Biodiversity Conservation in India: Mapping Key Sources and Quantum of Funds

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Abstract

India being a signatory to CBD is mandated to achieve biodiversity targets according to a time line, which requires a credible action plan, funds, and a smart implementation strategy. While India has a National Biodiversity Action Plan, it lacks a Biodiversity Finance Policy/Plan ─ key to identifying, current funds flow, periodic and continuous additional finance needs as well as resource mobilization strategies. Biodiversity finance in India, is highly fragmented, lacks a clear policy and a road map. Multiple institutions are involved in directing finance often with overlapping functions and no systematic tracking. While a couple of studies have attempted to map the sources and quantum of funds towards biodiversity conservation, there is no comprehensive estimate of total budgetary funding in India for this purpose. This paper not only fills this gap but also estimates the flow of funds from externally aided projects and from corporate sector through CSR and other compliance mandates. The paper uses a modified 'Rio-marker' methodology and 'Budgetary data on Actual Expenditure' on biodiversity in the analysis thus contributes to both theoretical and empirical literature on the subject. The analysis shows that the majority of BD management is through government Budget support, supplemented by externally aided projects, corporate sector, and Civil Society. The paper shows that a template for tracking and tagging biodiversity expenditure is necessary in institutionalizing this process and thus moving towards a credible biodiversity finance plan.

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1. Introduction

Biodiversity refers to the variety and variability of life on earth and forms the foundation of a vast array of ecosystem services and contribute to human wellbeing.[2] It provides basic goods and services for the human society to exist and secure economic and social development.

Despite being vital for the survival of the planet, biodiversity is being increasingly threatened globally on account of various factors. Human activities are also placing severe pressure on biological resources thereby resulting in irreversible loss of biodiversity. The problem is further aggravated by undervaluation of biodiversity and ecosystem services by the markets, lack of understanding about the interconnectedness of different economic sectors with and their interdependence on biodiversity and about the co-benefits of investments in biodiversity conservation.

Recognizing biological diversity to be essential for sustainable development and human well-being, the Convention on Biological Diversity (CBD), adopted at the 1992 Earth Summit in Rio de Janeiro is the first global agreement among the countries of the world aimed at controlling and reversing the loss in biodiversity for the welfare and survival of the planet. It is a comprehensive, legally binding international agreement which addresses all aspects relating to biodiversity.[3] The Convention is implemented through programmes/strategic plans adopted by the Conference of Parties (CoP) to the CBD which are then incorporated in the National Biodiversity Action Plan (NBAP) by the Parties.

India, a mega diverse country with only 2.4 percent of the world's land area, harbours 7-8 percent of all recorded species, including over 47,000 species of plants and 96,000 species of animals. Of the 34 global biodiversity hotspots, four are present in India, represented by the Himalaya, the Western Ghats, the North-east, and the Nicobar Islands. However, country's biodiversity faces a variety of threats — caused by various anthropogenic activities — ranging from land use changes in natural habitats to overexploitation of natural resources, proliferation of invasive species, and climate change. For India, conservation of biodiversity is crucial also because it is directly linked with providing livelihoods and improving socio-economic conditions for millions of its inhabitants, thereby contributing to sustainable development and poverty alleviation. Hence, conservation of biodiversity should be a national priority and incurring expenditure towards biodiversity conservation a long-term investment for securing our own wellbeing.

India has been working towards protecting its biodiversity as it develops. It became a party to the CBD in February 1994 and developed a National Policy and Macro-level Action Strategy on Biodiversity in 1999 for defining policies and strategies for conservation and sustainable use of biological diversity in the country. As part of its obligations as signatory to the CBD, Government of India enacted the Biological Diversity Act in 2002 and associated Rules in 2004. The National Policy and Macro Level Action Strategy on Biodiversity was revised and updated into NBAP in 2008 to bring the biodiversity agenda in alignment with

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[2] It is defined as the variability among living organisms within species, between species, and between ecosystems. Biodiversity underpins the proper functioning of ecosystems and ensures the delivery of ecosystem services (World Economic Forum, 2010).
[3] The main objectives of the Convention are (a) conservation of biological diversity; (b) sustainable use of its components; and (c) fair and equitable sharing of benefits arising out of the utilisation of genetic resources.

the National Environment Policy of 2006. The NBAP 2008 was further updated with Addendum to NBAP 2008 in 2014 in order to integrate the Strategic Plan for Biodiversity 2011-20 (SPB 2011-20) adopted by CoP 10 at Nagoya, Japan into the NBAP.

The economic cost of biodiversity loss and ecosystem degradation has been estimated to be between USD 2 and 4.5 trillion (3.3-3.75% of global GDP).[4] It is estimated that globally around USD 52 billion is being spent on biodiversity annually (Parker et al, 2012) against an estimated annual financing need ranging between USD 150-440 billion.[5] Available evidence and decisions adopted by Parties to the CBD indicate that the current levels of investment in biodiversity management are inadequate to achieve the 20 Aichi Targets defined in the CBD's Strategic Plan for Biodiversity 2011-2020. Financing the gap between resource requirement and resources actually spent towards biodiversity conservation is a major challenge faced by countries/regions across the world. As a conservative estimate, India is spending approximately USD 2 billion annually on biodiversity conservation, but requires between USD 15-45 billion per year to sustain its efforts.[6]

Biodiversity encompasses multiple activities involving diverse sectors and several cross cutting issues. Hence, responsibility for maintaining and conserving biodiversity is confined not only to the Central Government, the role of sub-national states is equally important. How much money is being spent towards biodiversity conservation in India? How much is being spent by central government and how much by the state governments? Is this funding adequate or do we need more resources? Or do we need better utilization of the funds already committed for biodiversity conservation in the country? Such questions can be answered only if we have accurate and reliable estimates of funds that are currently being spent towards conserving biodiversity in the country. It is in this context that the present paper seeks to quantify expenditures towards biodiversity conservation in India. The paper bridges this gap and contributes to the literature by developing a methodology for estimating biodiversity attributable expenditures at the sub-national level in India. It quantifies biodiversity relevant expenditures for one of the large states in India – Maharashtra (which is endowed with rich and diverse ecosystems and biodiversity diversity) for the period 2011-12 to 2015-16. The proposed methodology can be applied for quantifying biodiversity relevant expenditure for any state in India.

The rest of the paper is organised as follows: section 2 discusses the global experiences relating to estimating/quantifying biodiversity relevant expenditures, estimating gaps in resources requirement and funds actually spent towards biodiversity conservation. Section 3 presents the approach and the methodology adopted for quantifying biodiversity relevant expenditures at the sub-national level in India. It also highlights the data sources used. Quantification of attributable expenditure for biodiversity conservation for the state of Maharashtra for the period 2011-12 to 2015-16 is presented in section 4. Mapping and quantification of biodiversity relevant expenditure from funds received through external sources is presented in Sections 5 while those received from the corporate sector under the corporate social responsibility (CSR) and on account of compliance with other regulations is presented in section 6. The all-state estimate of biodiversity relevant expenditure in India is

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[4] The Economics of Ecosystems and Biodiversity (TEEB), Cost of Policy Inaction Report, 2008

[5] High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020 (2012) - (HLP, 2012)

[6] India joins BIOFIN looking at financing options to reverse biodiversity loss. Available at https://www.biodiversityfinance.net/news-and-media/india-joins-biofin-looking-financing-options-reverse-biodiversity-loss

presented in section 7. Section 8 concludes by providing policy suggestions.

