India's water culture: investing in a degrowth future

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Abstract

Degrowth as a creative goal does not sit well in most societies today. But water is a key to fostering new imaginaries because it most starkly manifests the risk of forced and chaotic degrowth-as-collapse. By 2040 an estimated 33 countries, including USA, China and India, will face severe water scarcity.[1]

India had a rich heritage of elaborate traditional technologies and modes of social organisation that ensured adequate and reliable supply of water even in arid regions. Many of these old community-based systems of watershed management and storage withered away as water was transformed from a sacred gift to just a 'resource' that could be privatised and/or controlled by governments.

Today while local water-shed management is supported by government policy this tends to be overwhelmed by large projects that add more directly to GDP growth. Nevertheless, over the last quarter of a century, a wide variety of civil society and academic interventions in India have attempted to revive, or document, the multi-dimensional wisdom on which pre-modern societies based their relationship to water.

This paper explores:

- surviving community-based water traditions which demonstrate some of the principles of a steady-state economy in action;
- whether such grassroots practices might form the basis of a transition to a degrowth political economy in India and other countries;
- if those who have till now rejected the steady-state approach might be inspired by the example of water, and creative practices in this sector, to redefine their parameters of 'growth';
- what new forms of water commons could be the basis of a **re-growth** future.

[1] Andrew Maddocks, Robert Young, and Paul Reig, 'Ranking the world's most water-stressed countries in 2040', *World Resources Institute*, August 26, 2015. <http://www.wri.org/blog/2015/08/ranking-world%E2%80%99s-most-water-stressed-countries-2040>

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Prologue

"India is a ground water civilisation. For millennia, people have used ingenious and elegant structures to use and replenish water in shallow aquifers, creating a reliable, widespread, cost effective and democratised water infrastructure. We need to build on that knowledge, to ensure that the country's aquifers become a dependable local resource, especially when the monsoons fail."

Rohini Nilekani and Mala Subramaniam[2]

In the winter of 1986, Arun Kumar, a one-time journalist, went on a walk-about in the Thar desert – an arid expanse stretching across north western India and parts of Pakistan. Arun, or Pani-baba (water-sage), as he came to be known, set out to learn about the water habits and lifestyles of communities who had lived in sync with the rhythms of the Thar desert for centuries. Such learning, Pani-baba decided, would only be possible by moving on foot at a pace where the soil, its eco-systems and the people whom the land supported were not a blur – as they are when one drives past them.

I joined Pani-baba on this Pani Yatra (Water March) for one week, walking from the town of Barmer to the ancient trading town of Jaisalmer, Rajasthan. As we walked from village to village we came across scores of structures, built over centuries, to catch and store water from the sparse rain every year – including wells with beautifully carved stone embankments. The existence of these structures explains why an area that has an average rainfall of only 281.8 mm is the most densely populated desert in the world – with about 83 people per sq km.

Jaisalmer once linked the Indian sub-continent with the Silk Road for centuries. That pre-modern international trade route was at all possible to an extent because it was dotted with the kind of ingenious water systems and *sarais* (resting places) found even now around . Jaisalmer.[3]

These traditional water harvesting, and water maximising systems have been closely studied over the last 30 years and now inform some of the water 'management' efforts by civil society and government. But as India rapidly moves from being water-stressed to water-scarce pre-modern approaches to water give rise to complex questions:

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[2] Rohini Nilekani and Mala Subramaniam, 'Revitalise our aquifers: India can be water secure, but for that we need to act urgently' *Times of India*, May 30, 2016, <http://blogs.timesofindia.indiatimes.com/toi-editorials/revitalise-our-aquifers-india-can-be-water-secure-but-for-that-we-need-to-act-urgently/>

[3] 'Groundwater Information: Barmer District', *Government of India, Ministry of Water Resources, Central Ground Water Board*, (2013) <http://www.cgwb.gov.in/District_Profile/Rajasthan/Barmer.pdf>

- were the varied traditional water systems built on principles that can be the basis of a steady-state economy in the 21st century?
- what can we learn from both the traditional practices and their contemporary versions that might facilitate the transition to a degrowth--or **re-growth**--political economy in India and elsewhere?
- what new forms of water commons could be the basis of a re-growth future?

