

Progress Report

**Preparation of Detailed Project Report (DPR) for
rejuvenation of *Subarnarekha* and *Damodar* rivers through
forestry interventions**

Funded By
NAEB, MOEF&CC, Govt. of India



**Indian Council of Forestry Research and Education
P.O. New Forest, Dehradun, Uttarakhand, India**

Progress Report till March 2023

SECTION –A (GENERAL)

1	Project Title	Preparation of Detailed Project Report (DPR) for rejuvenation of Subarnarekha and Damodar rivers through forestry interventions
2	Institute Name	ICFRE-Institute of Forest Productivity, Ranchi
3	Project Duration	18 Months
4	Date of Start	August, 2022
5	Planned Date of Completion	March, 2024
6	Approved Budget (Rs.)	1.17 Cr
7	Name & Designation of Nodal Officer	Dr. Sharad Tiwari, Scientist-G
8	Funded By	NAEB, MOEF&CC, Govt. of India
	Addl. Research Manpower (Nos. & date from which engaged): (RO/ RA/ SRF/ JRF/ PA/ FA/JPF/SPF/SMS)	SMS-1 Nos. JPF- 5 Nos.

SECTION –B (PHYSICAL TARGETS AND ACHIEVEMENTS)

Target: Review of existing data/information knowledge

Target Quarter: I and II

The literature review concerning Subarnrekha and Damodar has been conducted. Based on the literature survey, chapters on Damodar and Subarnrekha Basin are being prepared.

Target: Identification of knowledge gaps, scoping of forestry activities and developing strategy

Target Quarter: I and II

On the basis of consultation with stakeholders, it was decided to consider a 5Km riverscape buffer for the entire study area including rivers Damodar, Subarnrekha and their major tributaries. Consequently, following major tributaries are included:

Tributaries for Damodar River	Tributaries for Subarnrekha River
Garhi	Raru
Haharo	Kanchi
Bokaro	karkari
Konar	Kharkai
Jamuniya	Dulung
Kudiya	Sankh
Barakar	Jumar
Bhera	Garra
Darkeswar	
Sila/Shilabati	

The interaction meet and existing literature revealed sporadic initiatives towards river rejuvenation. For the rejuvenation of these rivers, a holistic approach is necessary. Although, River Rejuvenation Committee exist in Jharkhand and West Bengal, but they more primarily focused to river pollution.

Target: Identification of stakeholders/ academia/ experts/ organizations/ agencies for developing implementation plan on forestry interventions
Target Quarter: Quarter I and II

Due to the presence of a variety of landclasses, including natural, agricultural, urban, and rural, in the riverscape buffer, all relevant departments such as Forest, Agriculture, Horticulture, Mining & Industries, Land resources, Urban and Rural development are potential stakeholders for the current endeavor.

Letters to concerning states i.e. Jharkhand, West Bengal and Odisha were sent regarding appointment of State Nodal Officers from different stakeholders (including forest, agriculture, land revenue, soil conservation, irrigation, water resource and mines).

Taregt: Conduction of kick off meeting/Workshop & brain storming session with state representatives
Target Quarter: Quarter I, II, and III

Jharkhand:

A number of meetings with stakeholder departments have been done. Some of the major events are enlisted below:

- A meeting with APCCF CAMPA, Shri Sanjeev Kumar, IFS, CAMPA and was held on the 23rd of August, 2022.
- Meeting with Shri N K Singh, IFS, APCCF, Development was held on September 7th 2022.
- Meeting with State Nodal officer, S R Natesha, CCF, Wild Life, Jharkhand, was held on September, 28, 2022.
- A workshop involving senior forest officers including APCCF, CCF, CF and DFOs of all the concerned forest divisions was held on 12th October at IFP, Ranchi. The workshop aimed at apprising the forest officials with the prospective activities under the PDR. The workshop was held through Hybrid Mode.
- A state level inception workshop involving stakeholders from forest, agriculture, revenue, pollution control, rural development, water resources, irrigation and urban under the purview of riverscape was held on 13th December at Palash Sabhagar, Ranchi, Jharkhand. The workshop provided a platform to interact with different stakeholders and collect their feedback on the proposed plan of activities under the DPR.
- Meeting State Nodal Officer, WB, at Webel IT Park, Durgapur on 25-03.2023, regarding status of training to frontline staff of SFD, WB, and field data from

concerning forest divisions. Accordingly, he issued a letter to all the concerned DFOs, to speed up the data collection process and submit it to IFP, Ranchi



Fig. 1 Deliberations during the state-level-workshop for the forest officers of Jharkhand, held at IFP, Ranchi on 12th October, 2022.



