



## Musing over the Kerala Model of Development in the light of recent extreme events

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In the last two years the State of Kerala, had to face devastating events during the monsoons; a synergic corollary to the lopsided evolution of the Kerala Development Model (KDM) forced upon its ecoscape by the zealots of ceaseless growth-based development pattern and relatively extreme climatic events. Meanwhile the state also had to face epidemics, first a zoonotic outbreak (a local outbreak of Nipah incidences) and currently a pandemic by the SARS-Cov19 virus. Extreme climatic events are expected to recur in the coming years due to the ongoing global warming (National Academies of Sciences, Engineering, and Medicine 2016; Mal et al. 2011) another consequence of the ceaseless-growth based paradigm of development. Thankfully, the situation could be handled by a committed State government and its capable bureaucratic machinery; the compassionate humans from the State and diverse corners of the world and an admirable pack of volunteers steadfast to support the victims in all possible manners - physical, mental and financial. The recent episodes of climate calamities illustrate Kerala's vulnerability to climate extremes and maybe a presage of the high probabilities of such incidences in the future.

It is well known that further to such disasters there may be varied consequences and also opportunities (IPCC 2018). Physical injury and loss; epidemic outbreaks (infectious, vector-borne, zoonotic), vector and vermin outbreaks; limited access (to food, shelter, potable water, medical and other essential amenities) followed by high demands and price hike; mental illness (anxiety, depression, etc.); exposure to hazardous chemicals and waste; poor waste disposal, etc. being some of the common pressing consequences. It would certainly take time, resources and commitment to facilitate recovery from physical, mental, social, and economic trauma. The state had proved its capacity and resilience for quite a speedy recovery during the deluge; the success in controlling the COVID-19 outbreak is again attesting the state's potential, the strength of its largely public-funded health care system. However, strategizing the path to

recover from such disasters, particularly that from climatic changes would demand introspection on the obvious gaps and drawbacks in the contemporary variant of the state's development model in practice. This is very crucial since the prevailing notion of economic development is the current ecologically destructive pattern of development.

### **The Kerala Model of Development and environment**

The erstwhile “Kerala model of development” (KMD) refers to the worthy socio-economic development of the state since its formation. Dreze and Sen (2014) while acknowledging that “there is much to learn from scrutinizing the experiences of Kerala” also notes “there is little evidence for seeing Kerala as a model to be mechanically emulated”. Nevertheless, the model is highly praised since that took the state to a position on par with many developed countries, concerning various development indicators. Kerala has witnessed the positive outcome of a demographic transition, population stabilization and a consistent rate of economic growth. The state also topped the score of Sustainable Development Goals index as per the NITI Ayog (2019) in India. Achievements in many aspects of ‘quality life’ despite the relatively low-income level as noted by many authors (Sen 1997; Parayil 1996; Dreze and Sen 1995) would be worth examining in other states for customized emulation.

The drivers of KMD were many; unique geography and landscape, climate and history that shaped a fairly metropolitan culture in the state, a relatively tolerant demeanour towards cultural and religious diversity, a caring attitude towards the local ethnic lifestyles, a cohort of social and political reformers and widespread appreciation of the value of education, etc. The pioneering efforts of the Christian missionaries to set-off free and universal education, the persuasion from much-admired social reformers, the spread of socialistic and egalitarian ideology all could successfully eclipse the earlier domineering feudal and rigid caste-based social structure one-time ingrained in the society (Balakrishnan 2008; Gurukkal and Varier 2018).

Although the state’s economy is traditionally agrarian, over time agriculture waned and farming almost diminished as a career option for the literate youngsters. Kerala never had a great ambiance for an industrial boom in its history. In the post-independence period, the highly politicized, skeptical, and environmental health conscious population hardly patronized industries in the land. Probably the passionate environmentalists on one side and the centrists and socialists who beefed up the labor force on the other perchance could restrict and discourage entry of private corporate agencies in Kerala to an extent. As a consequence, the dearth of opportunities at home and the need for skilled workforce elsewhere prompted the movement of people for employment. The 'gulf boom' markedly in the northern part of the state, the Malabar region, and its contemporary 'US boom' in the southern part, Travancore, boosted the economy so much so that the common person's desires, at the cost of natural resources, for development and comforts in life greatly levitated. Eventually, the people in the state transformed into a society questing for material possession, a version of excessive consumerism (Swaggler 1994) or economic materialism, except perhaps in the last couple of months owing to the recent pandemic and lockdown. In recent years, foreign remittance from the non-resident Keralites (NRKs) is said to be in the range of INR 95,000/- crores a year ([www.financialexpress.com](http://www.financialexpress.com)), that certainly may take a beating because of Covid-19 and its



