

Environmental Sustainability Index: Sikkim

Increasing importance has been given to the integration of environment and economic development in policy-planning process. However, particularly in case of India, data deficiency clearly affects the policy making process. Lack of focused information about various sustainability issues, at state and national level, is not available to various stakeholders like policy makers, private sector, Non Governmental Organizations (NGOs), preventing any further sustainability analysis. Environmental Sustainability Index (ESI), developed by Centre for Development Finance attempts to address these issues of environmental sustainability. ESI, formulated primarily as a diagnostic tool for informing and empowering policy makers, citizens, researchers and activists, seeks to fulfil three main objectives. First, to provide information to ensure evidence-based policy making; second, to facilitate prioritisation of budget allocation between various resource sectors and lastly, to measure and monitor sustainable development at the state level over time.

This research project is an effort to map the current sustainability levels of the Indian states, while simultaneously projecting their ability to protect the environment in the future. Dimensions of sustainability are captured through forty-one indicators, culled from a wide range of themes such as air, water, land, forests, and impacts of pollution on ecosystem and human health and policy responses by various stakeholders. Based on the aggregate score, states are categorised into five groups: 'most' sustainable (top 20 percentile), 'more' sustainable (60-80 percentile), 'moderately' sustainable (40-60 percentile), 'less' sustainable (20-40 percentile) and 'least' sustainable (bottom 20 percentile).

Each state's environmental resources, capabilities and hence challenges differ from others. Hence the tool compares the states across six peer groups; created on the basis of GDP per capita and contribution to India's GDP. Sub index analysis of peer groups reveals a pattern; similar environmental issues are being faced by states with comparable growth trajectories. Consequently, a deeper analysis of successful sectoral policies is initiated to enhance knowledge about policy initiatives and outcomes at state level. In this context, this case let series aims to highlight initiatives (in terms of policy and implementation measures) taken by various state governments to tackle a plaguing environmental issue in their peer group.

This case let focuses on **Sikkim**, categorized under "*dark green*" state which signifies that it scores in the 80-100 percentile category. Sikkim has been in the forefront in conservation of natural resources and environmental initiatives. The Himalayan State leads the way in prioritising environmental conservation through policy level initiatives. The following sections provide a snapshot of ESI score and highlight some of the key policies and programs adopted by the State.

ESI Snapshot

ESI Group	Dark Green
Other states in same ESI group	Himachal Pradesh, Sikkim, Manipur, Mizoram, Arunachal Pradesh
% Contribution to overall India's GDP	0.06
SGDP per capita / annum	34343
% population living below poverty line	33.78
Population density per square km area	85

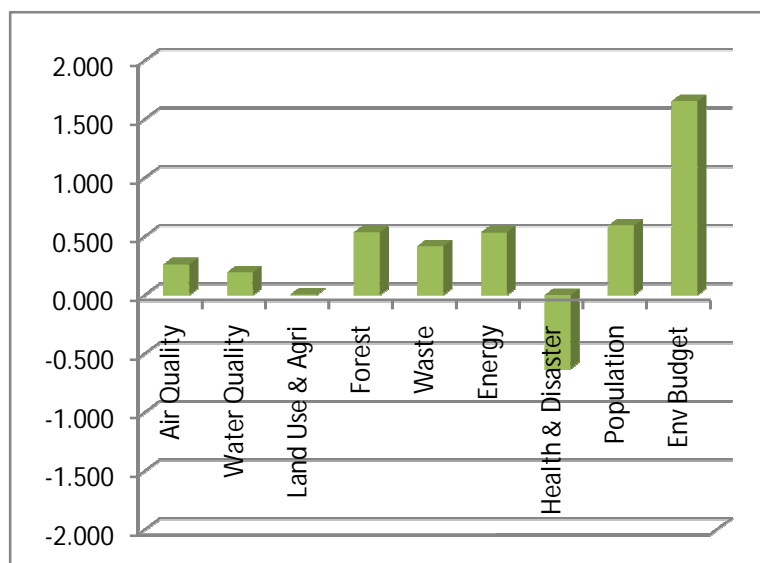


Figure 1 : ESI as per 9 sub indices

Columns that lie above the X axis depict a better than average performance (as compared to all 28 states). Columns that lie below the X axis depict a less than average performance (as compared to all 28 states). The height of a column indicates the degree to which a state has performed better or worse than others in that particular sub index. All values are in standardized scores. All sub indices are adjusted to ensure that higher values indicate better performance in that aspect of sustainability.