Fig.2 State-level-Inception workshop held at Palash Sabhagar, Ranchi on 13th December, 2022

West Bengal:

- A meeting with PCCF & HoFF, West Bengal was held on 2nd September 2022.
- Shri Kalyan Das, CCF, CE Circle was appointed as the State Nodal Officer for West Bengal.
- A meeting with the State Nodal Officer, West Bengal was held on 13th September at Durgapur to appraise him with the project concept and activities.
- During the meeting future course of actions, data required and stake-holder participation was discussed.
- A workshop involving CCF, CF and DFOs of the concerning forest divisions under the riverscape of Damodar, Subarnrekha and its major tributaries was conducted on 28th Nov, 2022 at IT Webel Park, Durgapur, West Bengal. During the workshop, a presentation on defined riverscape and prospective activities was given. The expected support from the State Forest Department was also deliberated. The concerns and feedback provided from the participants were appropriately addressed.



Fig.3 Presentation during the state level workshop for the forest officers held at Webel IT Park, Durgapur on 29th November, 2022. The forest officers including CCF, CF and DFOs of the concerned forest divisions participated in the meeting.

Interaction with allied departments.

- Meeting with the State Nodal Officer, Agriculture Department, West Bengal was held on 20th Feb, 2023. Dr Sharad Tiwari, Nodal Officer, IFP, Ranchi apprised him about the DPR activities and expected support from Agriculture department.
- On February 21, 2023, a meeting with Dr Rajesh Kumar, IPS, Member Secretary of the Pollution Control Board of West Bengal was held. Dr. Sharad Tiwari, Nodal Officer, IFP, Ranchi, briefed him on DPR activities and solicited the participation of major metropolitan departments, including Asansol and Durgapur. The scientists from the Pollution Control Board of West Bengal interacted and discussed the state's efforts to rejuvenate the Damodar River.

Odisha:

- A meeting with PCCF & HoFF, Odisha, was held on 26th August 2022.
- A State Nodal Officer from the State Forest Department has been appointed.

- A state level meeting was held on 22th Feb, 2023 at Sankalp Community Hall, Baripada, Odisha. The workshop included participants from forest, revenue, agriculture, and land resources. The workshop was attended by ADM, RCCF, and DFOs. During the workshop, the defined riverscape and prospective plan was presented and discussed.



Fig. 4 Presentation on Subarnarekha river during State-Level inception workshop for Odisha, held at Sankalp Community Hall, Baripada on 22nd February, 2023

Target: Identification, selection & prioritization of forestry intervention sites and type of treatment plans (natural, agriculture and urban landscapes), Preparation of riverscape buffer zone

Target Quarter: Quarter II, III, and IV (GIS layers attached as Annexure II)

- Based on stakeholder discussion it was decided to consider a uniform 5 km riverscape buffer for Damodar and Subarnrekha and their major tributaries. Accordingly, the riverscape has been prepared.
- Collection of primary data (Slope, Aspect, Elevation, Temperature, Precipitation, Administrative Boundary, Village Data, Drainage) has been completed.
- Most of the GIS layers such as Forest type/Forest cover map, Micro watershed map, DEM data have been acquired and delineated for the riverscape area.
- The micro-watershed data for the riverscape area has been prepared.
- The catchment area map of the entire study area has been prepared.
- Origin Point of Main River and major tributaries were extracted using geospatial technique. These points were physically verified.
- Land Use Land Cover (LULC) of the riverscape area has been prepared.
- Topographical data such as slope, elevation, aspect etc has been prepared.
- The Jharkhand and West Bengal Forest departments have provided the GIS map of the forest divisions within the riverscape. These boundaries will be used for analysis at the division level.
- The Spring Map, Agriculture Practices Map for the Jharkhand has been acquired from JSAC, Ranchi.
- Designing data collection forms in bilingual for all the three states has been completed (Attached Photos in Annexure-1).