economic aftermaths. Nonetheless, such developments eventually led to a no-care attitude towards environmental/ecological issues and subsequent unsound changes in its landscape and waterscape (Raj and Azeez 2010).

The urbanization in Kerala has been advancing, through its length and breadth, in such a way that the state as a whole is nearly a single conterminous urban agglomeration, a megalopolis, in effect typifying decentralized urbanization (Ishaque and Jayapal 2019). The one-time



**The Western Ghats region of the Kerala state is undergoing large scale habitat destruction/fragmentation due to various infrastructure development projects like this wind farm installation at the Sholayur area.**

major urban centers in the state are expanding rapidly, engulfing the surrounding natuescape, natural geomorphic features, hills, forests, rivers, streams, and rice paddies, largely disregarding the terrain employing modern adaptable construction techniques. During the last couple of decades, the state witnessed huge deforestation, mining, and quarrying in its ecologically vital hill ranges. Currently the rice (staple diet of the state) cultivation, once spread all over the state, is restricted only to few pockets (Raj and Azeez 2009). Kerala is renowned for its perennial networks of median and small rivers and brooks flowing from the Western Ghats to the Arabian Sea. Nonetheless, during the course of development, the state has dammed its major rivers at its upper reaches. Incidentally, it is said that the recent floods affected much the dammed rivers; in fact, many of these dams are located in the landslip s prone regions. There are currently 61 dams and many dikes and subsurface dams in the 44 rivers of the state. Furthermore, the mid and lower reaches of all the rivers were plundered heavily for the rising demand for sand (Shaji and Anilkuar 2016; Arun et al. 2006) and pebbles.

In the context of KMD it is relevant to consider a couple of its dimensions, drivers, or trends. Of these, a very relevant one is the evolution of scientific temperament or knowledge-based rationality in society. The Kerala Sashtra Sahithya Parishad (KSSP), started by a group of educators and writers in the early 1960s, grew up into an impactful people's science movement. The KSSP in effect played a major role in building a scientific conscience in the public towards the environment, ecology, protection of nature, etc. The popularisation of scientific conscience insinuated discernments about better living standards and awareness of rights. While the scientific conscience dwelt upon a welfare state economy and was concerned much about the state's environment, over time apathy towards nature has grown significantly. While the objections to the Gadgil committee report was an example of how self-promoting politicians could misrepresent scientific facts to distort public perception, the dilution of the Kerala Conservation of Paddy Land and Wetland Act (2008) exemplified how the authorities dilute well-meant regulations possibly under pressure from short-sighted interest groups. These movements of trends are discussed a bit more below to show the need for a new updated version of KMD for the state.



## People's science and environment conservation movements in Kerala

The highly literate society of Kerala has gone through a thorough course of social reformation that had constructive reflections in literature, art, academics, governance, and administration of the state, the country, and away. It is the process that inspired and nurtured an empathetic, tolerant, and relatively well-informed society. Arguably the most popular people's science movement in the country, the Kerala Sasthra Sahithya Parishad (KSSP) was an offshoot of the



**The gate way to the Silent Valley National Park, Palakkad District, Kerala; The 'Save Silent Valley' movement- one of the successful peoples' movement for biodiversity conservation in the early 1970s**

