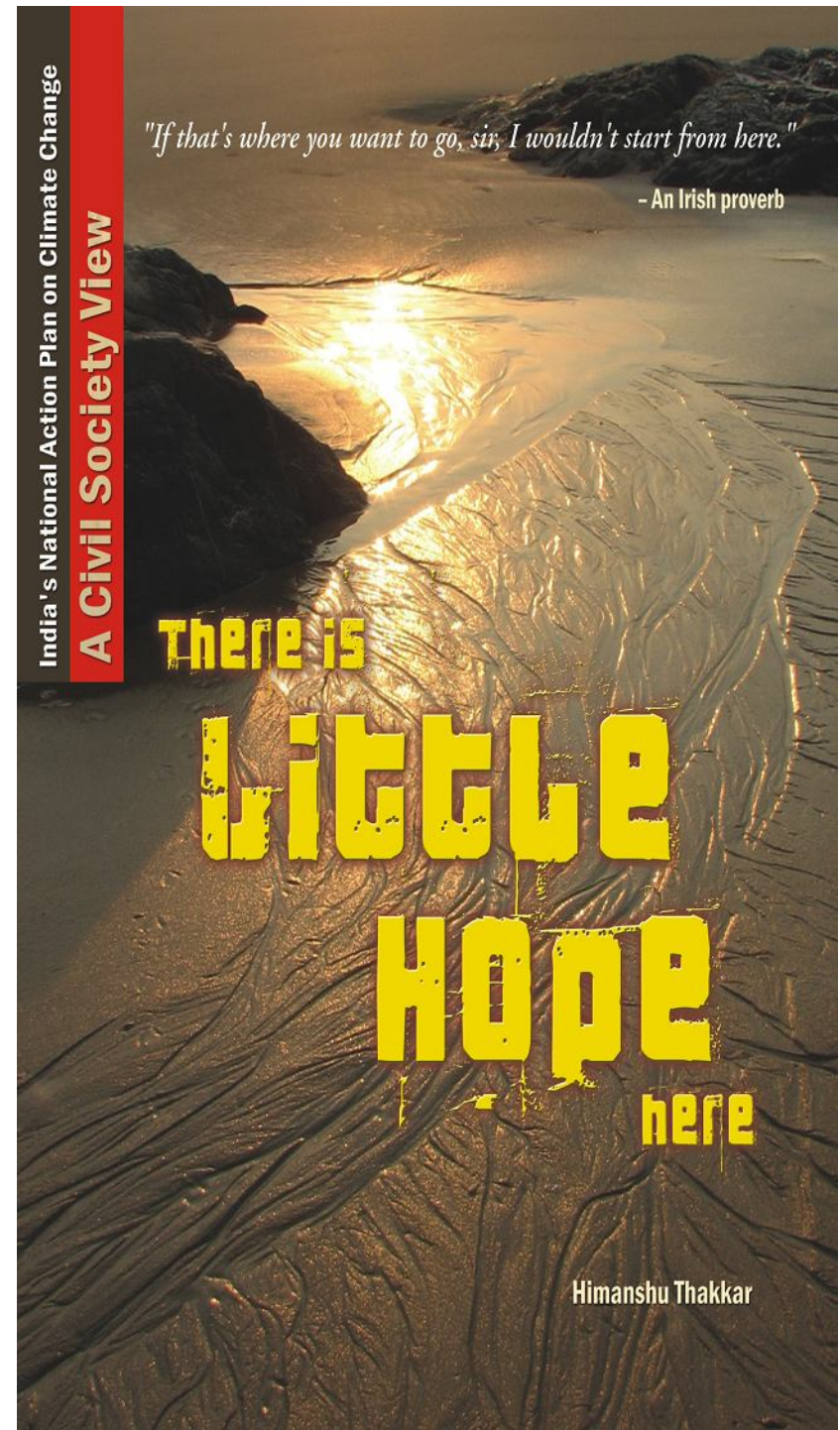


Large Dams also contribute to **Global Warming**

- Scientific studies published in research journals show that large dams emit significant amounts of methane, which is 21 TIMES more powerful than CO₂ in global warming.
- Methane is emitted from reservoir area, from spillways, from turbines and from downstream rivers.
- Indian large dams, even by conservative estimates, emit 17 million tons methane a year, which is equal to emission of 357 MT of CO₂.
- This is about 18% of India's TOTAL official emission of 1889 MT in 2000; or almost same as the total power sector emission of India in 2004-05.
- Indian govt does not measure methane emission from large dams, even as planning commission has been asking for it for the last 7-8 years.
- The proposed 3000 MW Dibang HEP in Arunachal Pradesh, for example, even by conservative estimates, would emit at least 3.3 Mln T CO₂ equivalent methane every year.
- Tipaimukh: GHG emissions to be studied after the clearance
- Env Minister J Ramesh accepts the problem but says they do not have methodology or expertise to assess methane emission from reservoirs!