This paper will first review the magnitude of the water crisis, then examine the possibilities raised by traditional water systems before looking at solutions and framing issues for a water-degrowth discourse.

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Water in crisis

More than any other dimension of society, economy and ecology water manifests the basic premise of the degrowth discourse: unless degrowth rapidly becomes a plan or a strategy, it will be forced upon societies across the world due to a combination of turmoil in prevailing economic models and collapsing ecosystems.

Over 97% of water on this planet is not fit for human use since it is salt water. Fresh water sources are already so scarce and/or polluted that globally, an estimated two million people die every year from a lack of safe drinking water.[4]

Human consumption of water has been growing globally at twice the rate of population increase over the last 100 years. The Food and Agriculture Organisation (FAO) estimates that by 2025, 1.8 billion people will be living in countries or regions with 'absolute' water scarcity – that means less than 500 cubic meters per year per capita. As much as two-thirds of the world's population is likely to live in water 'stress' conditions – that is with water availability of 500 and 1,000 cubic meters per year per capita.

These conditions are expected to further worsen as urbanisation increases.[5] If business as usual continues, by 2030 demand for water is expected to exceed viable resources by 40%.[6]

[4]Roger Harrabin, '"River man of India" bags tops prize', *BBC News*, March 21, 2015, <http://www.bbc.com/news/science-environment-32002306>

[5] FAO Water, 'Water scarcity', *UN Food and Agriculture Organisation Website*, Last accessed September 22, 2016, < http://www.fao.org/nr/water/topics_scarcity.html>

[6] Martin Stuchtey, 'Rethinking the water cycle', *McKinsey*, May 2015, <http://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/rethinking-the-water-cycle>

The United Kingdom, one of the rainiest places in the world, is already resorting to desalination plants.[7]

Across the world private companies are coming under increasing pressure on the issue of water. In May 2015 Nestle faced protests at its water bottling plants in California when the state was reeling under the fourth consecutive year of drought and local people lacked sufficient water.[8]

The World Bank estimates that water scarcity will be further exacerbated by climate change, and by 2050 this could cause a 6% decline in the GDP of some countries. This, the bank warns, could spur migration and spark conflict as food prices spike due to drought-caused food shortages. Episodes of droughts and floods have already generated waves of migration and a rise in violence within countries.[9]

Asia is the veritable epicentre of this accelerating water crisis. The per capita availability of fresh water in Asia is 2,816 cubic meters, less than half the global average of 6,079 cubic meters.[10] In India 32% of total land is already on the brink of desertification and another 25 percent is undergoing accelerated desertification.[11] This has dire implications for productivity and the livelihoods and food security of millions.[12]

Additionally, there is the spectre of hotter temperatures due to climate change. The summers of 2015 and 2016 were the hottest ever recorded in India.

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[7] The Institution of Chemical Engineers (IChemE) is predicting that desalination plants could become more common on UK coastlines and estuaries by 2050 as population growth and the effects of climate change places increasing pressure on water supplies. IChemE, 'Water challenges make UK desalination plants more likely', *IChemE* Website, September 11, 2013, <http://www.icheme.org/media_centre/news/2013/water-challenges-make-uk-desalination-plants-more-likely.aspx#.V4iJR7h96M9>

[8] Rose Hackman, 'Nestle bottled water operations spark protests amid California drought', *The Guardian*, May 20, 2015, <https://www.theguardian.com/us-news/2015/may/20/nestle-water-bottling-california-drought>

[9] Water Global Practice, 'High and Dry: Climate Change, Water, and the Economy', *World Bank Group*, 2016 <http://www.worldbank.org/en/topic/water/publication/high-and-dry-climate-change-water-and-the-economy>

[10] Brahma Chellaney, 'Asia's troubled water', *Project Syndicate*, April 22, 2016, <https://www.project-syndicate.org/commentary/mekong-dams-impact-on-asian-water-supply-by-brahma-chellaney-2016-04>

[11] According to the United Nations Convention to Combat Desertification (1994), desertification is defined as '*land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variation and human activity'*. The WOTR Blog, 'Combating desertification through community stewardship', *Watershed Organisation Trust*, June 17, 2016, <https://thewotrblog.wordpress.com/2016/06/17/combating-desertification-through-community-stewardship/>

[12] ibid.

