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Vinoy Krishna
Department of Science, Lady Irwin College, New Delhi, India

Aniket Kumar
Department of Environmental Sciences, Dyal Singh College, New Delhi, India

Ritu Pandey
Department of Botany, SGTB Khalsa College, Delhi, India

Sandeep K Singh
Department of Zoology, Ramjas College, Delhi, India

Rajneesh Dwevedi
Department of Science, Lady Irwin College, New Delhi, India

Correspondence
Rajneesh Dwevedi
Department of Science, Lady Irwin College, New Delhi, India

The evolution of ecological sensitive zones in India: A case study of Western Ghats

Vinoy Krishna, Aniket Kumar, Ritu Pandey, Sandeep K Singh and Rajneesh Dwevedi

Abstract
The presently employed strategies of conservation are largely exclusionary and any increase in such areas may severely impede the development process and may cause socio-cultural and economic conflicts. This paper deals with a new alternative approach of a departure from the strict go and no go zones mode into regulated inclusionary method of ecologically sensitive zones. The present paper discusses the evolution of the present method with the case study of Western Ghats region. We discuss the various challenges that need to be overcome for a sustainable conservation and development regime to be successful in present and future.

Keywords: Ecological sensitive zone, western Ghat, biodiversity hotspot

1. Introduction
India is one of the mega diverse nations of the world which supports over 8% of the global biodiversity in the 2% of the total land area [1]. As a signatory to the convention on biodiversity India is also committed to the Agenda 21 of United Nations [2, 3, 4, 5]. The Government of India passed The Biological Diversity act in 2002 that provides for the conservation of biodiversity and its sustainable use and equitable sharing of the resources of the same [3]. Earlier, India had also suitably amended its constitution to make it a fundamental duty of the citizens to conserve nature through the article 48A. Constitution also directs the state to enact laws in this regard through article 51 [6]. Mandated by the Wildlife Protection act 1972, India presently manages a network of 700 Protected areas (PAs) including 103 National Parks, 528 Wild Life Sanctuaries and 4 Community Reserves [7]. Studies suggests that globally, the areas covered under the Protected Areas have been consistently on the rise [8]. Undeniably the PAs impact the socio-economic dynamics of the region and have been the reason for many conflicts (Refere). According to a recent report of Environmental Justice Atlas, India tops the list in the number of conflicts related to environmental issues [9, 10]. It is well understood now that for sustainable development the exclusionary model of conservation can offer only a limited success and hence should be supported by more inclusive paradigms like community based conservation, payments based conservation methods etc. [11, 12]. This goes with the developing opinion that development and conservation should not be seen as antagonistic concepts rather complementing each other [13].

At the same time the National Wildlife Action Plan (2002-2016) advocated the region around the PAs to be very vital in preventing the isolation of patches. Such zones would also form the important 'ecological corridors' and should be regulated to let the biodiversity survive in the long run[14].This paper discusses the evolution of the concept of Ecological Sensitive Zones (ESZ) in India and tracks the sequence of events and various issues and challenges in securing the hottest spot of Biodiversity in India i.e., the Western Ghats at the same time ensuring that the development of the region is not jeopardised in the process. The democratic process of involving the stakeholders and addressing the fears, questions and conflicts for over five years, the Western Ghats study can act as guiding light for more effective environmental policy planning and execution in India.

Ecological Sensitive Zones (ESZ)
The first major development in the declaration of an area as ecologically sensitive and significant happened in Dahanu Taluka, District Thane (Maharashtra) in the year 1991 [15]. The whole region was declared to be ecologically fragile and restrictions were imposed on setting