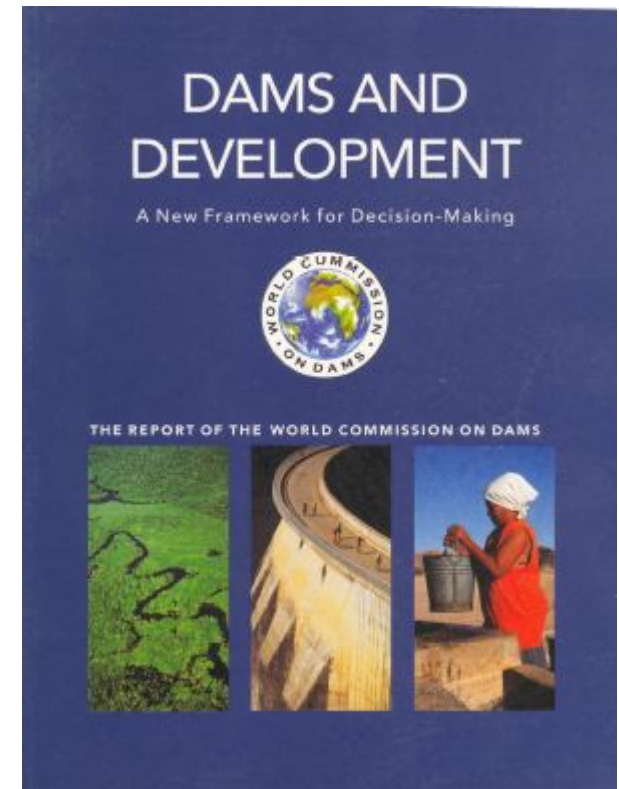
Climate Change, India and NAPCC

- Climate change will worsen India's water, power and droughts-floods situation.
- India is more vulnerable to climate change than US, Europe or China
- Within India, poor people, rural population, coastal population, tribal population are most vulnerable.
- India's NAPCC is mostly blind to this reality.
- It has no place for these people in its plans, in missions, in visions or even in its formulation.
- False solutions in water sector



Is there hope for the future?

- Yes, if there is will:
- Report of the World Commission on Dams: The report was a result of an exercise in which majority of commissioners were supporters of large projects. This was the first ever & most transparent, open, inclusive process to assess the development effectiveness of large dams and it came out with a unanimous report in November 2000. The Report offers a framework for decision making process on Large projects and options.



Better Options Exist – 1

- There are several success stories in India where the improved decision making through multi-stakeholder planning processes on water services have delivered sustainable solutions rather than trade offs.
- It is possible to cater to the justifiable demands of the people over large areas spanning over several districts, through a network of hundreds of small projects.
- These projects have much more equitable, sustainable benefits and there could be unexpected spin off benefits, as against unexpected, spin off losses in large dams. (e.g. Groundwater levels go up, sometimes the seasonal rivers become perennial)
- These projects can also help evolution of institutional mechanism for better decision making and management.
- These provide real option for people to earn decent livelihood in sustainable way, without involving toxic, de-humanising dreams.