Per capita availability of fresh water has declined sharply from 3,000 cubic metres in 1965 to 1,123 cubic metres in 2015.[13]

India now draws more groundwater per annum than the US and China combined with approximately 30 million, mostly private, wells in operation. Groundwater supplies about 70% of water for agriculture, industry and domestic use: this is unsustainable over-extraction.[14]

While this data is disturbing enough here are some snapshots that convey the magnitude of the crisis:

- In March 2016 farmers in Chikballapur, near Bangalore, blocked the main highways to protest against shortages of water that had come about partly because, for several decades, ground water was being extracted at a much higher rate than it was being replenished by annual rainfall. As experts at the Ashoka Trust for Research in Ecology and Environment (ATREE) point out: "If we 'run out' of groundwater, millions of people will be left without any means to sustain themselves."[15]
- In May 2016 the local administration in two small towns of the state of Madhya Pradesh banned the use of motor pumps to draw water and using water for any purpose other than drinking and essential domestic use, such as bathing, cleaning utensils and washing clothes.[16]
- Some of India's rivers have always run dry in summer, but now, some perennial rivers have become seasonal. This is also happening in parts of Maharashtra that still have an annual average rainfall of 2,000 mm. This is because of large-scale damming and a host of other activities along the course and basins of these rivers.

- In the state of Maharashtra 65% of irrigation is based on drawing groundwater, which is now running low. In April 2016, when the state government banned borewells

[13] Prabhat Singh, '6 charts that explains India's water crisis', *Livemint*, April 28, 2015, <http://www.livemint.com/Opinion/97fuaF2aQkO9IjPiPAjMyL/Six-charts-that-explain-Indias-water-crisis.html>

[14] Rohini Nilekani and Mala Subramaniam, 'Revitalise our aquifers'.

[15] Veena Srinivasan and Sharachchandra Lele, 'Why we must have water budgets', *The Hindu*, March 29, 2016, <http://www.thehindu.com/opinion/columns/why-we-must-have-water-budgets/article8406196.ece>

[16] Amarjeet Singh, 'Drought forces Sec-144 in MP town, use of water restricted to domestic purposes', *Times of* India, June 6, 2016, <http://timesofindia.indiatimes.com/india/Drought-forces-Sec-144-in-MP-town-use-of-water-restricted-to-domestic-purposes/articleshow/52624428.cms>

deeper than 61 metres or 200 feet, experts noted that the ban had come three decades too late.[17]

The conventional response to this crisis is perhaps best encapsulated by the World Bank. It outlined possible solutions as part of its report, predicting that if left unsolved, the water crisis would eat into GDP growth in the coming decades. The Bank called for:

- policies that ensured better water resource management.
- adopting incentives to improve water stewardship, for example, more water-efficient agricultural practices
- investments in infrastructure for more secure water supplies and availability.[18]

By contrast a 'degrowth' approach would first deconstruct the nature, form and causalities of GDP growth and then, accordingly, frame solutions for the accelerating water crisis. What, in this context, is the significance and contemporary relevance of traditional water systems? Were these indeed examples of steady-state economies?

This paper draws on the definition of steady-state economy by Herman Daly, widely acknowledged as the father of ecological economics: "An economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low rates of maintenance 'throughput', that is, by the lowest feasible flows of matter and energy from the first stage of production to the last stage of consumption."[19]

Traditional systems and progress

"Traditional systems were often conceptualised for permanence. Inscriptions at temple water tanks would start with '…as long as Sun and moon rise in their respective places'. Population pressures, leading to zero opportunities, coupled with democratic aspirations to be free of exploitative hierarchical social structures drove people to get out of such systems. The hope of modern technologies promising freedom and upward mobility has been the major drive in people accepting unsustainable technologies." -- Uma Shankari

It would be erroneous to apply a concept, namely steady-state economy, retrospectively to the material arrangements formed by societies centuries ago. This is partly because ethics, economic relations, culture, religion and cosmology overlapped inextricably in ways that is not easily deciphered by modern knowledge systems.