up of the industries. In other instance, possibly in a first of such court intervention, Supreme court in 1993 put a ban and even imposed fines on the lessee for the mining activity that was happening in the ecologically fragile Doon valley region [16]. Several areas were accordingly notified as ecologically sensitive and the development activities were regulated towards the realisation of the goals of Agenda 21 of United Nations. This, the Government derived the authority for, from Environment (protection) Act 1986 [17]. However considering the lack of a systematic definition of the parameters Ministry of Environment, Forest and Climate Change (MoEFCC) set up a committee under Dr. Pronab Sen which submitted the report in the year 2000. The committee defined a fragile area as the one with the possibility of permanent and irreparable loss of the biodiversity and a pronounced damage to the natural processes of evolution and the speciation [18]. The committee further enlisted a detailed primary and auxillary criterias for the naming of the ecologically sensitive zones[19]. The Government accepted the report's recommendations although with the exclusions of few criterias. However the Pronab Sen Committee recommendations do not address the current criteria of reserving the space outside the protected areas as the shock absorbers.

Meanwhile many proposals from the states to declare areas as ecologically sensitive were piling up. Realising the lack of a set format to deal with the proposals MoEFCC constituted a committee chaired by Dr. H Y Mohan Ram. The committee was mandated to establish a format to be followed for the proposals received till March 31, 2001 and also to re-evaluate the ones that were already declared as ecologically sensitive. The committee has not been active since July, 2006 neither has its report been made public [20]. Earlier National Wildlife Action Plan (NWAP) 2002-2016 advocated through its document that protected areas should not be made to exist in a patchy and isolated manner. The long term survival of the biodiversity requires maintenance of the *vital ecological corridor links* and hence the area around the PAs should be suitably protected as well [21]. It mentions the need to adjust the land and water use policies of the region to this all important imperative as well. Also in the XXI meeting of the Indian Board of Wildlife in January 2002 a Wildlife conservation strategy-2002 was adopted which envisioned the land within 10kms range outside the PAs to be declared as eco fragile zones under section 3 of EPA and Rule 5 of EP rules[22]. This however met with an immediate resistance from the states claiming that the decision if implemented would unsettle the development, as many of the cities and other human habitations along with the economic activities would come under the purview of Eco Sensitive Zones. This led to the re-evaluation of the proposals and on 17th march 2005, the board decided that the zone delineation would be site specific and would be subjected to regulation rather than prohibition of various activities in the demarcated areas. The decision was communicated to the states and they were asked to submit detailed proposals demarcating such areas in the state. Further in response to a PIL filed by Goa foundation honourable Supreme Court of India asked the MoEFCC to offer a final opportunity to states to send their proposals within a stipulated time of four weeks [23]. Most of the states however failed again to comply with the instructions. For instance, in the case Sri Anand Arya and Anr. vs Union of India, involving a park at NOIDA near Okhla Bird Sanctuary the honourable Supreme Court in its judgement dated 3rd December, 2010 noted that government of Uttar Pradesh had not declared Eco-Sensitive Zones around the PAs owing to the lack of any specific guidelines from the government of India in this regard [24]. Similar such cases and multiple requests from the states led government of India to publish the detailed guidelines for the declaration of Eco Sensitive Zones around National Parks and Wildlife sanctuaries on 9th February, 2011 [25].

Western Ghats: A Biodiversity Hotbed

Western Ghats represent a continuous range of hills running up to the length of about 1600 kms on the western coast of India. It stretches from 8°N to 21°N and encompasses a total area of over 1.60 lakh square kilometres. It is covered by six states including Gujarat, Goa, Maharashtra, Karnataka, Tamil Nadu and Kerala. The importance of the region accrues from the fact that it is one of the major hotspot of the world and one of the two in India. It is considered as one of the best example for non-equatorial tropical evergreen forests and is a repository of almost 325 threatened flora, fauna, birds, reptiles, amphibians and fish species [26]. Such is the level of endemism that any loss of biodiversity here may cause a permanent damage to the gene pool. According to the WGEEP panel report, of the total 645 evergreen species of India, about 56% are exclusive to Ghats. It also supports immense diversity of lower plant groups like the bryophytes, mosses and liverworts. The high level of amphibian and caecilian uniqueness makes Western Ghats a rare ecosystem [27, 28].