Target: Interaction with front end staff of SFD for explaining Data collection mechanism and data collection

Target Quarter: Quarter III and IV

Jharkhand

The divisional training of the frontline forest staff has begun. A team from IFP, Ranchi explained the concept and method of data collection for the project. They were provided access to a pre-designed data form. In addition, they were taught how to use KML files of riverscape buffer with Google Earth using mobile device to collect location data. The following table provides training dates by division

SI No	Name of Division	Date of Training
1	Khunti	21-11-2022
2	Ranchi	25-11-2022
3	Jamshedpur	29-11-2022
4	Latehar	02-12-2022
5	Dhanbad	09-01-2023
6	Hazaribagh East, West, NP, WL	11-01-2023
7	Lohardagga	12-01-2023
8	Chaibasa&Saraikela	19-01-2023
9	Ramgarh & Bokaro	24-02-2023
10	Koderma	21-03-2023
11	Jamtara	24-03.2023



Fig. 5 Photographs of Front-line staff training programs held at different forest divisions of Jharkhand.

West Bengal

- Training of frontline forest staff for data collection has begun on a division-by-division basis. A team from IFP, Ranchi, visited the divisions and explained the project's concept and method of data collection. Participants were provided access to a pre-designed data form. In addition, they were instructed on how to use KML files of riverscape buffers with Google Earth and mobile phones to collect location data. The following table provides training dates by division.

Sl No	Name of Division	Date of Training
1	Durgapur	19-12-2022
2	Bankura North & South	20-12-2022
3	Panchet	21-12-2022
4	Purulia, Kangsabati North & South	29-12-2022
5	Jhargram	04-01-2023
6	Medinipur & Rupnarayan	05-01-2023
7	Purba Medinipur	06-01-2023
8	Burdwan	15-02-2023
9	Kharagpur	17-02-2023



Fig. 6 Photographs of Front-line staff held training programs held at different forest divisions of West Bengal

Target: Field visits and survey of prioritized sites, data collection, and analysis for prioritizing actions
Target Quarter: Quarter IV, and V

- Field surveys have been conducted to physically verify the source of Damodar, Subarnrekha, and their major tributaries, including Barakar, Kanchi, Kharkai, Karkari, Dulung, Jamunia, Darkeswar, and Shilabati, and field data has been collected.
- To evaluate the field conditions of Damodar, Subarnrekha, and their tributaries in Jharkhand and West Bengal, an extensive field survey was conducted. The survey included Panchet, Maithon dam, the Jharia coal field area, Dhanbad, the Industrial area in Muri, Dhanbad, Bokaro, Asansol, and Durgpaur. In addition, field surveys to Bankura, Burdwan, Medinipur, and Jhargram has also been carried out. Photographs, field data and interaction with local people have been done to collect the local knowledge base.
- The field survey to various parts have shown that in the majority of agricultural landscapes, paddy is grown as a single crop. There was no evidence of Agroforestry practices in the visited areas of Jharkhand and West Bengal.
- *L. camara* and *C. odorata* were noted as the predominant invasive species distributed in the region.

- Parts of Phusro, Jharia, Dhanbad, Jamshedpur, Asansol, and Durgapur were the most polluted spots along the riverscape. This was quite obvious given that these are the region's industrial hubs.
- From March 19 to March 25, 2023, an interaction survey with farmers was conducted in parts of Jharkhand. The survey team educated the farmers on the "River Rejuvenation Scheme", its significance, and the advantages of adopting Agro-forestry practices. During the survey,



Fig.7 Origin point of River Damodar at Chulha Pani, Lohardaga, Jharkhand. Location Coordinates: 23°37'10.73" N, 84°40'07.37"E. The river originates from underground spring locally called as 'Chuan'.



Fig. 8 Origin point of River Subarnarekha at Rani Chua, Nagri, Ranchi, Jharkhand. Location Coordinates: 23°18'6.58"N, 85°11'3.11"E. The river originates from underground spring



Fig. 9 Origin point of River Barakar at Fuldaha, Hazaribagh, Jharkhand. Location Coordinates: 24° 7'3.63"N, 85°21'25.03"E.



Fig. 10 Origin point of River Konar at Sultana, Hazaribagh, Jharkhand. Location Coordinates: 23°58'47.96"N, 85°16'5.65"E.