2. Literature Review

The decisions adopted by the Parties to the CBD indicate significant gaps in getting finance for biodiversity management. A preliminary assessment conducted by the High-level Panel on Global Assessment of Resources for Implementing the CBD Strategic Plan estimated that the global investment required for implementing the 20 Aichi Biodiversity Targets by 2020 would be between USD 150 and 440 billion annually (HLP, 2012). These estimates were derived through a simple addition of resource requirements identified for each of the 20 targets. However, these estimates need to be treated with caution. There are not many quantitative assessments that been made at the national or regional level of the resources needed to deliver biodiversity priorities. Although at the regional level, there exists some specific assessments of the resources needed to deliver the Aichi Targets.

At the national level, a recent study for Ecuador estimated the resource requirement for each of the Aichi targets to be around USD 4.6 billion. This is equivalent to USD 669.8 million annually over a period of 7 years or 19 percent of Ecuadorian national government's budget in 2013 (Albán et al, 2013). At the regional level, tens of billions of USD would be needed to meet biodiversity targets in the European Union (Secretariat of the Convention on Biological Diversity, 2014). From the wide range of estimates available for individual countries, regions and for various Aichi targets, it is important to piece together several fragmented evidence of costs of particular types of biodiversity action and different spatial scales in order to get an assessment of the total resource requirement (CBD High-Level Panel, 2014). For example the cost of establishing and maintaining protected areas (Aichi target 11) are estimated to be around USD 38 billion annually; similarly addressing the problem of deforestation (Aichi target 5) through REDD+ would require considerable sums of money ranging from USD 22 to 38 billion annually during 2010-2015 (Informal Working Group on Interim Finance for REDD, 2009)[7] to USD 17-33 billion per year for halving global emissions from the forest sector by 2030 (Eliasch, 2008). Similarly, there are evidences of resource requirement relating to other targets.

The second report of High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020 pointed out that the estimates at the global, regional and national levels all point to a substantial gap between the investments needed to deliver biodiversity targets and the resources currently allocated (CBD High-Level Panel, 2014). There is, therefore, a need to increase investments substantially to bridge the financing gaps. These findings are based on a range of studies assessing fund requirements and allocations (see studies by Parker et al. 2012; McCarthy et al. 2012; Gutman and Davidson 2008). There is evidence regarding substantial gaps between resources currently allocated to biodiversity action and those needed to fund the investments required to deliver Aichi Targets (HLP, 2014; Cao et al. 2009 for United Kingdom; FOEN, 2010 for Switzerland; Casey et al. 2008 for North America; Frazee et al. 2003 for Africa).

Despite available evidence indicating that the scale of benefits to the economy and

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[7] Report of the Informal Working Group on Interim Finance for REDD+. Available at https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=RDAPD7XD5383KM5UCPLJSK8408UFJSRA

society at local, regional and national levels of conserving biodiversity would far outweigh the resource requirement (Balmford et al. 2002; CBD High-Level Panel 2014; Pascal, 2011), there exists a considerable gap between the resources allocated towards biodiversity conservation and those needed.

For India assessment of availability of funds for biodiversity conservation was done for the first time by the Ministry of Environment and Forest (MoEF) for 2010-11. The total funding for biodiversity conservation for 2010-11 was estimated at Rs.11,077.13 crores (USD 1.46 billion[8]). This included funding from Government of India for core (direct and immediate biodiversity impact of MoEF programmes/schemes), net non-core (i.e., net of schemes of MoEF that are directly relevant to biodiversity)[9] and net peripheral funding flows (from biodiversity relevant 29 schemes of Ministries other than MoEF)[10] and also core funding by State Governments (MoEF, 2012). Using similar methodology, assessment of leverageable funds for biodiversity conservation was carried out for 2013-2014 during the reporting in India's Fifth National Report (NR-5) to the CBD and preparation of NBAP in 2014. The overall funding for biodiversity conservation in India for 2013-14 was estimated at Rs.9,204.45 crores (USD 1.21 billion)[11] (MoEF, 2014a; Onial, 2018). In another assessment of biodiversity relevant expenditure for India, Ansari et al (2018) examined expenditures by central government for the period 2012-13 to 2016-17. The study identified 116 schemes from 24 central ministries and 29 departments as biodiversity relevant and estimated that the average annual biodiversity attributable expenditure during this period was Rs.20,031.51 crore (USD 2.64 billion).[12] However, the total funds needed (at the central government level) to implement the NBAP and the 12 National Biodiversity Targets during 2012-13 to 2016-17 was estimated to be around Rs. 91,437 crores (USD 12 billion) annually (Soundarapandi, 2017).

At the sub-national level in India Bhattacharya and Bhattacharya (2019) provides a methodology for analysing public expenditure related to State Biodiversity Action Plan (SBAP) activities in the state of Punjab and finds the potential gaps to be fulfilled through external funding. The study uses data from Annual Financial Statement to assess state's budgetary allocations and expenditures that are directly and indirectly related to biodiversity; and appropriation accounts to determine biodiversity financing gap at the individual scheme level. The study estimates that Rs.124 crore (USD 16.32 million) has been spent by Punjab government in activities that are direct and indirect positive to biodiversity and ecosystem conservation but not covered under SBAP.

The paper uses a modified Rio-Marker methodology and budgetary data in estimating expenditure on biodiversity conservation at the sub-national level. The biodiversity expenditure estimates are further disaggregated following the taxonomy of biodiversity

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[8] We assume an exchange rate of USD 1 = Rs.76

[9] It includes schemes of MoEF that contribute to biodiversity conservation indirectly, viz., pollution, hazardous substances management etc. A multiplier approach was adopted to assess biodiversity relevant component.

[10] Since the entire amount allocated under such schemes cannot be attributed to biodiversity, a multiplier approach was used to assess the biodiversity component.

[11] The exercise included expanded datasets based on peripheral funding related to 77 schemes of 23 Ministries and Departments of Government of India in addition to direct-core and non-core funding by Ministry of Environment and Forests and core funding by State governments.

[12] It estimated that the total biodiversity attributable expenditure by central government was Rs.15,195.08 crore (USD 2.00 billion) in 2012-13 which increased to Rs.16,148.31 crores (USD 2.12 billion) in 2014-15 and further to Rs.27,716.56 crores (USD 3.65 billion) in 2016-17.

conservation provided by the CBD to reflect the focus and progress on Aichi and national targets. The paper thus contributes to the literature by way of methodological improvement and the level at which this analysis has been attempted before in India and many other countries. Besides, the paper provides estimates of biodiversity focus in externally aided projects and expenditure by corporate sector through mandated CSR and compliance with other regulations for the first time in India and as far as we know in any other CBD country.

3.   Approach, Methodology and Data Sources

The broad approach adopted in the paper is inspired by the BIOFIN workbooks (UNDP, 2014, 2018). For basic concepts, definitions and scope of biodiversity conservation, management, restoration, and protection we have followed the CBD decisions and technical documents[13] and the NBAP of India.

The sources of financing biodiversity expenditure in India comprises

1) Public Sources: These include
   a) Funds from the Union Budget: Releases by the Union government through its ministries/departments;
   b) Funds from State Budget: Expenditure by state governments through line departments;
   c) Funds from District Budget: Expenditure through district plan schemes;
   d) Funds from Local governments (rural and urban): Expenditures from their own funds;
   e) Funds from Other sources: Grants from Union Finance Commission; funds from Compensatory Afforestation Fund Management and Planning Authority (CAMPA); and grants from National Biodiversity Authority (NBA) to State Biodiversity Boards (SBB).