ongoing social and educational reformation in the state, and also subsequently one of its major driving forces. KSSP committed to scientific and environmental conservation awareness in earlier times was a typical story and motivation to many successful people's movements to conserve environmental well-being. Regarding environmental protection in the state, the well-known 'Save Silent Valley' movement in the 1980s was a milestone. KSSP that spearheaded the movement could infuse a powerful insight in the general public that effectively forced out an expert-driven decision on the matter from the policymakers. However, the KSSP had in recent years fallen to not even the shadow of its former self. While the social order in the state is evolving in line with the general trend especially of the country, but certainly to a much lesser degree, it is facing a post-truth society where truth and values do not matter much and half-truths or distorted truths broadcast for public consumption are decisive. Superstitions and pseudoscience while is propagated, if not justified, by powerful personalities elsewhere in the country, in the state that is still looked down by most public because of awareness nurtured by literacy, education, and peoples' science movements. That social capital, largely welfare-oriented governance and public-funded infrastructure helped the state to handle the calamities. The response of the state government to the recent COVID-19 pandemic has shown the path to the nation on control of the viral spread basing on systematic, scientific and rational insights. Rightly that has been well appreciated the world over. Those types of knowledge-based actions are required in the state to cope with the potential extreme events, as of now ineluctable climate change as well. Movements such as one-time KSSP are much more wanted now to develop a sustainable development path and wean the society from the current praxis that is grossly unsustainable.

### Need for dusting Gadgil reports

The Western Ghats shaped the socio-political-cultural-ecological milieu of Kerala greatly, the other equally or more influential natural feature is the Arabian Sea. For a long past, large



accessible areas along the hills were under cultivation and infrastructural transformation; but in a manner not abrupt to tip the area's carrying capacity, sustainability and ecosystem evolution. The pressure turned many folds in recent times when decision-maker-politician-corporate nexus excavated and amassed huge wealth by untenably exploiting the natural resources in the beautiful 'blue mountain' range, disregarding the priceless ecosystem services that sustain about 400 million people (Molur et al. 2011) in and outside the state.

The Western Ghats Expert Ecology Panel (WGEEP) report unveiled the magnitude of pressure the current pattern of development has been thrusting on the Western Ghats' ecological setup and it especially warned the state of Kerala about the pace of damage being inflicted on the vital ecosystem and its consequences. The report also urged the state to rethink the path taken towards the "new nirvana" (Pilling 2018) of the existing development model. The report advised for a profound transformation of its current idea of (unequal or unbalanced or unsound) development to a more realistic, scientific and sustainable development with an egalitarian welfare perspective. The committee had a great expectation about Kerala, for its high literacy rate, social-environmental consciousness and above all its leadership capability in capacity building through the three-tier Panchayati raj system '*Janakeeyasoothranam*' (peoples' planning). However, the instigated opposition to the WGEEP report from the so-called farmers forced the UPA government to hold back. If not, that would have been a path-breaking eco-centric decision which would have lessened many of the recent woes the public in the state had gone through. Eventually, the central government decided to review the relatively holistic recommendations of the WGEEP and appointed a High-Level Working Group (HLWG; Kasthurirangan Committee) perchance with an implicit brief for more economic-centric management plans.

The epidemic outbreaks in the recent past in the state were zoonotic; pathogens crossing over to humans from wild animals. One of the major external factors that influence the spread of zoonotic diseases is the quality of the environment, higher ingress of people to the wilder areas, and higher contact with wild species. Even the SARS epidemic (Li et al. 2006) or recent pandemic SARS-CoV2 (COVID-19) is said to have linkages with wild species (Broad 2020) and many such pandemics are likely to sprout in future as habitat and biodiversity loss increases globally ([www.theguardian.com](http://www.theguardian.com)). The conservation of natural habitats in effect reduces human contact with wild species and the probability of the outbreak of zoonotic diseases. Such recent tragic episodes, both epidemic and climatic emphasize the need for proactive conservation of the state's ecological setup, its wilderness, in particular, the Western Ghats and reconsidering the almost forgotten WGEEP.