Fig. 11 Hindalco industry along Subarnarekha River near Muri, Jharkhand

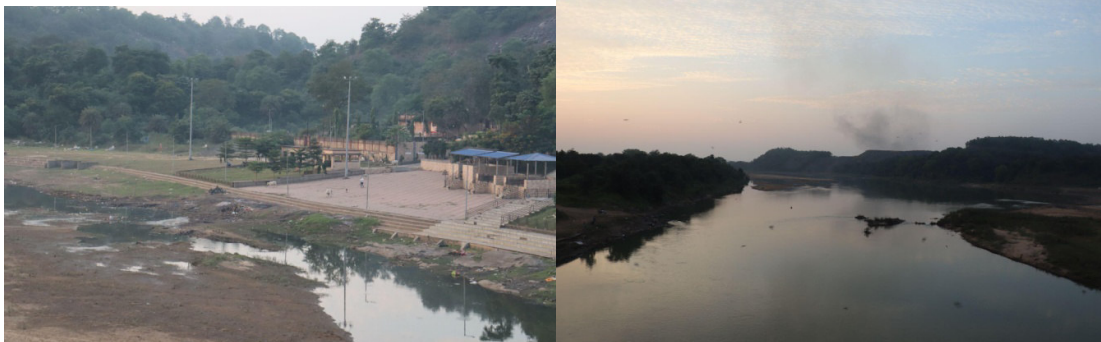


Fig. 12 Damodar River near Jharia Mines, Sindri, Dhanbad, Jharkhand



Fig. 13 Durgapur Barrage on Damodar River near Durgapur City, West Bengal



Fig. 14 Maithan Dam on Barakar River at Maithan, Jharkhand



Fig. 15 Panchet Dam on Damodar River at Panchet, Jharkhand



Fig. 16 Barakar River site at Barakar, West Bengal



Fig. 17 Khudia River site at Luhchibad, Jharkhand



Fig. 17 Darkeswar River site at Bankura, West Bengal



Fig. 17 Mining area near Koiridih, Jharkhand. The entire stretch especially of river Damodar is dominated by the mining blocks.



Fig.18 Check dam on Kool River, towards Muri Road. Mango plantation along river bank taken up by the farmers. Mango crop has been adapted by the farmers in different parts of Jharkhand, and Amrapali and Mallika variety is being practiced widely in this part.

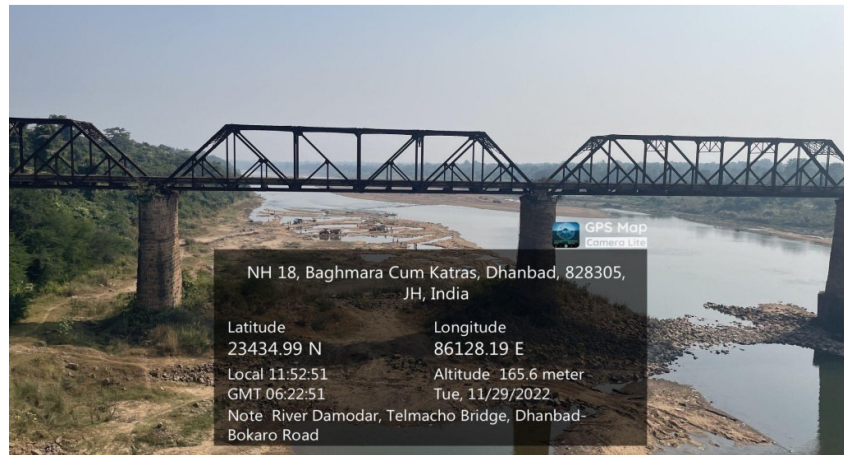


Fig. 19 River Damodar along Dhanbad- Bokaro Road



Fig. 20 River Damodar along Sindri-Govindpur road. The photograph depicts a mining patch along the riverbed.



Fig.21 Interaction with locals at Barai village, Hazaribagh(E)



Fig.22 Illustrating villages about the benefits of plantation along riverside at Chapardiha, Giridih



Fig.23 Photograph taken while listing down the suggestions given by the locals at Banha Nawada village, Hazaribagh(W)

SECTION –C (SUMMARY OF OUTPUTS - Cumulative till date)