[17] P. Sainath, 'Source of the rivers, scams of the rulers', *Rural India Online*, May 25, 2016, <https://ruralindiaonline.org/articles/source-of-the-rivers-scams-of-the-rulers/>

[18] http://www.worldbank.org/en/topic/water/publication/high-and-dry-climate-change-water-and-the-economy

[19] Centre for the Advancement of the Steady State Economy, 'Definition', *CASSE Website*, Last accessed September 22, 2016, < http://steadystate.org/discover/definition/>

Even more significantly, the traditional systems seem incompatible with the notion of 'progress'. For instance, traditional water systems are dismissed by some on the grounds that they could support only subsistence economies and were not conducive to 'growth'. Besides, most traditional systems, certainly those in India, functioned through caste and other hierarchies that are unacceptable today.

However, this scepticism is blind to the most important dimension of the old systems--that they falsify a basic assumption of modern market economics. Dire water scarcity led not to fierce competition over an essential resource of life, but the most intense and creative forms of cooperation. This facilitated the accumulation of scientific knowledge over generations and consequently produced three-dimensional innovations that simultaneously:

sustained natural ecosystems
fostered supporting social beliefs and behaviour patterns, and
gave rise to technical skills for catching, storing and sharing water.

All of the above was done without depending on the individual profit motive, whether in cash or kind. In a nutshell, homo economicus was conspicuously absent in these settings.

So what is the relevance of the traditional systems when homo economicus is very much in evidence in the form of rising aspirations for consuming more goods and services? Plus, with the sharp rise in population over the last century, the people to land-plus-water ratio is vastly different.

Contemporary experience offers a vivid counterpoint to this scepticism. Successive years of drought in India have had the worst impact on precisely those states that receive the most rainfall and have the largest modern infrastructures, like dams and canals. In some cases, for example, the states of Punjab and Haryana, there are bitter disputes about sharing water via canals even though both states are, in 2016, ruled by the same political party.

By contrast, Jaisalmer district, after receiving scarcely 11 mm of rain in 2014 and 51 mm in 2015, has villages where there is no scarcity of drinking water, fodder or food grains--at least in those villages that have maintained or revived their traditional water systems.[20]

Anupam Mishra, perhaps the most intrepid and rigorous documenter of traditional water systems in India, emphasises that the water wonders around Jaisalmer are due to a unique

[20] 'Let this be the last photo-op for drought', *Civil Society Online Interviews*, Last Accessed September 22, 2016, <http://www.civilsocietyonline.com/interviews/the-monsoon-has-the-last-laugh-it-gives-us-rain-we-dont-capture-it/#.VyUBSP_WIVs.mailto>. For more information on the traditional Khadin agricultural system, which allows farmers to maximise scarce water for irrigation see: Deeptangan Pant, 'How farmers in Jaisalmer are using traditional 'khadin' agriculture to beat the heat', *The Alternative*, January 21, 2015, <http://www.thealternative.in/society/how-farmers-in-jaisalmer-are-using-traditional-khadin-agriculture-to-beat-the-heat/>

geography. Much of western Rajasthan has vast stretches of gypsum just below the surface sand. The gypsum traps moisture, preventing it from either evaporating or mingling with saline water below. Over centuries the local people learnt how to make the most of this gypsum belt by building structures that could tap the fresh water it traps. Mishra's books have documented how people have nurtured traditions for the construction and care of water tanks, catchments and underground sources. Care is taken to ensure that catchment areas are kept clean and free from garbage, cow dung and animal droppings. This ensures that drinking water is not contaminated.

A TED talk by Mishra brought together a dazzling collection of images and information about traditional water harvesting and storage systems in the arid stretches of Rajasthan. Nestled inside Mishra's narrative about technological ingenuity, are deep insights about life, purpose and civilisation. He takes pains to point out that Jaisalmer is not a rarity. For example, a village called Laporia, which is only a five-hour drive from Delhi, receives an annual average of 55 cm (22 inches) of rain. Like many other such villages over the last half century, Laporia neglected its traditional water and pasture management systems and consequently suffered extreme shortages of food and water.

Repairing the traditional tanks and protecting their catchment area has changed that. As Mishra tells it, Laporia now has 103 wells with sufficient water and seasonal surface water tanks that are sustained even through drought years because: "(in) Laporia they took a decision not to grow crops that demanded a lot of water. The community decides wisely. But if society stops making decisions, and then faces drought and then thinks it will learn from Rajasthan, it's not going to happen. You can't copy what the villages of Rajasthan did. You have to first change the way you think."[21]

What then is this required change in thinking?