Better Options Exist – 2

- In a German Govt (KFW) supported effort in Vidarbha (Maharashtra), Participatory Irrigation Development and Management (PIDM) and Not PIM (where there is no participation at the planning, decision making or development stages) lead to remarkable transformation of 28 villages. Irrigation projects have been planned, constructed and now being managed by the people. People contributed in construction of the project and now they are also collecting the water cess @ Rs 400 to 1500 per ha through WUA and managing the systems spanning over thousands of Ha.
- For details see: <http://www.indianexpress.com/story-print/748651/>

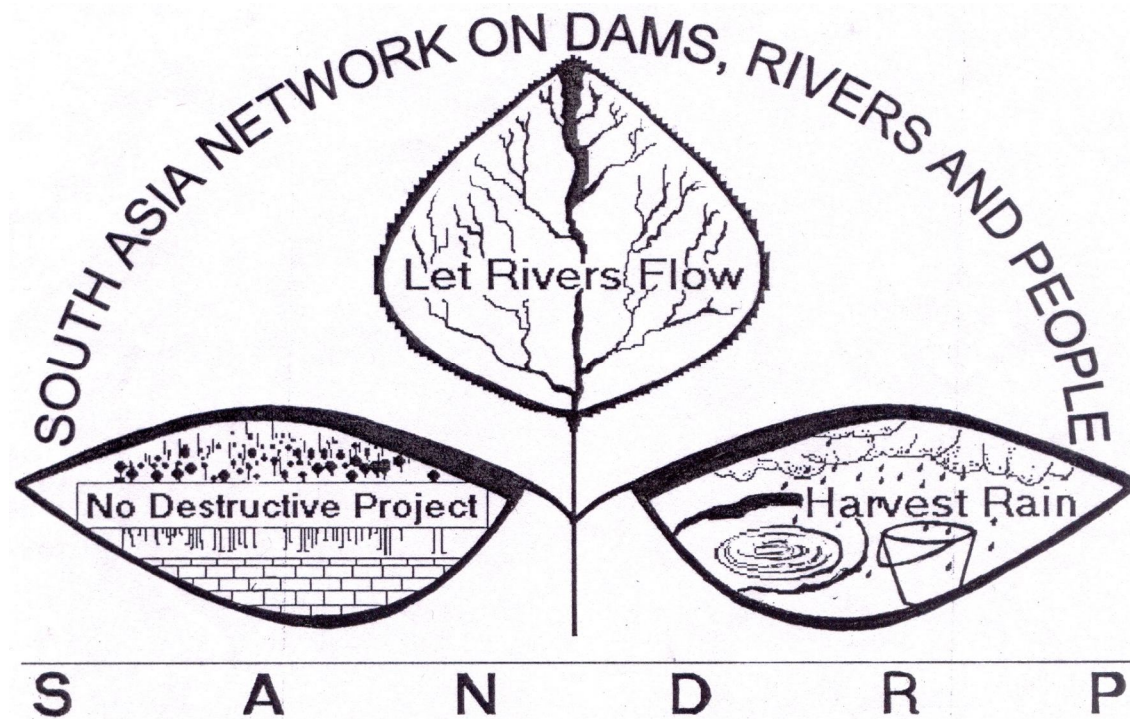
Better Options Exist – 3

- System of Rice Intensification, Organic farming: Proven techniques
- For Example in Bihar: Bihar Rural Livelihoods Promotion Society (BRLPS) under Finance Department-Govt. of Bihar
- SRI: 128 farmers (2007), 5146 (2008), 8367 (2009) and 19911 (2010); crop yields up 200% in 1st two years, 100% in last two (drought – clear signature of climate change) years
- SWI: 415 farmers (2008-09), 25235 farmers (2009-10) 48521 farmers (2010-11) yield 100-150% up
- Also successful attempts in Rapeseed, Mustard, vegetables (tomato, Brinjal, Chillies)

Major challenges

- Ensuring livelihood and food security for two thirds of the population in rural areas depending on agriculture. 60% of cultivable land is rainfed.
- Ensuring optimum benefits from infrastructure already created.
- Ensuring sustainable water lifeline: Groundwater: A. Protection of existing groundwater recharge systems; B. Creating more groundwater recharge systems; C. Decentralised, bottom up groundwater regulation empowered through laws and institutions.
- Climate Change: India will be one of the worst affected and poor, rainfed farmers, tribals, mountain and coastal communities will be the worst victims, through increased frequency and intensity of droughts, floods and increased demands.
- Increased populations, increased demands, increased urbanisation, industrialisation in the era of climate change would mean increased water diversion and increased potential of pollution of remaining freshwater.
- How do we increase TAP in water: TAP = transparency accountability, participation.
- Stronger stand for the people in international climate negotiations
- DEMOCRATIC GOVERNANCE

THANK YOU



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- *Water Issues in India: Opportunities and Challenges*