2) External Sources: Grants, loans and other technical assistance to government by multi-lateral and bilateral organisations and foreign governments.

3) Corporate Sector: Expenditure by corporate sector
   a) as per the Corporate Social Responsibility mandate, and
   b) on account of compliance with other environmental regulations and business case.

4) Civil Society Organisations (CSOs) and Philanthropic Institutions: Expenditure by CSOs and private trusts.

The paper maps and estimates biodiversity relevant expenditure from public sources for the state of Maharashtra in India.[14] Resources from governments - union, state and local are the most important source of financing biodiversity conservation in India. The paper uses data for the period 2009-10 to 2015-16 for quantifying biodiversity relevant expenditures in the state. We use the estimates of biodiversity relevant expenditure for Maharashtra to derive

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[13] https://www.cbd.int/convention/text/

[14] Maharashtra is a large state and is truly a representative state as it has large coastal area, natural forests and houses various biodiversity and ecosystems unique to India. Besides it was chosen as one of the pilot states as part of the BIOFIN study in India

estimates of biodiversity relevant expenditures from public sources aggregated across all states.

The paper also estimates expenditure on biodiversity from funds received under externally aided projects and by corporate sector through their corporate social responsibility mandate. Since these estimates are for all India we add these to all-state biodiversity expenditure estimates to derive estimates of expenditure on biodiversity from big potential spenders in India.

The methodology adopted in the paper for estimating biodiversity relevant expenditure at the sub-national level government in India is an improvement over the methodology used by Bhattacharya and Bhattacharya (2019). Given that biodiversity primarily forms part of the concurrent list (or List III) of the Seventh Schedule of the Indian Constitution, both the union and state governments share the responsibilities for its protection, conservation and maintenance. As a result both Union and state governments spend money towards conservation of biodiversity through various schemes. The union government has a number of centrally sponsored schemes (which were co-funded by the states) through which funds were spent towards biodiversity conservation. Till 2014-15 a sizeable proportion of central transfers to states under various centrally sponsored schemes (i.e., Central Government's share in these schemes) would go directly to the implementing agencies in states bypassing the state budgets.[15] As a result the state budget will only report state government's share in these schemes and not capture the central government's share. Any analysis based on annual financial statement of the state or appropriation account, as was done by Bhattacharya and Bhattacharya (2019) will not fully capture the total central funds spent under different schemes in the state. The methodology adopted in the current paper addresses this shortcoming thereby contributing to the literature in terms of methodological development for mapping as well as estimating biodiversity relevant expenditure in India.

It is important to mention here that since this assessment of expenditure on biodiversity conservation is one of the first exercise of its kind for India, collation of biodiversity-disaggregated data from the existing budgetary statistics and other sources posed considerable challenge which, in turn, contributed a great deal in shaping the methodology used in the paper.

3.1   Mapping Public Expenditure for Biodiversity Conservation in Maharashtra

3.1.1   Central Funds to Maharashtra

Central fund flows to sub-national states in India are in the form of Centrally Sponsored Schemes, Central Sector Schemes, Normal Central Assistance, Additional Central Assistance, and Special Central Assistance on the plan side and non-plan grants from various central ministries. While some of these schemes are fully funded by the Union Government, others are co-funded by state governments. The share of state governments in such schemes is not uniform and varies across schemes.[16]

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[15] This practice was, however, discontinued from 2015-16. From 2015-16 all central scheme funds to states started flowing through the state budgets.

[16] In 2015-16, central schemes to states were restructured. This restructuring involved reducing the number

We reviewed the guidelines of each of these schemes and identified those that had activities/ components directly or indirectly relevant for biodiversity conservation. Since scheme-wise expenditure data for the identified central schemes for Maharashtra was not readily available, we used data on central releases to Maharashtra (only Central Government's share) for each of the identified schemes as a proxy for expenditure.[17] This data was collected from the Ministry of Finance, Government of India for the period 2009-10 to 2015-16. Data on State's share under these schemes was obtained from respective line departments, Government of Maharashtra[18].

3.1.2   Maharashtra State Funds

In addition to Central fund flows to Maharashtra, the State government has a number of schemes funded entirely from its Consolidated Fund. List of these schemes was taken from the Annual Plan Document and Budget documents of Government of Maharashtra. Scheme specific guidelines were used to identify schemes that had activities/components directly or indirectly relevant for biodiversity conservation. Actual expenditure under each of the identified scheme was compiled from the budget documents of Maharashtra for the period 2009-10 to 2015-16.

3.1.3   District Level Funds in Maharashtra

District Development Plan, prepared by consolidating the development plans of local bodies (rural and urban) in the district, is financed by resources from the District Plans of the State Government, various schemes/programmes of Central Government and scheme specific State funds which are directed to districts.

Two districts were selected - Ratnagiri and Chandrapur. For the selected districts, District Planning Department provided details of District Plan schemes operational in their respective districts.[19] Biodiversity relevant schemes were identified in consultation with district officials and scheme specific guidelines. Data on expenditure under these schemes for 2009-10 to 2015-16 was collected from published sources and in-person meetings with the concerned district officials.

While selecting Central, State and District Schemes utmost care was taken to avoid double counting of expenditure. For example, if a Central/State scheme is operational in the district we have not considered it in the district expenditure. Similarly, state's share in central schemes is not considered as part of state government's expenditure.

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of schemes, changing their sharing pattern etc. For more details see Chakraborty and Gupta (2016).

[17] It is assumed that funds once released by Central Government will be spent by the State. If the state is not able to spend these funds, releases of subsequent instalments will be stopped. Thus we have used releases as a proxy for expenditures.

[18] Line departments vetted the data provided by Ministry of Finance, Government of India on scheme-wise releases of Central government's share to Maharashtra.

[19] Only those schemes which were financed entirely by the District plan were considered.

3.1.4 Funds from Other Sources

Grants from Union Finance Commission[20]: Recognizing the special role of forest wealth, the Twelfth FC was the first FC to provide a grant of Rs.1000 crore, spread over its award period 2005-10, to states for maintaining forest cover. The forest grant was distributed across states in accordance with the forest share (acreage) of the states in the country (Finance Commission, 2004). The Thirteenth FC enhanced the quantum of its forest grant to Rs.5000 crore for its award period 2010-15. (Finance Commission, 2009). The Fourteenth FC incentivized the states for maintaining forest cover by including forest cover as one of the criteria for determining states' share in divisible tax pool for its award period 2015-20. The Commission had used share of states in total moderately and very dense forest as one of the criteria in its tax devolution formula and assigned a weight of 7.5 percent to forest cover (Finance Commission, 2014). However, unlike the previous two FCs it did not provide any grants for forests.[21]

Data on forest grants released to Maharashtra during 2009-10 to 2015-16 was provided by Ministry of Finance, Government of India. Since Fourteenth FC did not recommend any forest grant, there were no releases in 2015-16.

CAMPA Funds: The Forest (Conservation) Act, 1980 requires that when forest land is diverted for non-forest use, the user agency must undertake compensatory afforestation[22] on non-forest land equal to the size of the forest being diverted. However, since afforested land takes a long time to become a forest, to compensate for the loss in the interim, the law requires that the Net Present Value (NPV) of the diverted forest be calculated for a period of 50 years, and recovered from the user agency.