The spider chart shows the sustainability of states in terms of Driving Force-Pressure-State-Impact-Response. All values are standardized scores. Values farther from the centre indicate better performance. A state's higher positive score in 5 different components add up; and higher green area indicates better performance by the state in all components.

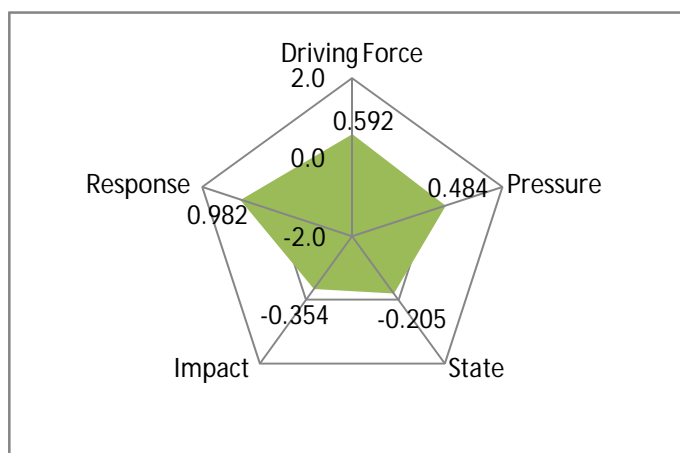


Figure 2: ESI as per DPSIR Framework

Introduction

The geographical area of Sikkim is approx. 7096 sq. km with a population density of 85.68 per sq. km. The figure, however, may be misleading since a major part of the state is covered with forests, which is not suitable for habitation. The forest cover of Sikkim constitutes around 47.31% of the state's geographical area. In terms of forest canopy density classes, the state has 500 sq. km very dense forest, 2161 sq. km moderately dense forest, and 696 sq. km open forest. Accordingly, despite not being suitable for habitation, these forests are integral to the development of the state. As evidenced by Figure 4, the forest cover in Sikkim has shown a steady increase from 37% in 1975 to 46% in 2005. Considering the severe natural environment of the northern part of Sikkim to grow trees, it is quintessential to increase the forest cover substantially in the near future for people living in the forest fringe area who are heavily dependent on the natural forest resources such as fuel wood for the source of energy, and fodder, medicinal plants, herbs for their own consumption.

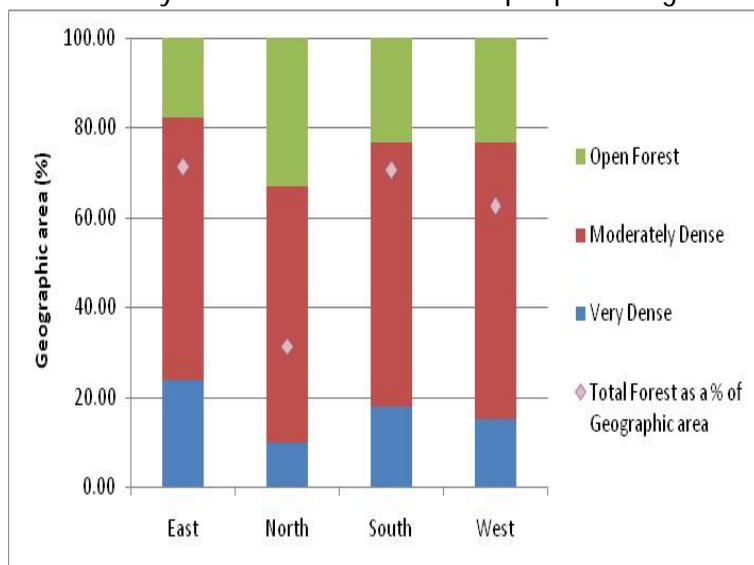


Figure 3: Forest Cover of Sikkim (Sikkim Government, 2007)

Sikkim is home to a diverse variety of flora and fauna in danger of extinction. Therefore, the preservation and protection of these natural assets is of vital importance. Any threat to the forests further endangers the biodiversity of the region. The abundant natural beauty of Sikkim also offers a good potential to attract foreign and domestic tourists, and is conducive to the setting up of tourist spots, home stays etc.