Apart from the well-known biodiversity the area also is a home to diverse cultures which have grown together with the nature [29]. Apart from the direct benefits of maintaining this spot which ranges from water drainage to the carbon sink, the area is also a sustainable provider of economic services like food, fibres and water along with the regular tourism and hydropower projects [30, 31].

This however has led to a continuous increase in the dependent population and an increasing and unmindful exploitation of the region through various hydroelectric projects, tree felling, infrastructure development, mining, quarrying, plantations of cash crops like tea, coffee, rubber etc[33]. This has affected the primary vegetation of the region in very adverse terms[32]. By an estimate only 7% of the primary vegetation of the area survives today and already 51 species of animals are rendered critically endangered[34]. Specific ecosystem services need has prompted the farmers to plant some exotic species like *Eucalyptus sp.*, *Acaciasp.*, etc. [35, 36]. The rapid modernisation along with the population pressure and infrastructure projects have necessitated the parallel conservation strategies to be adopted. The entire stretch of Western Ghats has a number of National Parks, Wildlife sanctuaries and Biosphere Reserves. However these patchy and isolated protections have not been successful in restricting the damage that human activities have been inflicting in the region. For instance the illegal mining in Goa around and even inside of the PAs have caused a huge loss to wildlife habitat and water resource other than causing the air and noise pollution in the pristine region [37, 38].

Origin of Western Ghats ecology expert panel

The human induced direct damage along with the climate change might have a cascading effect on such biodiversity hotspot. The damages inflicted may be irreparable, realising

which numerous civil society organisations and individuals met under Save the Western Ghats movement. The meeting in 2009 was attended by the then environment minister Mr. Jairam Ramesh and the meeting discussions became the proximate cause of the constitution of WGEEP. The committee to be headed by a well-known ecologist Mr. Madhav Gadgil was mandated to study the current status of the Western Ghats, formulate a demarcation pattern for the ecologically sensitive area and develop an overall conservation paradigm for the region after an exhaustive consultations with the locals and civil society organisations among others [38].

The WGEEP panel started on a task that was extremely challenging considering the number of stakeholders involved. It took rounds of consultations with Government Officials, experts, local populations and their representatives through Gram panchayats and Zilla Parishads. The findings were also supplemented with the voluminous geospatial data contributed by the various remote sensing satellites in orbit. Despite the various practical challenges panel completed and submitted its 522 page report on 30th August 2011.However, it required the court's intervention to be made public, through internet platform on 23rd may 2012 [38, 39].

WGEEP Recommendations

The WGEEP panel considers the entire Western Ghats region as ecologically sensitive and suggested a graded approach on the regulatory efforts. The area was divided into three Ecologically Sensitive Zones namely ESZ1, ESZ2 and ESZ3 in the order of highest, intermediate and moderate sensitivity. The regulatory process should hence be accordingly adjusted to the levels of Gram Sabha and Panchayats. However the panel also recommended some sectoral guidelines regarding the same that tries to balance between the need for conservation and development in the area [39]. The panel recommended the constitution of a Western Ghats Ecology Authority [38] as a statutory body appointed by MoEFCC under Environment (Protection) act 1986 to ensure transparent and participative decision making in the sustainable development of the region.