### **The Kerala Conservation of Paddy Land and Wetland Act (2008)**

The Kerala Conservation of Paddy Land and Wetland Act (KCPLW, 2008) was another vital and positive action to protect rice paddies, a significant component of the local ecological setup of the state, providing crucial ecosystem services (Nayak et al. 2019). A few wetlands in the state had been earmarked for protection under the Ramsar convention (1971), Coastal zone protection (1991) and as wetlands of national importance under National Wetland Conservation Programme. However, the reclamation of wetlands has been rampant, mostly adjacent to towns, urban sprawls, highways, and institutions and suchlike. The conversions of wetlands



were explicitly apparent in Kerala for its relatively high population density (~859/sq Km), the limited available land area and the dominant culture of the nuclear family with distinct residences for each family unit. Kerala stands at the top along with Punjab in household surplus in the country ([www.nabard.org](http://www.nabard.org)) adding on to construction spree. Since urbanization in Kerala



**As the agrarian economy of the Kerala State transformed to a more consumer based economy, many of the rice paddies of the state have been converted to cash crop growing areas like coconut groves (left image) or left fallow for further conversion to built up land (right image)**

is much of a 'highway centric-ribbon development' the common stance is that roads should reach every house at whatever cost to the environment, flattening the hillocks, cutting steep slopes, filling up all the low-lands including the crucial rice paddies or blocking natural water flows through half-baked engineering solutions. Incidentally, one of the major reasons for the recent deluges was blockage of natural channels for the discharge of flood-waters for unscientific constructions; Hume pipes replacing open channels and drains, bound to be clogged, reaching nowhere. The fast surface runoff due to torrential and untoward rain carried millions of tons of topsoil to the waterways, which on one hand exhausted the nutrient-rich surface soil and on the other blocked the fluvial courses.

The original KCPLW Act, while restricting many activities, allows rural and urban governing bodies to reclaim about 10 cents and 5 cents of rice paddies under their jurisdictions, to build residential houses. The recently proposed Amendment of the 2008 Act regularises any size paddy land conversion before the promulgation of the original act, and as per the Kerala finance (no. 2) bill (2015) such conversion can be legalized by paying 25% of the fair value of land, a major blow to the latter and spirit of the 2008 Act. The amendment is bad indeed for the already decimated rice paddies and wetlands in the state. The price of a wetland is slight compared to that of buildable dry land in the state and the proposed payment for legalizing the conversion is minuscule relative to the market price gettable after the land is made fit for constructing a building. In any case, market price rarely comes into the record in land transactions; an avenue where black money can be conveniently parked/invested and rent-seeking rampant.

### **Kerala's redevelopment- the future model**

The flood episodes in the recent past have affected gravely the highland and the lowland regions of the state. The midland areas also had their share, but of lesser dimension and consequence. The highland regions suffered devastating landslides and the lowland regions were affected gravely from heavy flood and water stagnation. There was no sufficient leeway



for the water to debouche, all the natural pathways and buffer storages having been blocked or encroached by constructions. In short, the damages mostly were intense and concentrated in and around ecologically sensitive areas including riverbanks, flood plains of the rivers, backwaters and rice paddies, valleys, and high slopes in the Western Ghats. If one zooms into the spread of the disaster it further reveals how the state's ecologically sensitive areas were mistreated for so-called developmental activities by unscrupulous interest groups.

Incidentally, back in 2006 ICMR in the context of cyclic outbreaks of dengue in Kerala had noted that the state having undergone enormous change in its physiography and climate had “risks of emergence or resurgence of several vector-borne diseases” (Anonymous 2006). As is well-known the state is highly dependent on other states for almost all essential items, grains, pulses, vegetables, and livestock. Paddy and pulse productions are insignificant compared to the needs (Economic Review 2018). Hence, it is high time for Kerala to introspect on a sustainable development model focusing on self-reliance at even at village levels.

The state has demonstrated the effectiveness of its public welfare-oriented relatively egalitarian development focusing on education and healthcare facilities in the case of disease outbreaks. Heller ([www.thehindu.com](http://www.thehindu.com)) acknowledges that “the state managing the crisis with the most resolve, the most compassionate and the best results of any large state in India” as dividends from the “legacy of egalitarianism, social rights, and public trust”. The state needs a self-sufficient and self-reliant system to extend and ensure its proven achievements to combat calamities. It is time that the state proceeds to ‘Kerala model of development plus (KMD+)’ focussing on social, economic, and cultural transformation forging solidarity with nature, deviating from the beaten path of the consumerist economy.