These payments flow into a fund which is maintained and managed by the Compensatory Afforestation Fund Management and Planning Authority (CAMPA). There was until recently in place, an ad hoc CAMPA[23] which had been authorized to release about Rs. 1000 crore annually to the respective states in proportion to jurisdictional collections. Data on funds

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[20] Finance Commission (FC) is a constitutional body set up by the President of India (under Article 280 of the Constitution) every five years. Its primary task is determining the sharing of centrally collected tax revenues between the Union and state governments, and distribution of grants-in-aid of revenues across states. The first FC constituted in November 1951 covered the five-year period from 1952 to 1956. Since then, there have been fourteen FCs. The Fifteenth FC which is currently at work will cover the period 2020-26.

[21] The Fifteenth FC in its report for 2020-21 adopted the approach of the Fourteenth FC and did not recommend any grant for forests. The Commission used share of states in total moderately and very dense forest as one of the criteria in its tax devolution formula and assigned it a weight of 10 percent (Finance Commission, 2020).

[22] User agencies, which are often private parties, are not expected to undertake afforestation work themselves. This work has to be done by the state government, but the entire expenditure on creating this 'new forest' including purchase of land for the purpose has to be borne by the user agency.

[23] The Compensatory Afforestation Fund (CAF) Bill was passed by the Indian Parliament in August 2016 while the Compensatory Afforestation Fund Rules, 2018 were notified on 10 August 2018. The states are now free to use the remaining accumulated funds lying with the ad hoc CAMPA. The Union Government on 29 August 2019 released Rs. 47,436 crores of CAMPA funds to the states. It is hoped that this money would be used to regenerate forest and undertake conservation activities in states.

released to Maharashtra during 2009-10 to 2015-16 was taken from the CAMPA website.[24]

Grants from National Biodiversity Authority to Maharashtra State Biodiversity Board:
Maharashtra State Biodiversity Board (MSSB), established in January 2012 receives grants
from NBA to carry out its mandate. While data on these grants were obtained from MSBB's
annual reports, discussions with the Board's officials helped in tracking funds spent on
biodiversity related activities.

3.2 Determining Expenditure Attributable to Biodiversity Conservation in Maharashtra

Having identified schemes/activities that have biodiversity relevant component and
collected data on flow of resources from public sources to Maharashtra, the next step is to
determine biodiversity relevant expenditure under each of the identified schemes/activities.
This involves

a) Defining the scope of biodiversity-related activities. While the definition and scope of
    biological diversity used here is as provided by the CBD, the scope of biodiversity related
    activities is inspired by the NBAP of India, BIOFIN Workbook, and the existing literature
    on classification of activities (e.g., Classification of Environmental Protection Activities
    and Expenditure; Classification of Environmental Activities; and BIOFIN classification).

b) The relevance of identified schemes with respect to their impact on biodiversity is not
    uniform. While some schemes have a direct bearing on biodiversity, others may indirectly
    impact it. In terms of relevance, when the primary purpose of a scheme/activity is
    biodiversity conservation we have classified it as 'Direct'; but when biodiversity
    conservation is a significant but not the primary objective the schemes/activity is
    categorized as 'Indirect'. Activities/schemes categorized as 'Indirect' have been further
    classified into (i) Indirect high, (ii) Indirect medium and (iii) Indirect low relevance,
    reflecting varied levels of contributions towards conservation of biodiversity (table 1).

Expenditure under schemes/activities classified as 'direct' is conceptualized to be fully
attributed to biodiversity. For schemes categorized having 'Indirect' relevance, a system of
expenditure attribution (i.e., coefficients/proportion of expenditure attributable to
biodiversity conservation) needs to be established. We have considered three scenarios for
deriving biodiversity attributable expenditures. These are presented in table 1.

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[24] http://egreenwatch.nic.in/

Table 1: Determining Attribution for Biodiversity Expenditures

Biodiversity Relevance	Criteria	Expenditure Attributable to Biodiversity Conservation		
		Scenario 1	Scenario 2	Scenario 3
Direct	Where the primary purpose scheme is biodiversity conservation. **Examples**: Tiger conservation, afforestation, etc.	100%	100%	100%
Indirect High	Where conservation of biodiversity is a significant objective. **Example**: National Project on organic farming, etc.	50%	Average of the range 50%-75% (i.e., 62.5%)	Data on activity-wise expenditure incurred is obtained.
Indirect Medium	Where biodiversity conservation is an important objective and significant biodiversity relevant outcomes are expected. **Example**: Water conservation, National project on management of soil health & fertility, etc.	25%	Average of the range 25%-50% (i.e., 37.5%)	Data on activity-wise expenditure incurred is obtained.
Indirect Low	Where biodiversity conservation is a by-product. **Example**: renewable energy, general awareness and training, etc.	2.5%	Average of the range 0%-25% (i.e., 12.5)	Data on activity-wise expenditure incurred is obtained.

Source: Authors' construct

In the three scenarios considered, for schemes whose primary objective is biodiversity conservation and have direct relevance to biodiversity, we have attributed their entire expenditure towards biodiversity conservation. For schemes classified under Indirect-high, indirect-medium, and Indirect-low respectively, 50 percent, 25 percent and 2.5 percent of their expenditures are considered to be biodiversity relevant under Scenario 1.

Under Scenario 2, for schemes having Indirect-High relevance we have assumed that the percentage of expenditure attributable for biodiversity would range between 50-75 percent. Taking the midpoint of 50 and 75 we get 62.5 percent. In other words, for schemes having Indirect-high relevance 62.5 percent of their expenditure is attributable for biodiversity. Similarly for schemes having Indirect-Medium and Indirect-Low relevance we have considered biodiversity attributable expenditure to be 37.5 percent (average of 25-50 percent) and 12.5 percent (average of 0-25 percent) of their expenditures respectively.

Under scenario 3, for schemes categorized as having Indirect High, Medium and Low relevance, it is proposed to collect information on different activities and related expenditures that are being undertaken under each of the schemes in Maharashtra. The next step is to assign appropriate coefficients to each of the biodiversity relevant

activity to arrive at attributable expenditures separately for each scheme. This will help in estimating biodiversity relevant expenditures more accurately and the attributable coefficients will be closer to reality. This scenario could not be adopted due to non-availability of activity-wise expenditure data for most of the schemes. However, for three big central schemes, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), National Horticultural Mission (NHM) and Integrated Watershed Management Program (IWMP) for which we could get activity-wise expenditure data for Maharashtra, appropriate coefficients were applied to different activities to derive biodiversity attributable expenditure. The attributable coefficients thus obtained are different from those assumed under scenarios 1 and 2 (table 2).

Table 2: Attributable Expenditure under Select Central Schemes (%)

Schemes	Scenario 1	Scenario 2	Scenario 3
MGNREGS	50.00	62.50	41.21
NHM	2.50	12.50	10.53
IWMP	50.00	62.50	33.03

Source: Authors' calculations

Apart from classifying schemes into Direct and Indirect Biodiversity relevance, the identified schemes are also classified into six themes following the taxonomy of biodiversity conservation provided by the CBD to reflect the focus and progress on Aichi and national targets. These are: (i) Sectoral Mainstreaming, (ii) Natural Resource Use, (iii) Biodiversity Protection, (iv) Biodiversity Restoration, (v) Access and Benefit Sharing, and (vi) Enhancing Implementation. The next step is to align thematic classification with NBAP targets, Aichi targets and CBD goals. The classification of schemes/programs is illustrated in Table 3.