The point is further appreciated when it is realized that Sikkim has basically an agrarian economy and predominantly rural population (about 90% of total population). Two-third of the overall work force is dependent on agriculture and allied activities, with only 16% of geographical area available for cultivation. (Sikkim Government, 2007) Under such circumstances, tourism provides the State with a good source of revenue; much of it being derived

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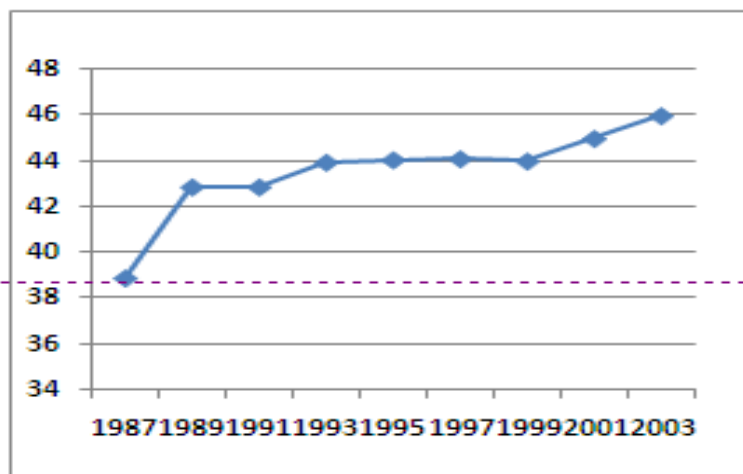


Figure 4: Forest Cover (%) of Geographical area of state (Government of Sikkim)

from the aesthetic beauty and wildlife sustained by the forests.

Threats to Forest Cover: Forest Fire

Forest Survey of India (FSI) in a country-wide study in 1995 estimated that about 1.45 million hectares of forest are affected by fire annually. According to an assessment of the Forest Protection Division of the Ministry of Environment and Forests (MoEF), Government of India (GoI), 3.73 million hectares of forests are affected by fires, annually in India. (National Disaster Management Division,GoI)

Forest fires are one of the biggest threats to the immense forest cover in Sikkim. Not long ago, in 2009, the state witnessed one of its worst forest fire crises. In 2009, the continuous dry spell in Sikkim had transformed the forest areas into virtual tinderboxes triggering as many as ten major forest fires in the 48 hours that had ravaged many reserved forests and wildlife sanctuaries across the State. (Roy) Tackling the fire could be very difficult in Sikkim as it usually takes four to five hours to reach the spot on foot from the nearest motor able road.

Considering the geographical location and the topographical features of the state, there is only a practical extent to which the road

network can be improved. Hectares of forest are still not speedily accessible. Therefore, the most efficient solution to the problem lies in its prevention. The state is taking an initiative to develop a forest fire management policy to focus on fire prevention aspects and to coordinate efforts by various agencies towards this important function. The policy integrates modern fire fighting approaches with community based fire fighting strategies. The same has been achieved through the Joint Forest Management Committees as well as the

Eco-Development Committees. Wherever required, assistance is also sought from the National Institute of Disaster Management and the Disaster Management Departments of locally situated universities.

In addition, the state is also actively implementing MoEF designed plan called 'Modern Forest Fire Control Methods'¹ by procuring hand tools, fire resistant clothes, fire-fighting tools, radios, fire watch towers, fire finders, creation of fire lines, research, training, and publicity on fire fighting. (National Disaster Management Division,GoI) Measures to create awareness regarding cause and prevention of forest fires amongst the local dependent population have been initiated by the state government and NGOs. Monetary incentives are also propagated by the FD to encourage public participation.