Response to WGEEP

To many sections the report seemed not practical enough and right at the onset it met with an all-round opposition [33]. The fact that the entire stretch of Western Ghats had been proposed to be ecologically sensitive, the declaration would as per a view stifle the growth and development of the region immensely. The confusion was even more aggravated by the unavailability of the report in vernacular languages [38]. The villagers complained that, strictly prohibited zones would severely impact their daily life economic and socio-cultural activities. The lack of proper infrastructure and developmental choice making alternatives would not allow them to think of proper alternatives. Another fear was that the public at large would be left at the mercy of the bureaucracy. In fact in the Mahabaleshwar–pancani ESZ WGEEP received complaints from farmers needing to pay bribes of Rs. 20000 to get a borewell in the region [38]. The fear of inspector raj made the locals overlook the benefits of conservation practices even if they agreed to its importance. In another such case it got frustrating for the locals to avoid human wildlife conflicts. Restrictions didn't allow them to remove the protected animal. About 200 acres of Cardamom plantations of Idduki and Munnar districts were coming under forest land and hence farmers were distressed about its future. Despite the Government's attempts at managing the growth and development of the region, compounded by the reluctance of the locals to be strictly regulated, the two major developments happened. Many protected areas in the Western Ghats were announced to be included in the list of World heritage in the year 2012 [40, 41]. Secondly Shah Commission reported large scale illegal mining happening in the Goa region [42]. Both these factors required similar responses of taking immediate measures to prevent any further damage to the region [37]. Reportedly ban on the mining has shown positive improvements in the environmental rejuvenation [43].

Kasturirangan Committee Revaluation

An all-round opposition from the states and a large scale public protest against the implementation of the Gadgil committee report led Government of India to constitute another High level working group (HLWG) with the similar mandate as the earlier one along with scrutinising the WGEEP panel recommendations in a "holistic and multi disciplinary fashion" [38]. The HLWG submitted its report on 15th April 2013 and had many points of distinction as well as overlap with the Gadgil committee report, which it was also reviewing in the process. It however generated a very complex scenario. On one side the Kasturirangan report was criticised by Gadgil as anti-conservation [44, 45], on the other end it also met with huge criticism from the public at large and political parties in the opposition for not having cared for the people and their development at large [46]. In this regard it requires an understanding of what differentiates the two reports and where do they overlap [47]. The WGEEP had based its observation on the forest survey of India report and reported the total area under the Western Ghatsto be 1,29,037 kms. The report was based on the information collected at a coarse resolution of 9km × 9km. The panel considered the entire taluka as one unit and hence finer analysis within the taluka seems to have gone a bit compromised. The HLWG on the other hand considers villages as the basic unit and the village is considered as ecologically sensitive if more than 20% of its area fulfils the condition under biological richness and forest land fragmentation. HLWG also bases its findings on the observations made by the payloads LISS IV and AWiFS of the IRS satellites [48]. This got them the resolution in the range of 30 to 50 metres. Finer resolutions also meant an increase in the total estimated area by about 27% to around 1,64,280kms. In contrast to the WGEEP having declared the entire stretch of western ghats as ecologically sensitive to be put under graded regulation (ESZ1, ESZ2 AND ESZ3), HLWG demarcates the Western Ghats as natural and cultural landscape and regards just 37% of the total landscape as ecologically sensitive. The cultural landscape covers over 60% represent agricultural, village and non-forest plantations. WGEEP avoids the exclusionary principle of conservation and a strict classification of the areas into go and no-go zones [47]. It advocates promotion of small scale industries building up the case of "developing and conserving thoughtfully [38, 47]" It also pushes for the organic farming, agro based industries and a complete ban on the genetically modified crops to preserve the pristine vegetation of the region. Its report however proposes regulation, albeit in a graded manner of the entire stretch of the Western Ghats and hence would impact largely the developed cities and urban and semi urban areas in

a big manner. HLWG on the contrary regards that the "environmentally sound development cannot preclude livelihood and economic options for this region" and hence its classification into natural and cultural landscape tries to avoid the open confrontation of the development and conservation issues [49]. There appears to be difference of opinion in the two reports concerning the Wind and hydroelectric power as well. The WGEEP advocates against the large scale wind and hydroelectric power projects in the entire stretch of the Western Ghats. It promotes the cause of small scale hydro and wind power projects. HLWG on the contrary leaves it to individual cases subjected to the conclusions of EIA process [47].