Table 3: Classification of Projects & Programs: Guidance Documents

	Strategic Goal A	Strategic Goal B	Strategic Goal C	Strategic Goal D		Strategic Goal E
CBD Strategic Goal	Address underlying causes of biodiversity loss by mainstreaming biodiversity	Reduce direct pressures on biodiversity and promote sustainable use	Improve status of biodiversity by safeguarding ecosystems species and genetic diversity	Enhance benefits to all from biodiversity and ecosystem services		Enhance implementation through participatory Planning, knowledge management and capacity building
NBTs	NBTs (1,2,10)	NBTs (3,4,5,6)	NBTs (6,7)	NBTs (3,8,9)		NBTs (10,11,12)
Aichi Targets	1,2,3,4	5,6,7,8,9,10	11,12,13	14,15,16		17,18,19,20
BIOFIN Taxonomy	Biodiversity Mainstreaming	Sustainable use of Resources except	Protection Strategies	Restoration	ABS (Aichi	Implementation Strategies

	Strategic Goal A	Strategic Goal B	Strategic Goal C	Strategic Goal D		Strategic Goal E
		Prevention & Control of invasive species (Aichi Target 9 & NBT4) which are taken as Protection Strategies		strategies	Target 16 and NBT 9)	
Impact on Biodiversity	INDIRECT	INDIRECT in most cases, except Aichi Target 9 & NBT4	DIRECT	DIRECT in most cases except when it is a very small component	DIRECT	• INDIRECT • DIRECT: when implemented by MOEF&CC; There can be some deviations

Source: Authors' construct

4. Attributable Expenditure for Biodiversity Conservation: Findings for Maharashtra

4.1 Central Government Releases to Maharashtra (inclusive of State's share)

A snapshot of the flow of central funds to Maharashtra is presented in table 4. Of the large number of central schemes that were in operation in Maharashtra during 2009-10 and 2015-16 not many had biodiversity relevant activities/components. Their numbers varied between 42 and 52 and accounted for about 25-39 percent of total expenditure of central schemes in operation in the state. The biodiversity relevant schemes are categorized into BIOFIN thematic areas based on biodiversity taxonomy. We find that most of the biodiversity relevant central schemes in Maharashtra are for Sectoral Mainstreaming and Enhancing Implementation (table 5). However, if one were to consider the share of schemes in total attributable expenditure, the share of schemes for Sectoral Mainstreaming is the highest followed by schemes for Natural Resource use.[25] Although the number of schemes for Enhancing Implementation is high, their contribution in the attributable expenditure is low.

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[25] The results are not reported, but can be had from the authors.

Table 4: Central Scheme Funds for Maharashtra

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Central Schemes to Maharashtra (No.)	294	300	294	276	288	266	262
Biodiversity Relevant Schemes (No.)	53	50	49	45	44	42	52
Central Scheme funds (Rs. Crore)	17513.5	19298.4	26183.5	22094.7	21829.5	21556.9	20518.6
Expenditure under Biodiversity Relevant Schemes (Rs. Crore)	5650.1	6736.3	10094.5	7752.2	7023.8	5340.6	5717.6
Expenditure under biodiversity relevant schemes (% of all schemes)	*32.26*	*34.91*	*38.55*	*35.09*	*32.18*	*24.77*	*27.87*
Attributable Expenditure (Rs. Crore)							
a) Scenario-1	894.7	953.4	1662.3	1659.3	1314.7	927.1	1374.1
b) Scenario-2	1514.9	1684.4	2766.3	2521.9	2082.2	1501.5	2009.9
Attributable expenditure as % of Biodiversity Relevant expenditure							
a) Scenario-1	*15.83*	*14.15*	*16.47*	*21.40*	*18.72*	*17.36*	*24.03*
b) Scenario-2	*26.81*	*25.00*	*27.40*	*32.53*	*29.64*	*28.11*	*35.15*
Attributable Expenditure as % of Total Scheme Expenditure							
a) Scenario-1	*5.11*	*4.94*	*6.35*	*7.51*	*6.02*	*4.30*	*6.70*
b) Scenario-2	*8.65*	*8.73*	*10.57*	*11.41*	*9.54*	*6.97*	*9.80*

Source: Authors' calculations

Table 5: Distribution of Central Schemes based on Biodiversity Taxonomy

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Sectoral Mainstreaming	18	16	16	17	16	17	23
Natural Resource Use	7	8	7	8	8	7	11
Protection	6	5	5	4	4	3	4
Restoration	2	1	1	0	0	1	1
Access & Benefit sharing	3	3	3	3	4	2	2
Enhancing implementation	17	17	17	13	12	12	11
Total	**53**	**50**	**49**	**45**	**44**	**42**	**52**

Source: Authors' calculations

Applying attribution coefficients (as discussed in earlier) we derive biodiversity attributable expenditure for central schemes in Maharashtra (table 6). Schemes having Indirect-Medium relevance account for most of the total attributable expenditure followed by schemes with Indirect-High relevance under scenario-1.

However, under scenario-2, the share of schemes with Indirect-High relevance is the highest. Share of schemes which have direct relevance for biodiversity in the total attributable expenditure is low under both the scenarios.

Table 6: Biodiversity Attributable Expenditure for Central Schemes in Maharashtra

(Rs. Crore)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Scenario-1							
Direct	57.39	70.27	81.50	22.84	68.94	82.98	69.47
(% of Total)	*6.41*	*7.37*	*4.90*	*1.38*	*5.24*	*8.95*	*5.06*
Indirect High	297.19	420.75	903.23	1275.02	840.10	527.60	1026.72
(% of Total)	*33.22*	*44.13*	*54.34*	*76.84*	*63.90*	*56.91*	*74.72*
Indirect Medium	461.25	351.99	524.89	257.73	304.16	234.98	208.97
(% of Total)	*51.56*	*36.92*	*31.58*	*15.53*	*23.14*	*25.35*	*15.21*
Indirect Low	78.83	110.41	152.68	103.71	101.45	81.56	68.97
(% of Total)	*8.81*	*11.58*	*9.18*	*6.25*	*7.72*	*8.80*	*5.02*
Total	**894.66**	**953.43**	**1662.29**	**1659.30**	**1314.65**	**927.12**	**1374.13**
Scenario-2							
Direct	57.39	78.39	86.52	23.00	68.60	81.66	68.20
(% of Total)	*3.79*	*4.65*	*3.13*	*0.91*	*3.29*	*5.44*	*3.39*
Indirect High	371.48	525.94	1129.03	1593.78	1050.13	659.49	1283.40
(% of Total)	*24.52*	*31.22*	*40.81*	*63.20*	*50.43*	*43.92*	*63.85*
Indirect Medium	691.87	527.99	787.34	386.60	456.24	352.47	313.46
(% of Total)	*45.67*	*31.35*	*28.46*	*15.33*	*21.91*	*23.48*	*15.60*
Indirect Low	394.17	552.07	763.38	518.55	507.25	407.82	344.86
(% of Total)	*26.02*	*32.78*	*27.60*	*20.56*	*24.36*	*27.16*	*17.16*
Total	**1514.91**	**1684.38**	**2766.27**	**2521.93**	**2082.21**	**1501.45**	**2009.91**

Source: Authors' calculations

The share of biodiversity attributable expenditures in total expenditure under biodiversity relevant central schemes in Maharashtra ranged between 14-24 percent under Scenario-1, and 25-35 percent under scenario-2. However, their shares in total expenditure of all central schemes in Maharashtra ranged between 4.30-7.51 percent under scenario-1 and 6.97-11.41 percent under scenario-2 (table 4).