Lessons for re-growth

- Catch every drop where it falls rather than building economic systems that depend on exogenous waters for either survival or basic economic activity.
- Respect the inherent dynamic of the specific eco-system and design infrastructure and economic activities that work within its limits.
- Cultivate social norms and cultural practices, rather than state policies enforced through policing, to ensure sustainable agriculture and production systems across generations.

Over the last two decades, awareness about these crucial principles has been growing across India – even as mega projects for long distance transfer of water continue to be built and many traditional systems fall prey to a combination of population pressure and land-grab. For example, in Darbhanga many centuries-old ponds are disappearing as the land is encroached and built upon--despite efforts by local groups to protect the tanks. In many cases, untreated

[21] 'Let this be the last photo-op for drought', *Civil Society Online.*

sewage and other pollutants have also destroyed what were, for centuries, stores of pristine water.[22]

However, these negative trends should not obscure the emergence of many positive contemporary efforts. While it is true that more and more water has shifted from community management to private control, new forms of sharing water resources demonstrate that there are many models at work.

The fourth Minor Irrigation Census (MIC), done by the Ministry of Water Resources, Government of India, shows that there were 2,013,582 group wells in India during 2006-2007. Studies show that group well farmers make much more efficient use of water and also tend to share it equitably. "Therefore, there is dire need to recognise the merits of group water sharing practice and offer additional incentives to those farmers in the micro irrigation schemes," writes R.V. Rama Mohan, an expert in water resources and rural development.[23]

Wadhona is a village in the Marathwada region of Maharashtra where only 10 per cent of the land is irrigated. The area has been affected by a severe drought since 2013. While there have been crop failures across that region farmers in and around Wadhona have increased production through a combination of better water shed development, afforestation, farm bunding, organic farming, vermi-composting, agro-meteorology, farm pond, renewable energy, water budgeting, micro-irrigation, fodder cultivation – above all, planned water consumption.[24]

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[22] In an article titled 'Ponds of Darbhanga deconconstructed' Chicu writes: "The construction of a pond began with a sponsor-- usually a member of the royal family or merchant-- who decided to construct a pond to gain some *punya* (blessing). He or she would delegate people to decide the site of the pond, get a priest to set an auspicious date, and announce the details to the surrounding villages. On the appointed day, an excited crowd would gather there, ready to work and socialise. Then would come the marking out of the pond. In the case of the *'ghod-dod'* pond, one side of the pond would be fixed. With much fanfare, a horse would be brought to the pond site and made to run. The place at which it stopped running would be the length of the pond. Yes, *'ghordod' (ghod* = horse and *dod* = run) means the length of a horse's run. …Gang Singh Dev constructed his talaab to ensure that his dynasty, which ruled Mithilanchal for 350 years, remained immortal. In this he suceeded, but he was not alone. Darbhanga has over 225 ponds, each of which has kept alive the name of its creator and the story of its creation." Chicu, 'Ponds of Darbhanga deconstructed!' *India Water Portal*, August 11, 2014, <http://www.indiawaterportal.org/articles/ponds-darbhanga-deconstructed>

[23] R.V. Rama Mohan, 'Irrigation group wells in India: a disregarded ground reality', *Traditional Irrigation Systems in India: Annual Technical Volume, 2015-16,* (January 2016) pp. 31-39. <https://www.ieindia.org/PDF_IMAGES/CouncilData/ATV_CVDB.pdf#page=33>

[24] Aparna Shukla and Yoshita Sengupta, 'Prosperity in times of drought', *DNA India*, June 1, 2016, <http://drought.dnaindia.com/drought-360/prosperity-times-drought>

In the north Indian state of Uttar Pradesh, in a village called Malakpur, community effort is reviving a dry river bed by building check dams to hold monsoon water in a small stretch of what is otherwise a seasonal river. The people's assumption is that if they succeed other villages along its course will follow suit. The endeavour is also to revive local wildlife by taking an integrated ecosystem approach.[25]

In Kutch, where villages commonly rely on water to arrive in tankers, NGOs have worked with communities to deepen old tanks/lakes, construct new wells, reclaim abandoned wells, construct rooftop rainwater harvesting and other recharge structures. These communities are now water self-sufficient even in the peak summer months.[26]

Farhad Contractor, founder of the ecology and water conservation NGO, Sambhaav Trust, has successfully demonstrated the contemporary viability of the traditional water culture by demonstrating how many communities are now adopting those methods and becoming water self-sufficient. Contractor, who is now working with about 600,000 people across eight states of India says that in each of those locations people are choosing to go back to traditional wells, abandoning borewells, which have led to an acute water crisis.