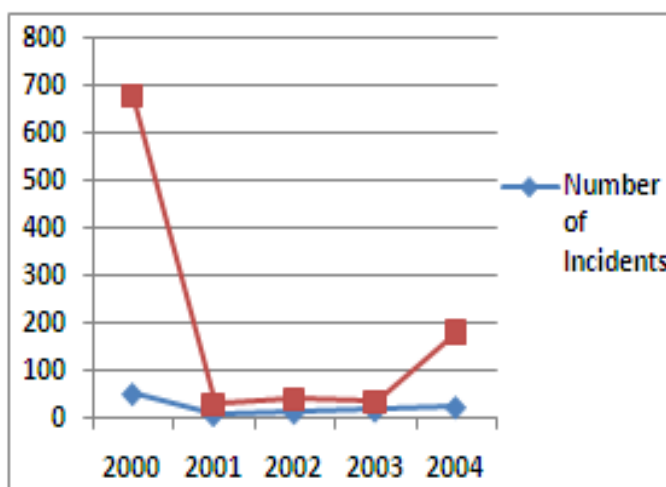


Figure 5: Forest Fire incidents in Sikkim (Government of Sikkim)

¹ An initiative by MoEF under which state governments are provided financial assistance for fire prevention and control

The policy also provides for zoning of the forests on the basis of their vulnerability, assessed ecological impacts and intrinsic value so that different treatments can be meted out to the different zones. In the year 2003-04 the forest details were recorded as given in Figure 5. Upon the identification of vulnerable zones, special efforts are being relied upon for greater input of recent technological advancements in the field of tree improvement, modern nursery techniques, modern forest fire fighting technology, improved communication system, use of remote sensing, geographical information system, and use of global position system.

Policies, Initiatives and Institutional Mechanisms

Ban on grazing

Pastoralism in the state started from the mid twentieth century, when trans-border yak herders from eastern Nepal started migrating and settled in the border villages of West Sikkim adjacent to KNP. In order to meet the growing demand for dairy products, the herd size increased resulting in high pressure on the fragile mountain eco-system.

To remedy the same, the state, in 1998, had imposed a ban on grazing within the Reserve Forest, Plantation areas and Water sources areas with a view to encourage regeneration of forest resources, augment rural water supplies and develop degraded lands. Since the time such initiatives were undertaken, forest cover in Sikkim have registered a substantial increase from 37.34% to 47.59% during this fifteen years from 1994 and 2010. (Forests, Environment & Wildlife Management Department, 2011) These are no mean achievements considering the fact that forest resources in many states of India and even the world are registering a serious decline.

However, this absolute ban has adversely affected the lives of the inhabitants- as reduction of available grazing areas has compelled many to cut down on their livestock consequently affecting livelihood. In response, the government is looking into the loss of livelihood, and also undertaking a studies pertaining to social and ecological impact of the ban. The initiative shall help device a better policy mechanism.

Joint Forest Management (JFM)

With every policy decision, or ecological scheme, it is the local people, well aware of the intrinsic details pertaining to climate, topography, vegetation, wildlife etc, who witness its actual impact. Their traditional knowledge may be utilized appropriately to have more accurate analyses, and therefore, better forest development programmes. Any initiative related to forest management must therefore involve local participation. It also guarantees them an alternative source of livelihood, and chance to explore opportunities, other than agriculture.

The Joint Forest Management model follows the same approach where the forest is managed through a partnership between the forest department and village people. It is based on mutual trust and cost sharing. The state has entrusted the JFMC with the task of afforestation and protection of the natural resources of their area and they will be implementing the National Afforestation Programme through the four FDAs in the Tenth Plan period (2002-2007). More than 10000 hectares of land will be developed over the Plan period through this scheme. Consequently, the strategy adopted stresses upon achieving its objectives through organized local participation. Forest decentralization and universalization is underway in Sikkim with the

constitution of more than 900 village based Joint Forest Management Committees. However, in order to rely upon the local communities, their participation must be preceded by various skill development programmes. The strategy throws up a mammoth task of capacity building and grass root infrastructural needs of the local community and forest staff in participatory approaches and forest management.