Despite all the differences the HLWG report once decided for implementation by the government did also meet with mass protests and large scale opposition. HLWG like WGEEP did retain with some of the clauses which acted as the real roadblocks in the process. Both the reports prohibit the conversion of forest land to non-forest and agricultural lands to the non-agricultural purposes. This is seen as anti-development as it would stall the installation of any further schools, hospitals, housings etc. It would also prohibit creation of large scale infrastructure like roads and railways. The issue was not taken care of despite various inputs from the various stakeholders. Public land to private land conversions have been banned although thousands of the traditional residents have been waiting for years to get the legal documentations done for their patches of land. Both the reports ban such conversions leaving the fate of thousands of dwellers in lurch. Both the reports leave a lot of uncertainty with respect to the rights granted to the traditional forest dwellers in the Forest Rights Act, 2006. The reports prohibit the use of forest area for non-forest purposes which might spell disaster for the traditional forest dwellers as well as the thousands of lease farmers who derive their livelihood from the agricultural fields.

Both the reports want the chemical fertilisers to be banned and replaced by organic farming. However the absence of any mechanism of supporting the farmers to gradually switch over to the new regime of agriculture would obviously turn out to be counterproductive. Human wildlife conflicts in the region is unavoidable. The stringent laws leave the residents at the mercy of the wild animals like Elephants, Wild boar which on a regular basis inflict a lot of damage [33].

Post Kasturiranan report

Post the submission of the report on 15th April, 2013, Government of India sought suggestions from the states regarding modifications of the boundary of the ecologically sensitive areas. The state of Kerala had accordingly constituted various Panchayat level committees to study the impact of demarcating the areas as per the HLWG recommendations. The committees recommended exclusion of the cultural landscape from the ecologically sensitive areas as advocated by the HLWG. The Kerala state government also wanted to have the agricultural lands including the plantations to be out of the purview of the ecological sensitive areas. Unfortunately no other states did submit any similar reports. Taking a positive view on the Kerala state government's views the Government of India did release the final list of the ecologically sensitive area encompassing the six states that make up the Western Ghats. The Draft notification was put into the public domain on 10th March, 2014 for inputs to be provided within sixty days [50]. The impasse did continue as no common conclusion on the matter could be reached. A review meeting in August 2015 [51] involving the MPs from the concerning states with the MoEF minister Mr. Prakash Javdekar was called. Exclusion of rubber and tea plantations from the list of regulated activities was one of the major demands other than the complaints about the basic developmental activities like constructions of hospitals and installations of electric poles too would be regarded as "red projects" in the area. A complete ban over the use of chemical fertilisers may harm agriculture and a complete ban on mining may make the most basic of construction activities difficult is what they contested. After rounds of discussions and a major contention by the Kerala government the Go I on March 2nd, 2017 finally notified 56,825 square kilometres of land as ecologically sensitive. This is a little lesser than the 59,940 square kilometres of area as identified by the Kasturirangan Panel. The reduction is due to the reassessed area in Kerala that brought down the total ecologically sensitive area in the state from the recommended 13,108 sqkms to 9993.7 square kilometres.

Conclusion

The demarcation of the area finally might have been done by the government, yet the success of environmental conservation would depend on the vigilant implementation of the law. The fear of the bureaucracy turning the whole regime into a licence raj seems very realistic. The fear of the traditional dwellers that the law would be yet another arm in the officialdom to extort money has to be suitably dispelled[38]. Further there are many issues as discussed earlier that have the potential of creating developmental issues. Multiple discussions have also demonstrated a lack of experience in Environment management. On many aspects both the committees appeared to be lacking in generating confidence on the good intent of sustainable development. This should act to be a good case study in future environmental management. The issue also establishes that the exclusionary principle of ecological conservation can be successful only to a limited extent and over a limited area. The burgeoning population and the pressure on the land needs the formulation of community based conservation programmes[11]. This underlying philosophy was instrumental in the enactment of Forest Rights Act 2006. The success of the present paradigm of Ecological sensitive zones too would depend on how effectively it allays the fear of exclusion from developmental opportunities that the nature provides to the dwellers.

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