4.2   Maharashtra State Schemes

Despite existence of a large number of biodiversity relevant schemes funded entirely from the Consolidated Fund of Maharashtra, their share in total expenditure of the state government is very low, varying between 1.10 - 2.36 percent (table 7). Distribution of schemes based on biodiversity thematic classification show large number of state schemes falling under Natural Resource use and Enhancing

Implementation categories (table 8)[26].

Table 7: Maharashtra State Scheme

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Biodiversity Relevant State Schemes (Nos.)	100	209	214	191	225	227	167
Total Expenditure (Rs. Crore)	113605.7	125381.8	142270.0	157549.9	176568.0	198217.1	237327.4
Expenditure under Biodiversity relevant schemes (Rs. Crore)	1245.59	1488.73	2427.59	2586.51	2306.89	4677.18	3765.71
Biodiversity relevant expenditure (as % of total expenditure)	*1.10*	*1.19*	*1.71*	*1,64*	*1.31*	*2.36*	*1.59*
Attributable Expenditure (Rs. Crore)							
a) Scenario-1	609.76	661.60	1075.15	1074.68	1063.60	1514.91	1590.45
b) Scenario-2	744.88	824.10	1343.16	1350.39	1305.71	2070.10	1964.16
Attributable expenditure as % of total expenditure of Maharashtra							
a) Scenario-1	*0.54*	*0.53*	*0.76*	*0.68*	*0.60*	*0.76*	*0.67*
b) Scenario-2	*0.66*	*0.66*	*0.94*	*0.86*	*0.74*	*1.04*	*0.83*
Attributable Expenditure as % GSDP of Maharashtra							
a) Scenario-1	*0.07*	*0.06*	*0.09*	*0.08*	*0.07*	*0.09*	*0.08*
b) Scenario-2	*0.09*	*0.08*	*0.11*	*0.10*	*0.09*	*0.12*	*0.10*

Source: Authors' calculations

Table 8: Distribution of State Schemes based on Biodiversity Taxonomy

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Sectoral Mainstreaming	13	34	33	28	30	32	24
Natural Resource Use	38	69	76	66	81	84	67
Protection	16	28	27	25	29	40	23
Restoration	10	24	23	18	24	16	15
Access & Benefit sharing	0	1	1	1	1	2	1
Enhancing implementation	23	53	54	53	60	53	37
Total	**100**	**209**	**214**	**191**	**225**	**227**	**167**

Source: Authors' calculations

Applying attributable coefficients we derive biodiversity attributable expenditures. State schemes having Indirect-high relevance account for the highest share in total attributable expenditure during 2009-10 and 2015-16 (table 9). However, in 2014-15 contribution of schemes having Indirect-Medium reliance is higher. Biodiversity attributable expenditures under state schemes as percent of total expenditure of government of Maharashtra range between 0.53-0.76 percent under

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[26] Considering the share of schemes in attributable expenditure we find that the share of schemes under Natural Resources is the highest (results not reported).

scenario-1 and between 0.66-1.04 percent under scenario-2 (table 7). As percentage of state's GSDP their share is negligible ranging between 0.06-0.12 percent.

Table 9: Biodiversity Attributable Expenditure - State Schemes

(Rs. Crore)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Scenario-1							
Direct	156.86	153.08	217.05	268.03	306.20	146.67	578.88
(% of Total)	*12.59*	*10.28*	*8.94*	*10.36*	*13.27*	*3.14*	*15.37*
Indirect High	757.88	858.80	1520.87	1415.87	1315.97	1343.00	1746.75
(% of Total)	*60.85*	*57.69*	*62.65*	*54.74*	*57.05*	*28.71*	*46.39*
Indirect Medium	291.93	298.64	357.45	338.45	365.76	2742.47	454.18
(% of Total)	*23.44*	*20.06*	*14.72*	*13.09*	*15.86*	*58.64*	*12.06*
Indirect Low	38.92	178.21	332.23	564.15	318.96	445.05	985.89
(% of Total)	*3.12*	*11.97*	*13.69*	*21.81*	*13.83*	*9.52*	*26.18*
Total	**1245.59**	**1488.73**	**2427.59**	**2586.51**	**2306.89**	**4677.18**	**3765.71**
Scenario-2							
Direct impact	156.86	153.08	217.05	268.03	306.20	146.67	578.88
(% of Total)	*21.06*	*18.58*	*16.16*	*19.85*	*23.45*	*7.08*	*29.47*
Indirect High	473.68	536.75	950.54	884.92	822.48	839.37	1091.72
(% of Total)	*63.59*	*65.13*	*70.77*	*65.53*	*62.99*	*40.55*	*55.58*
Indirect Medium	109.47	111.99	134.04	126.92	137.16	1028.43	170.32
(% of Total)	*14.70*	*13.59*	*9.98*	*9.40*	*10.50*	*49.68*	*8.67*
Indirect Low	4.86	22.28	41.53	70.52	39.87	55.63	123.24
(% of Total)	*0.65*	*2.70*	*3.09*	*5.22*	*3.05*	*2.69*	*6.27*
Total	**744.88**	**824.10**	**1343.16**	**1350.39**	**1305.71**	**2070.10**	**1964.16**

Source: Authors' calculations

4.3 Schemes in Selected Districts of Maharashtra

We selected two districts in Maharashtra, Chandrapur (located in the eastern part of the state) and Ratnagiri (a coastal district located in the south-west part of Maharashtra) to quantify biodiversity relevant expenditures at the district level in states. The number of biodiversity relevant schemes in the two districts and the biodiversity attributable expenditures is presented in table 10. Distribution of schemes based on biodiversity thematic classification show district schemes to focus on sectoral mainstreaming, restoration and protection aspects of biodiversity conservation.[27]

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[27] The distribution of district schemes based on BIOFIN thematic classification and attributable expenditures are not reported but are available with the authors.

Table 10: Summary of Biodiversity Relevant Schemes in Two Districts in Maharashtra

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Ratnagiri							
Biodiversity relevant schemes (No.)	12	12	16	17	17	19	19
Attributable Expenditure (Rs. Crore)							
a) Scenario 1	2.71	2.47	3.50	2.96	4.68	5.72	6.00
b) Scenario 2	3.81	3.37	4.57	4.07	6.24	8.03	8.38
Chandrapur							
Biodiversity relevant schemes (No.)	16	16	15	16	20	18	20
Attributable Expenditure (Rs. Crore)							
a) Scenario 1	1.89	3.79	3.99	6.28	6.78	11.31	19.16
b) Scenario 2	2.45	4.55	4.72	7.72	7.87	12.49	21.43

Source: Authors' calculations

Maharashtra has 36 districts.[28] For each year we calculate the average attributable expenditure of the two selected districts (Chandrapur and Ratnagiri) as percentage of their average District Domestic Product (DDP). Multiplying the average attributable expenditure-DDP ratio thus obtained with the DDP of each of the 33 districts in the state we derive for each district the total attributable expenditure for that year. Aggregating across all the districts we obtained total attributable expenditure for 33 districts for that year (table 11).