SI No	Activity	Quarter					
		I	II	III	IV	V	VI
1	Review of existing data/information knowledge w.r.t selected rivers	~	~				
2	Identification of knowledge gaps, scoping of forestry activities and developing strategy	~	~				
3	Identification of stakeholders/ academia/ experts/ organizations/ agencies for developing implementation plan on forestry interventions	~	~				
4	Conduction of kick off meeting & brainstorming session with state representatives	~	~	~	~		
5	Conduction of state level workshop to develop region specific strategies including finalisation of riverscape area		~				
6	Identification, selection & prioritization of forestry intervention sites and type of treatment plans (natural, agriculture and urban landscapes), Preparation of riverscape buffer zone		~	~	~		
7	Interaction with front end staff of SFD for explaining Data collection mechanism and data collection		~	~	~		
8	Field visits and survey of prioritized sites, data collection and analysis for prioritizing actions				~	~	
9	Preparation of Intervention models/Draft DPR				~	~	
10	Conduction of final state level consultation workshop to discuss draft DPR for finalization					~	~
11	Submission of Final DPR					~	~

SECTION –D (FINANCIAL ACHIEVEMENT)

Released : 40.0 Lacs

Utilised : 39,40,371

Balance : 59,629.00

Committed: 42.05371 Lacs

Budget Head	Expenses (Rs.)
Salary	1137539
Consumables	155054
Travel	1051579
Contingency	1861199
Total	42,05,371
Actually Utilised	39,40,371

***Payment for Rs 2,65,000 under Salary head could not be done due to the shortage of budget.**

Annexure-1

Data Collection Format in English/Hindi

DPR PREPARATION OF FORESTRY INTERVENTIONS FOR DAMODAR & SUBARNAREKHA
PROFORMA OF DATA COLLECTION FOR PROPOSED SITE
 (INSTITUTE OF FOREST PRODUCTIVITY, RANCHI- 835303)

A. RIVERSCAPE	DAMODAR (दामोदर)	SUBARNAREKHA (सुबर्नरेखा)		
B. LANDSCAPE (Check the Box) परिदृश्य (बॉक्स को चेक करें)	FOREST वन	AGRICULTURE कृषि		
C. INTERVENTIONS (Check the Box) हस्तक्षेप (बॉक्स को चेक करें)	Plantation Activity वृक्षारोपण गतिविधि	Wetland Management (Natural & Artificial) आईभूमि प्रबंधन		
	Bioremediation & Bio filtration जैविक उपचार तथा बायोफिल्ट्रेशन	Riparian Wildlife Management नदी तट वन्यजीव प्रबंधन		
	River Front Development & Ecotourism नदी किनारा विकास तथा पर्यटन पर्यटन	Soil and Water Conservation मृदा और जल संरक्षण		
	Eco Park Development पर्यावरण पार्क विकास	Institutional Industrial Plantation संस्थान/औद्योगिक विकास		
	Any Other (Please Specify.....) कोई अन्य (कृपया निर्दिष्ट करें.....)			
D. TREATMENT SITE (DETAILS) (उपचार स्थल)				
1 Name Of Site (स्थान का नाम)				
2 Area (In Hectare) (क्षेत्रफल (हेक्टेयर में))				
E. GEOGRAPHICAL DETAILS (भौगोलिक विवरण)				
1 State (राज्य)				
2 District (ज़िला)				
3 Forest Divisions (वन प्रमंडल)				
4 Forest Range (वन परिश्रेष्ठ)				
5 Forest Block (वन ब्लॉक)				
6 Forest Beat (वन बीट)				
7 Block Name (विकास खंड का नाम)				
8 Tehsil (तहसील)				
9 Panchayat (पंचायत)				
F. BASELINE DATA (आधारभूत तथ्य)				
1 Current Status Of Flora And Fauna समसमय और जीवों की वर्तमान स्थिति (Existing Biodiversity) मौजूदा जैव विविधता	Trees (पेड़)	Herbs (बड़ी बूटी)	Shrubs (छाड़ियाँ)	Fauna (जीव)