In the Rajgarh block of eastern Rajasthan, Sambhaav Trust has worked with 50 villages to revive 22 km of a river. This is an area where about 65% of the population was earlier compelled to migrate for work because their wells had run dry with a resulting shortage of both food and drinking water. Contractor says the restoration was based on one principle: ensuring that rain water flowed slowly, instead of gushing away, thus allowing for plenty of groundwater recharge.

There are now government programmes that support these endeavours. Nilekani and Subramaniam, founder and CEO respectively of Arghyam, write that there are more than 500 such success stories across India that have directly benefited hundreds of thousands of citizens. Arghyam, a philanthropic institution, has supported numerous grassroots efforts based on the insight that making invisible water visible can work wonders by enabling communities to understand groundwater as a finite, but renewable, resource.

In Maharashtra ACWADAM, an NGO founded by hydro geologists, has worked with communities, helping them map their aquifers, understand water availability and accordingly plan how to use the water. Nilekani and Subramaniam report that these are social protocols that have subsequently been formalised by the panchayats – elected village bodies that work

[25] Mohammad Ali , 'A people's movement in Uttar Pradesh to revive a river', *The Hindu*, April 30, 2016, <http://www.thehindu.com/news/national/other-states/a-peoples-movement-in-uttar-pradesh-to-revive-a-river/article8537967.ece>

[26] Rohini Nilekani and Mala Subramaniam, 'Revitalise our aquifers'.

at the grassroots of India's multi-tiered democratic governance. It took only three years for the community to secure its drinking water and agricultural needs.[27]

These trends are not limited to India. Contractor is now working as a consultant with the government of Morocco to create long-term water solutions, based on the essential principles of the traditional Indian methods. Others are doing the same in far-flung corners of the world. In August 2015 a report in the *Guardian* described how traditional water wisdom was being deployed to craft contemporary solutions in India, Peru and Kenya.[28]

Conclusion: framing a water-*regrowth* discourse

In the blistering summer of 2016 one of India's leading daily newspapers reported how parts of Jaisalmer had doubled crop production, thanks to irrigation from the Indira Gandhi Canal which brings the water of the Sutlej and Beas rivers across hundreds of kilometres to Rajasthan.[29]
While canal irrigation has dramatically improved yields in the short run, across India, it has also created new and often intractable problems. In 2009 a government report described the twin problems of waterlogging and salinity as having reached an alarming level in considerable areas of Uttar Pradesh, Rajasthan, Gujarat, Haryana and a few other states, threatening to render the affected areas barren.[30]

Nevertheless, in May 2016 India's water resources minister, Uma Bharti, declared that transferring water from major and minor rivers, including the Brahmaputra and the Ganges, to drought-prone areas would now be fast-tracked.

The government claims that linking rivers would irrigate 35,000 hectares of land and generate 34,000 megawatts of electricity. The idea of inter-linking India's rivers, first mooted more

[27] ibid.

[28] Nivedita Khandekar, Geoffrey Kamadi, and Dan Collyns, 'The three wonders of ancient world solving modern water problems', *The Guardian*, August 19, 2015, <https://www.theguardian.com/global-development-professionals-network/2015/aug/19/water-scarcity-drought-peru-kenya-india>

[29] Vimal Bhatia, 'Canal charisma: bumper crop in dry Jaisalmer', *Times of India*, April 24, 2016, <http://timesofindia.indiatimes.com/india/Canal-charisma-Bumper-crop-in-dry-Jaisalmer/articleshow/51961793.cms>.