Aggregating biodiversity attributable expenditures of the selected districts, Chadrapur and Ratnagiri with those for the remaining districts we get estimates of biodiversity attributable expenditure (from District plan schemes) for all the districts in the state.

4.4 Total Expenditure on Biodiversity Conservation in Maharashtra

Aggregating expenditures attributable towards biodiversity conservation in Maharashtra from central scheme funds (inclusive of state shares), state scheme funds, district scheme funds (aggregating over all the districts as described in the previous section), Finance Commission forest grants, CAMPA releases to Maharashtra and grants to MSSB from NBA we get the total expenditure attributable for biodiversity conservation from public sources in Maharashtra during 2009-10 to 2015-16 (table 11).

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[28] On 1 August 2014 the 36th district, Palghar was carved out of Thane district. As the District Domestic Product of Palghar was not available, in the current analysis we have considered it to be part of Thane district. This makes the total number of districts in the state to be 35.

Table 11: Attributable Expenditures towards Biodiversity in Maharashtra – Summary

(Rs. Crore)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
(Scenario-1)							
1. Central Schemes	894.66	953.43	1662.29	1659.30	1314.65	927.12	1374.13
2. State Schemes	609.76	661.60	1075.15	1074.68	1063.60	1514.91	1590.45
3. Chandrapur District	1.89	3.79	3.99	6.28	6.78	11.31	19.16
4. Ratnagiri District	2.71	2.47	3.50	2.96	4.68	5.72	6.00
5. 33 Districts @	146.17	202.74	238.43	300.38	381.55	424.37	481.21
6. FC Forest Grants	14.00	38.70	38.70	77.40	77.40	77.40	--
7. NBA Grants	0.00	0.00	0.01	0.00	0.02	1.15	0.12
8. CAMPA releases	89.35	85.49	82.63	78.21	78.00	148.00	172.00
Total Attributable Expenditure (1 to 8)	1758.53	1948.21	3104.70	3199.21	2926.70	3109.99	3643.08
GSDP	855751	1049150	1280369	1459628	1649695	1780721	1986721
Total Expenditure	112345	124423	141434	156134	174923	197077	213167
Attributable expenditure (% of GSDP)	**0.21**	**0.19**	**0.24**	**0.22**	**0.18**	**0.17**	**0.18**
Attributable expenditure (% of total expenditure)	**1.57**	**1.57**	**2.20**	**2.05**	**1.67**	**1.58**	**1.71**
(Scenario-2)							
1. Central Schemes	1514.91	1684.38	2766.27	2521.93	2082.21	1501.45	2009.91
2. State Schemes	744.88	824.10	1343.16	1350.39	1305.71	2070.10	1964.16
3. Chandrapur District	2.45	4.55	4.72	7.72	7.87	12.49	21.43
4. Ratnagiri District	3.81	3.37	4.57	4.07	6.24	8.03	8.38
5. 33 Districts @	199.40	256.44	295.89	383.27	469.55	521.05	587.76
6. FC Forest Grants	14.00	38.70	38.70	77.40	77.40	77.40	--
7. NBA Grants	0.00	0.00	0.01	0.00	0.02	1.15	0.12
8. CAMPA releases	89.35	85.49	82.63	78.21	78.00	148.00	172.00
Total Attributable Expenditure (1 to 8)	2568.81	2897.02	4535.96	4422.99	4027.01	4339.66	4763.75
Attributable expenditure (% of GSDP)	**0.30**	**0.28**	**0.35**	**0.30**	**0.24**	**0.24**	**0.24**
Attributable expenditure (% of total expenditure)	**2.29**	**2.33**	**3.21**	**2.83**	**2.30**	**2.20**	**2.23**

Note: NBA: National Biodiversity Authority; @ Maharashtra has 35 districts. For each year we calculate the average attributable expenditure of the two selected districts (Chandrapur and Ratnagiri) as percentage of their average District Domestic product (DDP). Multiplying the average attributable expenditure-DDP ratio thus obtained with the DDP of each of the 33 districts we derive for each district the total attributable expenditure for that year.
Source: Authors' calculations; Total Expenditure from Budget Documents, GSDP and DDP data from Economic Survey of Maharashtra (various years).

Examination of the roles of different ministries of Government of India in terms

of their contribution towards biodiversity conservation, management and related expenditures reveal that Ministry of Environment Forest and Climate Change accounts for most of the expenditures through schemes that have direct relevance for biodiversity, while Ministry of Rural Development through its schemes account for most of the expenditures that have Indirect-High and Indirect-low relevance for biodiversity. The other central ministries contributing towards biodiversity related expenditures are Ministry of Water Resources (Direct and Indirect-low relevance); Ministry of Agriculture (indirect-low relevance) and Ministry of Urban Development (Indirect-Medium relevance).

As far as line departments of Maharashtra Government are concerned, we find that Forest department accounts for most of the expenditure under schemes having direct relevance for biodiversity. The other important departments having biodiversity relevant schemes in the state are Water Conservation department (Indirect High, Medium and Low relevance); Planning Department (indirect-High) and Agriculture department (Indirect-low).

5. Mapping Expenditure for Biodiversity Conservation from funds received through External Sources

Government of India receives external assistance by way of loans and grants through bilateral and multilateral agreements for program/projects implemented directly by the Central or State Government or for non-government organizations where the government acts as a guarantor. Such projects are known as externally aided projects (EAP).

Mapping of fund flows for biodiversity conservation through external assistance would require project/program/activity-wise data. This information was collected from the Aid Accounts and Audit Division of Department of Economic Affairs, Ministry of Finance, Government of India. Projects/activities which had biodiversity relevant components were identified and data in respect of utilization of funds under each of the identified projects/activities during a financial year were compiled for the period 2009-10 to 2015-16.

Applying attribution coefficients we derive biodiversity attributable expenditure under externally aided projects in operation in India. These range between 3.64 to 5.66 percent of the total fund flows under EAP (table 12).

Table 12: Biodiversity Attributable External Fund Flow in India

(Rs. crore)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Total EAP	25318.7	38002.9	28996.7	25619.6	29034.3	35133.8	37517.4
Biodiversity Attributable EAP	1228.7	1382.7	1658.6	1392.5	1642.3	1650.8	1756.0
Biodiversity Attributable EAP as % of Total EAP	4.85	3.64	5.72	5.44	5.66	4.70	4.68

Source: Author's calculations

Projects having direct relevance to biodiversity account for most of the total attributable expenditure accounting for about 60 percent of the total biodiversity attributable expenditure under externally funded projects followed by those having indirect high and medium relevance.

6. Mapping Expenditure for Biodiversity Conservation for funds received under Corporate Social Responsibility (CSR)

Corporate sector's contribution through CSR mandate can be an important source of funds for financing biodiversity conservation in the country. The Companies Act 2013, along with Companies (Corporate Social Responsibility Policy) Rules, 2014 mandate companies meeting certain threshold[29] to spend at least 2 percent of their average net profit (profit before tax) for the immediately preceding three financial years on CSR activities. Environmental sustainability, biodiversity conservation are among the various activities on which these funds can be spend as per Schedule VII of the Act.

In this paper we map the CSR spending of Central Public Sector Enterprises (CPSEs), incorporated under the Companies Act, on conservation of biodiversity. This involves identifying biodiversity relevant projects/activities by these companies under CSR and estimating the expenditure which can be attributed to biodiversity conservation/protection.