It would be also apt now to contemplate upon the concept of “Ecological Civilisation” - the theme of the 15<sup>th</sup> CoP of “Convention on Biological Diversity” ([india.mongabay.com](http://india.mongabay.com); [sdg.iisd.org](http://sdg.iisd.org)) or perhaps to the more radical concept of “Steady State Economics” with the goal of satisfying “basic human need within ecological limits” (Karp 2020). The state should explore a paradigm shift in its development perspective by incorporating Gross National Happiness (GNH) or Genuine Progress Index (GPI) rather than Gross Domestic Product (GDP), the way the regions prone to natural calamities essentially need to transform ([conferences.matheo.si](http://conferences.matheo.si)). But, all that needs are a radical transformation, and figuratively speaking ‘social vaccine’ with broader scope “to develop the ability of communities to resist and change social and economic structures and processes that have a negative impact on” (Baum et al. 2009) not only ‘health’ but overall human welfare. A cultural radical transformation is necessary for the individual citizen to the Government vis-à-vis development, focussing on social welfare rather than unbridled consumerism, shedding the notion of perpetual growth and with the deep recognition that humans are biologically and ecologically symbiotic with other life forms, that human economy is just a sub-system in the finite natural system. It is a shift towards self-reliant village economy possibly in a Gandhian prospect - holistic and multidimensional, aiming at local self-sufficiency while cooperating with nature. This is the time for a superior model of development for the state, a KMD+ (or maybe KMD-2) that would advance inclusive and egalitarian development, covering all marginalized sections of the society. It would embrace diverse dimensions of human security (e.g., Economic, Food, Health, Environmental, Personal, Community, and Political) and human development, ultimately human welfare in a sustainable environment with high resilience to

the impending changes of climate and its repercussions. COVID-19 gives an unforeseen opportunity to re-route development from extinction to survival, beyond the common dissimulative verbal discourses on sustainable development. It is sufficiently evident that the present-day paradigm of development only furthers deprivation of a major section of humankind from basic survival needs, a minuscule fraction controlling all the resources, the disappearance of crucial ecosystems and the sixth extinction, maybe including *Homo sapiens* as of now the most damaging species on earth. Perhaps the state of Kerala can be a trailblazer along with like-minded communities across the globe, towards a welfare society in a secure nature/environment.

### References

1. National Academies of Sciences, Engineering, and Medicine (2016) Attribution of Extreme Weather Events in the Context of Climate Change. Washington, DC: The National Academies Press. doi: 10.17226/21852
2. R K Mall, S D Attri and Santosh Kumar (2011) Extreme Weather Events and Climate Change Policy in India, *Journal of South Asia Disaster Studies* 4(2): 21-39
3. IPCC, Extreme Events and Weather Disasters, <http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=354>
4. Dreze J and A Sen (2014) *The uncertain glory - India and its contradictions*. Penguin Books
5. [https://niti.gov.in/sites/default/files/2019-12/SDG-India-Index-2.0\\_27-Dec.pdf](https://niti.gov.in/sites/default/files/2019-12/SDG-India-Index-2.0_27-Dec.pdf)
6. Sen, A (1997) "Radical Needs and Moderate Reforms" in J Dreze and A Sen (eds.), *Indian Development: Selected Regional Perspectives*, New Delhi: Institute of Social Science
7. Parayil, G (1996) "The 'Kerala Model' of Development: Development and Sustainability in the Third World." *Third World Quarterly* 17(5): 941-957
8. Dreze J and A Sen (1995) *Economic Development and Social Opportunity*, Clarendon Press, Oxford
9. Balakrishnan P K (2008) *Jathivyavasthithiyum Keralacharithravum (Malayalam) (The Caste system and History of Kerala)*, DC Books
10. Gurukkal R and R Varier (2018) *History of Kerala – Prehistoric to present*, Orient BlackSwan
11. Swaggler, R. (1994) Evolution and Applications of the Term Consumerism: Theme and Variations. *Journal of Consumer Affairs*, 28(2), 347-360. doi:10.1111/j.1745-6606.1994.tb00856.x
12. [www.financialexpress.com/economy/half-of-indias-overseas-remittances-come-from-these-4-southern-states-kerala-tops-the-list/1382291/](http://www.financialexpress.com/economy/half-of-indias-overseas-remittances-come-from-these-4-southern-states-kerala-tops-the-list/1382291/)
13. Raj PPN and PA Azeez (2010) Public opinion on conserving an urban wetland- A case from Kerala, India. *International Journal of Social Ecology and Sustainable Development*, 1(1): 14-19, January-March 2010
14. Ishaque P K A and G Jayapal (2019) Implications of Decentralized Urbanization in the Sustainable Development of Kerala, India. *International Journal of Applied Social Science* 6 (1): 81-85
15. Nikhil Raj PP and PA Azeez (2009) Real estate and agricultural wetlands in Kerala. *Economic & Political Weekly XLIV* (5), January 31: 63-66
16. Shaji J and R Anilkumar (2016) Socio-Environmental Impact of River Sand Mining: An Example from Neyyar River, Thiruvananthapuram District of Kerala, India. *IOSR Journal Of Humanities And Social Science* 19(1): 1-7
17. Arun P. R., R. Sreeja, S. Sreebha, K. Maya and D. Padmalal (2006) River sand mining and its impact on physical and biological Environments of Kerala rivers, southwest coast of India, *Eco-chronicle* 1(1): 1 - 6
18. Molur, S., Smith, K.G., Daniel, B.A. and Darwall, W.R.T. (2011) *The Status and Distribution of Freshwater Biodiversity in the Western Ghats, India*. Cambridge, UK and Gland, Switzerland: IUCN, and Coimbatore, India: Zoo Outreach Organisation.
19. David Pilling (2018), *The Growth delusion*, Bloomsbury India