Decentralization of the state forestry sector gained momentum since 2002 with the formation of 155 Joint Forest Management Committees (JFMC) and 49 Eco-development Committees (EDC) and 7 Forest Development Agencies in the state till date. The state government had taken a decision, in 2006, to bring 907 Gram Panchayat Wards under the JFM network with the creation of 907 JFMC at the village level. The same village level JFMC was also to function as the village land use committee, watershed committee, biodiversity management committee, and implement all other forestry programmes of the state.

Adoption of participatory approaches towards forest protection, management and development has led to formation of EDCs and JFMCs at village level. Currently, there are 155 JFMCs which together form 4 territorial Forest Development Agencies (FDA) at the state level.

Sustainable eco-tourism

Since the last decade, Sikkim has become one of most sought after tourists destination. Having realized 'Tourism' as a major engine of economic growth, employment generator & poverty alleviator, the state Government has endorsed this sector as the main civil industry of the state. (Tourism Department, 2010)

As the figures indicate, more than 2.5 lakh domestic and 17,000 overseas tourists visited Sikkim in 2005; with the number of tourists visiting the Yuksam-Dzongri destination alone having increased from less than 2000 in 1990 to more than 4500 in 2005.

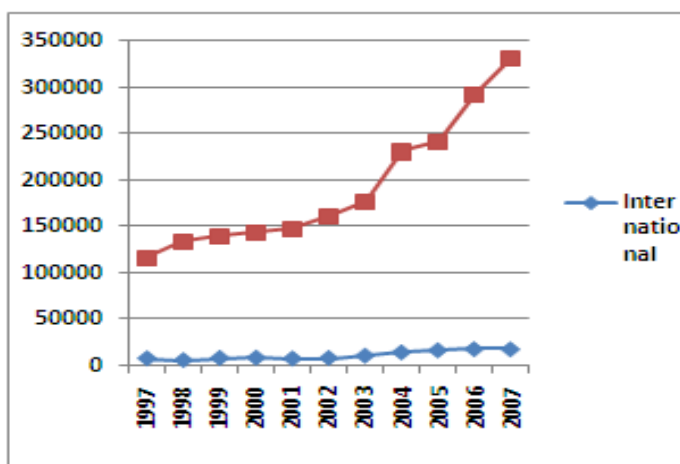


Figure 6: Tourist Inflow in Sikkim (Surbana Corporation Pvt. Ltd., 2008)

However, any increase in tourist activities poses the risk of substantial damage being caused to the natural resources of the territory. Therefore, apt emphasis is laid on the promotion of sustainable eco-tourism. In order to adhere to Sustainable Ecotourism, the state is attempting to implement the same through an ecotourism policy.

Ecotourism is promoted in Sikkim with two principal objectives as per Global Sustainable Tourism Criteria (GSTC):

- Providing income generation opportunities to local communities living in the forest fringe area, and
- Ensuring that the impacts of developing ecotourism do not damage the environment.

Accordingly, the process of drafting an Ecotourism policy is being held in a participatory manner with inclusion of all stakeholders- Minister, expert members as well as local and national level NGOs and Travel Agent Association of Sikkim (TAAS), Sikkim Association of Adventure Tour Operators (SAATO); thereby, reflecting the nature of policy formation being participatory. The Committee will formulate the policy with the public consultations at each district level, encouraging as much local participation as possible.

In lieu of increasing inflow of domestic and international tourists, the state is establishing an Ecotourism Marketing Cell (EMC) under the Sikkim Biodiversity Conservation and Forest Management Project in order to formulate a five-year Ecotourism Marketing Strategy and will be involved in implementing the same. The Government of Sikkim, along with numerous NGOs, have also been promoting home-stays as a convenient and affordable mode of accommodation. Innovative initiatives from the government, has made the state a major ecotourism destination in the region.

Sikkim Himalayan Home-stay Program is a unique programme supported by UNESCO, and implemented locally by Eco-tourism and Conservation Society of Sikkim (ECOSS). It seeks to combine the strengths of rural communities with the experiences of national and international groups who are leaders in the field of ecotourism and thereby contribute to the livelihood of the community. The promotion campaign is backed up by providing the inhabitants with adequate training in hospitality, cutlery etc.