[30]Government of India, 'Report of the High Level Expert Group on Water Logging in Punjab', *Government of India Planning Commission*, January 2013, <http://planningcommission.nic.in/reports/genrep/rep_waterpunjab2702.pdf>. See also: Manu Moudgil, 'Scam of a Canal', *GOI Monitor*, July 18, 2012, <http://www.goimonitor.com/story/scam-canal>

than three decades ago, has consistently been opposed by environmentalists who draw on data about the ecological problems caused by existing canal networks.[31]

It is significant to note that even the ruling party, the Bharatiya Janata Party (BJP), is divided on this issue. Murli Manohar Joshi, a senior leader of the BJP, has publicly opposed the inter-linking of rivers and argued that rainwater harvesting and large scale afforestation would be more effective in resolving the water crisis. Joshi's objections are based on the impracticality of large scale inter-linking of rivers, considering the large amounts of electricity required to pump water across varying gradients. Indian agriculture is already among the most wasteful in terms of water use. Ample supply of exogenous waters could easily become an encouragement for it to continue being wasteful.[32]

Such dissent notwithstanding, expensive schemes for long distance movement of water, which add billions of rupees to the GDP, are still vastly popular with policy makers and private sector alike. Local solutions of the kind outlined above are seen as good for the 'grassroots', but not viable for an economy that must strive for an 8% to 10% annual growth rate. Innovation in more efficient use of groundwater is now encouraged both in the public and private sectors, but what is missing is a wider understanding of how hydrology affects, and is affected by, the human economy.

In this context, there are broadly three dimensions on which a re-growth water discourse can be built.

ONE: There is more and more scientific work to show that merely improving water efficiency is not enough. It is far more important, if not imperative, to map how a business or development project affects the wider environment: that is, what is its impact on competing human and non-human demands for water? Veena Srinivasan and Sharachchandra Lele, fellows at the Centre for Environment and Development, Ashoka Trust for Research in Ecology and the Environment (ATREE) in Bengaluru, explain why this is so:

> Boosting recharge through rainwater harvesting structures, such as small check dams, is a popular measure. However, any water that recharges is water that does not flow downstream. Often users located near check dams simply extract more water, while users further downstream wonder why their rivers and tanks are drying up. Another technological solution is to improve efficiency through subsidised drip irrigation or

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[31] Navin Singh Khadka, 'India to 'divert rivers' to tackle drought', *BBC News*, May 16, 2016, <http://www.bbc.com/news/world-asia-india-36299778>

[32] Deccan Herald, 'Joshi junks prime minister's river-linking plan', *Deccan Herald*, May 12, 2016. <http://www.deccanherald.com/content/545867/joshi-junks-prime-ministers-river.html>

> energy-saving pumps. Again, these have often resulted in farmers increasing their irrigation area with no decrease in water extracted. And farmers are not alone; conscientious urban dwellers take pride in reusing wastewater for gardens and parks. But this could result in more wasteful water use, with the additional 'wastewater' being used in lawns or golf courses where none previously existed.[33]

One stark illustration of this is the fate of the river Narmada, in central India, which has been dammed at multiple points in its course, reducing it to a trickle by the time it reaches the Gulf of Cambay. The mouth of the Narmada once stretched across 1.5 km at Bharuch. By the summer of 2016 this had been reduced to barely 400 meters, with resulting salinity ingress reaching as far as 40 km inside. Ashish Kothari, of the environmental group Kalpavriksh, has reported that agriculture, drinking water supply and industries are negatively impacted by this salinity.[34]

TWO: The re-growth discourse can build upon the United Nations Environment Programme's (UNEP) efforts to 'decouple' water from GDP growth. That means finding ways for an economy to grow without a corresponding increase in environmental pressure. The UNEP's report, titled 'Options for Decoupling Economic Growth from Water Use', shows that since the 1980s, some countries have stabilised their water withdrawal rates by improving irrigation techniques and because of the decline of some water-intensive industries, such as mining and steel.

The UNEP and other international agencies differentiate resource decoupling and impact decoupling, as well as absolute and relative decoupling. "Resource decoupling exists when economic growth exceeds the growth rate of resource use; in other words, when the economic productivity of resources is increasing. …Impact decoupling occurs when the environmental impact of economic activities is reduced."[35]

Among the lessons this report draws from various case studies are:

> • Healthy ecosystems, sufficient water and biodiversity play a critical role as infrastructure in rural as well as urban areas, where the population and the economy are growing the fastest. **The maintenance or restoration of ecosystems should be considered a priority for both public and private investments.** (emphasis added)

[33] Veena Srinivasan and Sharachchandra Lele, 'Why we must have water budgets'.