20. Li W, S Wong, F Li, J H Kuhn, C Huang, H Choe, and M Farzan (2006) Animal Origins of the Severe Acute Respiratory Syndrome Coronavirus: Insight from ACE2–S-Protein Interactions – Minireview. *Journal of Virology* 80(9): 4211–4219, doi:10.1128/JVI.80.9.4211–4219.2006
21. <https://www.theguardian.com/environment/2020/mar/18/tip-of-the-iceberg-is-our-destruction-of-nature-responsible-for-covid-19-aoe>. Accessed on 10 Apr 2020
22. Nayak A K, Md Shahid, A D Nayak, B. Dhal, K. C. Moharana, B. Mondal, R. Tripathi, S. D. Mohapatra, P. Bhattacharyya, N N Jambhulkar, A K Shukla, Nuala Fitton, Pete Smith and H. Pathak (2019) Assessment of ecosystem services of rice farms in eastern India. *Ecological Processes* 8. 10.1186/s13717-019-0189-1.
23. [https://www.nabard.org/auth/writereaddata/tender/1608180417NABARD-Repo-16\\_Web\\_P.pdf](https://www.nabard.org/auth/writereaddata/tender/1608180417NABARD-Repo-16_Web_P.pdf)
24. Anonymous (2006) Dengue in Kerala. *ICMR bulletin* 36(4-5). [https://www.icmr.nic.in/sites/default/files/icmr\\_bulletins/april-may06.pdf](https://www.icmr.nic.in/sites/default/files/icmr_bulletins/april-may06.pdf)
25. <http://spb.kerala.gov.in/ER2018/index.php>
26. <https://www.thehindu.com/opinion/lead/a-virus-social-democracy-and-dividends-for-kerala/article31370554.ece>
27. <https://india.mongabay.com/2020/04/commentary-ecological-civilisation-and-the-new-global-biodiversity-framework/>. Accessed on 9 April 2020
28. <https://sdg.iisd.org/news/2020-biodiversity-conference-theme-to-focus-on-ecological-civilization/>
29. Karp A (2020) Defending and driving the climate movement by redefining freedom. In *Liberty and the Ecological Crisis: Freedom on a Finite Planet*. Edited by: Christopher J. Orr, Kaitlin Kish, Bruce Jennings. Routledge.
30. <https://conferences.matheo.si/event/0/contribution/62/material/paper/0.pdf>
31. Baum F, R Narayan, D Sanders, V Patel and A Quizhpe (2009) Social vaccines to resist and change unhealthy social and economic structures: a useful metaphor for health promotion. *Health Promotion International* 24(4): 428-433. <https://doi.org/10.1093/heapro/dap026>
32. Broad S (2020) Wild trade, COVID19 and Zoonotic disease risks <https://www.traffic.org/site/assets/files/12764/covid-19-briefing-vfinal.pdf>