10TH Five Year Plan

The 10th Five Year Plan (2002-2007) was a reflection of the need to lay more emphasis on biodiversity conservation. One of its objectives included the taking up of extensive afforestation measures, by planting more trees and enhancing the forest and tree areas to 25% by 2007 and 33% by 2012. (Economy Watch, 2011)

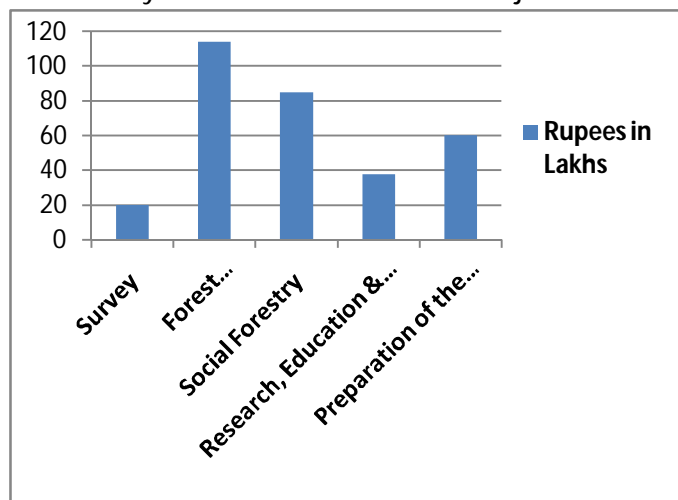


Figure 7: Monetary Allocation of the 10th Five Year Plan

associated initiatives. The Financial budget allocated to Forest Management was Rs 664.20 lakhs (Figure 7).

The monetary allocation is indicative of the attention that is being paid to the conservation of Bio-diversity through forest management. Simultaneously, an honest effort is being made to encourage local participation through the decentralization of authority.

Once again, since it was realized that without the support and co-operation of the people, forests cannot be protected, it endeavoured to encourage active participation of the local people by institutionalisation of people participation in protection and conservation of the forests and unique biodiversity of the state.

Keeping in mind the same, the size of the mentioned plan had allocated adequate funds to forest management and other

Sikkim Biodiversity Conservation and Forest Management Project (SBCFM)

The Department of Forests, Environment and Wildlife Management is implementing Japan International Cooperation Agency (JICA) assisted Sikkim Biodiversity Conservation and Forest Management Project. The project is for a period of ten years commencing from 2010-2011 to 2019-2020 at a total cost of Rs.330.57 Crores. Project activities will be conducted in three phases; preparatory phase, implementation phase, and closing phase.

The proposed measures to be undertaken, or that have already been initiated, to meet the prescribed objectives of the Project include conducting rapid biodiversity surveys, study of impact of climate change and grazing in the Himalayan region, enhancement of Working Plans and establishment of forest management zones etc.

Legislative Amendments

Policy making and initiation of environment-oriented schemes is the first step towards efficient and sustainable forest management. It ought to be followed by effective implementation, in compliance with the objective laid down. The increase in the forest cover of Sikkim over the past decade has been a consequence of such effective governance, local participation, and ensuring strict compliance to the law which was ensured through imposing strict penalties for the those violating the law.

The Sikkim Forests (Compounding of Offences) Rules, 1998 had been notified in time. This rule notified by the government is to make strict rules for offender who commits any forest offence, thereby keep a check on the offenders for violating the rules.

The State Government, thereafter, has brought about vital amendments in the present *Sikkim Forest Water Courses and Road Reserve (Preservation and Protection) Act, 1988 (Amendment 2000)* to make the specified clause more stringent and harsh in enforcement.

Offences such as illegal felling of trees, encroachment and grazing in the Reserve Forest have been made non-bailable. Other important initiatives, measures and actions taken are Intensification of Management & Protection. The overall management of forest land and forestry resources have been intensified by better patrolling, effective forest check posts, check on illegal extraction and transit of forest produce, reporting and recording of all forests offences and other information in Head quarter control room and Division control rooms, registration of forest cases, check on leakage of forest revenue and better communication system.

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