[34] Ashish Kothari, 'Chronicle of a tragedy foretold: The Sardar Sarovar Project is a huge ecological and social disaster', *The Hindu*, July 19, 2016, <http://www.thehindu.com/opinion/op-ed/sardar-sarovar-project-chronicle-of-a-tragedy-foretold/article8866673.ece?homepage=true>

[35] UN Environment Program, 'Options for Decoupling Economic Growth from Water Use and Water Pollution', *UNEP Report*, (2016), <http://www.unep.org/resourcepanel/KnowledgeResources/AssessmentAreasReports/Water/tabid/133332/Default.aspx>

• River or water basin planning is the foundation for designing water policy that reconciles economic growth, the protection of freshwater eco-systems and the creation of jobs linked to the green economy.

• Payment for ecological services (PES) has been identified as a tool used by many sectors, notably agriculture and forestry, to promote the management of land and water resources and provide the necessary incentives for restoring rural livelihoods and for rehabilitating damaged eco-systems.

• Involvement of communities in green growth programmes will improve the environment and livelihoods, and will encourage social cohesion.

• Good governance in a river basin requires an authority that can coordinate stakeholders with competing demands and allocate water equitably among them, including agriculture, energy, urban water supply and industry.

Since the UNEP report works within the dominant definition of growth its primary focus is on more efficient use of water and reduction of wastage so as to add to the GDP.[36]

From a re-growth perspective this report is significant because of its emphasis that: " … there is an upper limit to the possible withdrawal of water, determined by the hydrological cycle; so that, although some decoupling has already been achieved as described, the future calls for more in order not to surpass nature's limits."

This empowers the re-growth discourse to strive for a higher level of ambition – a shift away from a purely anthropocentric view of water to a holistic approach that takes into account the needs of the entire ecosystem. As Nilekani says: "Water is a geo-morphological entity in itself, so it has a large planetary role to play and the hydrological cycle is very complicated."[37]

THREE: The biggest hope for a dynamic re-growth water discourse is that endeavours of the kind outlined above demonstrate creative ways to sift needs from wants. Many of the success stories described here are based on choices in favour of well-being, based on recognition of limits, rather than an accumulation of wealth in monetary terms. It is very likely that few of those stories would remain a success if some or all of the beneficiaries opted for crops that used more water than their ecosystem could sustain.

At the heart of building a water re-growth politics is the complex problem of cultivating a culture of democracy that is rooted in sustainability. Uma Shankari, who has both studied the mechanics and politics of water and run a farm, explains the challenge in a nutshell:

[36] For example, the report says: "Consider and apply policy measures to curb water demand and re-allocate water between sectors and users according to where water produces goods and services most beneficial to society, i.e. where it contributes to most economic output per drop. Water pricing and market instruments could be used to achieve this. However, water is a basic human need and such measures need to be balanced against measures to protect vulnerable groups, particularly the poor."

[37] Telephone interview conducted by author, July 4, 2016.

"While democracy gives dignity and freedom, if it is not backed by an approach to life which is holistic and sustainable, it can result in acute natural resource crisis. So the challenge lies in working out how to decouple growth and employment; decouple democracy and growth. Essentially it's a question of decoupling economic prosperity and consumption from happiness." [Email from Uma Shankari] Since the rapidly accelerating crisis of water is so directly a life-or-death issue it constitutes the most compelling entry point for grappling with this challenge and demonstrating the imperative for shifting the global economy to a steady-state approach. Ambitious tech-fix solutions, like large scale desalination plants, inter-linking of rivers and tapping deep under-ground fossil water, may seem more politically powerful at the moment. But awareness of the short-sightedness of these approaches is already evident in the global mainstream discourse. It is up to the votaries of re-growth to more actively intervene in the policy making process across the world to demonstrate in detail why and how water can carry us, enable us, to transition to post-growth abundance.

In conclusion:

Traditional and contemporary community-based water systems offer us critical insights and principles for building an economic system where the goal is a steady-state, not perpetual, growth.

A wider spread of creative grassroots practices is important, but that will not, in itself, enable the transition to a re-growth or post-growth political economy either in India or at the global level.

Water is the most urgent reason why opponents of the steady-state approach should reconsider their position. The accelerating water crisis illustrates why redefining growth is no longer a choice, it is an imperative.

Forming futuristic systems of water commons, taking inspiration from but not being limited to traditional practices, is a complex, but not insurmountable challenge.

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