As activity-wise data of CSR spending by these companies is not available in public domain, we did a survey of sample CPSEs to get this information. Out of the 298 CPSEs as on 31.03.2015[30], 97 CPSEs have Maharatna, Navratna and Miniratna status. Out of these 97 CPSEs, 60 companies were selected for the survey based on

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[29] Companies with market cap of more than Rs. 5 billion or a turnover of Rs. 10 billion or net profit of Rs. 50 million or more are mandated to spend at least 2 percent of their average net profit for the immediately preceding three financial years on CSR activities.

[30] This excludes 7 Insurance Companies, Banks and newly set up CPSEs.

investment size, sector of operation, impact/dependence on biodiversity, and awareness and focus on environmental and ecological sustainability. The survey involved collecting relevant information through a detailed questionnaire and also through in-person interaction with senior officials of the sampled CPSEs. In addition to the survey, sustainability reports, annual reports, business responsibility reports, and CSR reports of these companies were examined.

20 out of the 60 sampled CPSEs furnished complete information. The sampled CPSEs on an average spent Rs. 460.56 crore per year during 2009-10 and 2015-16 on CSR activities of which Rs.13.66 crores (or 2.97 percent) was attributable to biodiversity conservation. Applying the attribution coefficient of 2.97 percent to the annual CSR expenditure of 97 CPSEs we derive for each year the biodiversity relevant CSR expenditure (table 13).

Table 13: Biodiversity Attributable CSR Expenditure in India

(Rs. crore)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
CSR Expenditure (97 CPSEs)	2209.80	2328.78	2451.62	2639.93	3017.69	3228.80	3431.23
Biodiversity Attributable Expenditure	65.63	69.16	72.81	78.41	89.63	95.90	101.91
Based on CMIE data for 38000 companies						487.43	570.35

Source: Author's calculations

7. Estimating of All-State Biodiversity Attributable Expenditure in India

Maharashtra is a large state and a truly representative one. It is among the top 5 states in India in terms of overall species diversity and natural resources. We use the year-wise biodiversity attribution coefficients from public sources (a) as percentage of GSDP of Maharashtra and (b) as percentage of total expenditure of Maharashtra (presented in table 10) to estimate biodiversity relevant/attributable expenditure from public sources aggregated across all states. We get two sets of estimates (i) based on percent of GSDP and (ii) based on percent total expenditure. Adding to these the estimates of biodiversity relevant expenditures for funds received through EAP and CSR, both of which are for the entire country, we get estimates of biodiversity attributable expenditure aggregated across all states in the country (see table 14).

Table 14: Estimates of biodiversity Attributable Expenditure: All States

(Rs. Crore)

Year	Estimates of biodiversity Attributable Expenditure Based on			
	GSDP		Total Expenditure	
	Scenario-1	**Scenario-2**	**Scenario-1**	**Scenario-2**
2009-10	12666.30	17906.17	16078.72	22890.93
2010-11	13769.56	19768.55	18375.89	26618.26
2011-12	21731.86	30952.00	29080.86	41688.86
2012-13	22052.45	29925.41	30667.01	41835.25
2013-14	20616.44	27716.22	28509.59	38576.87
2014-15	22160.74	30232.37	31874.74	43787.24
2015-16	25662.68	32985.44	38971.95	50388.86

Source: Author's calculations

8.   Conclusion and Way Forward

Analysis in this paper finds that biodiversity finance in India is highly fragmented, lacks a clear policy and a road map. Multiple institutions are involved in directing finance often with overlapping functions and no systematic tracking. The paper has attempted the following:

a) It presents a methodology for a detailed mapping and estimation of budgetary fund flows for biodiversity conservation in the state of Maharashtra. This includes fund flows through schemes/programs from the central government, from consolidated fund of the state government, and from district Plans, grants from Finance Commission and National Biodiversity Authority, and releases from CAMPA;

b) Estimates for Maharashtra have been used to estimate all-state budgetary expenditure on biodiversity, and

c) Estimates expenditure on biodiversity in India through CSR and EAP.

From (b) and (c) a comprehensive all-India estimate of expenditure on biodiversity has been obtained thus covering over 90 percent of public funds for biodiversity.

The study finds that government budgets are the principal source of funds for biodiversity conservation in India. Results show that there is no clear trend in biodiversity expenditure (ranging between Rs. 21731.86 crore in 2011-12 to 50388.86 crore in 2015-16) during the period of study which could partly be explained by the fact that biodiversity conservation in India is driven by programs and schemes of multiple institutions rather than a clear and measurable set of targets, strong synergies among institutions and systematic tracking of biodiversity outcomes.

States on an average are spending 1.93 to 3.19 per cent of their total expenditure; and 0.23 to 0.39 per cent of their state domestic product on biodiversity conservation. In the absence of a target based finance plan for biodiversity conservation in India it is not possible assess the current gap in expenditure on biodiversity, however, given the mega diverse biodiversity status and a wide range of threats including pressure from a large population current expenditure appears on the lower side.

Besides the Ministry of Environment Forest and Climate Change, the other key central ministries contributing towards biodiversity conservation are Ministry of Water Resources, Ministry of Rural development, and Ministry of Agriculture. At the state government level key departments constitute Forest Department, Planning Department, Water Resources Department and Department of Agriculture.

While central government schemes are focused towards Sectoral Mainstreaming and Sustainable use of Natural Resources, state and district schemes are focussed on sustainable use of natural resources, enhancing implementation, restoration and protection aspects of biodiversity conservation.

During the study period, biodiversity expenditure through EAP (loans and grants) range from 3.64-5.72 percent of the total EAP funds. With CBD's increasing focus on mainstreaming biodiversity in social sector as well as development projects there is huge potential of increasing biodiversity expenditure through EAP. The paper finds that not much is being spent for biodiversity by the corporate sector through its CSR mandate, although there is potential for increasing expenditure for biodiversity conservation by the corporate sector.

Schemes categorized under 'direct' and 'indirect-high' categories of biodiversity relevance have a relatively greater impact on biodiversity conservation. Ensuring higher budgetary allocations for such schemes and maintaining their continuity over the years would contribute towards biodiversity conservation. This would require identifying biodiversity relevant activities and tagging expenditures thereof under each of the schemes in the budgets so that biodiversity relevant expenditures can be tracked easily on a regular basis. Ideally schemes and programmes should be designed in such a way that expenditures under its various activities can be easily identified and one can tag biodiversity relevant expenditures. This would facilitate tracking of such expenditures over the years across different departments and ministries. We had envisaged this in our scenario-3, but the proposed scenario could not be adopted due to non-availability of activity-wise expenditure data for most of the schemes. The schemes should be designed in such a way so that various activities and expenditures can be tagged, tracked and monitored with ease.

Simple and practical steps towards better coordination between relevant departments have the potential to improve biodiversity focus, thereby improving outcomes of government expenditure in general and biodiversity outcomes in particular. A beginning has been made in this direction by the central government in the context of implementation of the Sustainable Development Goals (SDGs). This could be taken as a model to emulate.

The concept of mainstreaming was included in article 6(b) of the CBD, which called on the Parties to the Convention to "integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies"[31]. One of the entry points for mainstreaming of biodiversity is the use of National Biodiversity Strategies and Action Plans (NBSAPs) as a policy instrument to embed biodiversity priorities into national development and poverty reduction strategies; and vice versa, to integrate development priorities in national biodiversity strategies.

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[31] https://www.cbd.int/convention/articles/?a=cbd-06

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