1

2 Legal Status of Land (भूमि की कानूनी स्थिति) (Check the Box (बॉक्स को चेक करें))	Forest Land वन भूमि	Private Land निजी भूमि	Lease land पट्टा भूमि			
	Revenue Land राजस्व भूमि	Community Land सामुदायिक भूमि	Any Other कोई अन्य			
3 Geology and Soil Type* (भूविज्ञान और मिट्टी का प्रकार)						
4 Terrain (check the box) (इलाके (बॉक्स को चेक करें))	Hill (पहाड़ी)		Plain (समतल)			
5 Average Annual Rainfall (in mm)* औसत वार्षिक वर्षा (मिलीमीटर में)						
6 Special Features of Land* (भूमि की विशेष विशेषताएँ)						
7 Distance from nearest Road (Approx. in m) निकटतम सड़क से दूरी (लगभग मीटर में)						
8 Distance from main river/tributary with name (Approximate in m) नग्न सहाय नदी/सहायक नदी से दूरी (लगभग मीटर में)						
9 Suggested species for plantation based on past experience/native/ preferred पिछले अनुभव/मूल/वरीयता के आधार पर वृक्षारोपण के लिए सुझाई गई प्रजातियाँ	Trees (पेड़)	Herbs (बड़ी बूटी)	Shrubs (छाड़ियाँ)			
10 Details of Fencing Work, if required before plantation वृक्षारोपण से पूर्व बाड़ लगाने के कार्य का विवरण यदि आवश्यक हो						
11 Details of SMC works, if required before plantation SMC कार्यों का विवरण, यदि आवश्यक हो तो वृक्षारोपण से पहले						
12 Area of plantation (in Hectare) वृक्षारोपण का क्षेत्रफल (हेक्टेयर में)	Year 01	Year 02	Year 03	Year 04	Year 05	
13 Planting Cost Including Nursery (Approx. in Lakhs) रोपण लागत नर्सरी सहित (लगभग लाख में)	Year 01	Year 02	Year 03	Year 04	Year 05	
14 Maintenance Cost of plantation with years (Approx. in Lakhs) वृक्षारोपण की रखरखाव लागत वर्षी सहित (लगभग लाख में)	Year 01	Year 02	Year 03	Year 04	Year 05	
15 Remarks if Any (यदि कोई टिप्पणी हो)						
16 GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required) सभी कोनों पर साइट के जीपीएस निर्देशांक (साइट के आकार के अनुसार न्यूनतम 4 अंक आवश्यक हैं)	Point1	Point2	Point3	Point4	Point5	Point6
	Latitude अक्षांश					
	Longitude देशान्तर					
17. ROUGH SKETCH OF THE TREATMENT SITE/ MAP (AS AN ATTACHMENT) उपचार स्थल/मानचित्र का कच्चा चित्र (अनुसंधान के रूप में)						
18. PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.ifp@gmail.com dpr2.ifp@gmail.com में आईटी में कुछ वर्तमान फोटोग्राफ केने						

2

*Not Mandatory (अनिवार्य नहीं)

Data Collection Format in Bengali (বাংলা)

DPR PREPARATION OF FORESTRY INTERVENTIONS FOR DAMODAR & SUBARNAREKHA
PROFORMA OF DATA COLLECTION FOR PROPOSED SITE
 (INSTITUTE OF FOREST PRODUCTIVITY, RANCHI - 83500)

A. RIVERSCAPE	DAMODAR (দামোদর)		SUBARNAREKHA (সুবর্ণরেখা)	
B. LANDSCAPE (Check the Box) কৃ. দূশ (বাক্সটি যাচাই করুন)	FOREST বন	AGRICULTURE কৃষি	URBAN শহর	OTHER অন্যান্য
C. INTERVENTIONS (Check the Box) হস্তক্ষেপ (বাক্সটি যাচাই করুন)	Plantation Activity বৃক্ষরোপণ কর্মসূচী		Wetland Management (Natural & Artificial) জলাশয় ব্যবস্থাপনা	
	Bioremediation & Biofiltration বায়োরিমিডিয়েশন ও বায়োফিল্ট্রেশন		Riparian Wildlife Management নদীতীরস্থ বন্যপ্রাণী ব্যবস্থাপনা	
	River Front Development & Ecotourism নদী সন্মুখ উন্নয়ন এবং ইকোটুরিজম		Soil and Water Conservation মাটি ও জল সংরক্ষণ	
	Eco Park Development ইকো পার্ক উন্নয়ন		Institutional Industrial Plantation প্রতিষ্ঠানিক/শিল্প বৃক্ষরোপণ	
	Any Other (Please Specify.....) অন্য আরও কিছু (নির্ধারন করুন.....)			
D. TREATMENT SITE (DETAILS) (হস্তক্ষেপ স্থান (বিশদ বিবরণ))				
1 Name Of Site (স্থানের নাম)				
2 Area (In Hectare) (একর (হেক্টরে))				
E. GEOGRAPHICAL DETAILS (ভৌগোলিক বিবরণ)				
1 State (রাজ্য)				
2 District (জেলা)				
3 Forest Divisions (বন বিভাগ)				
4 Forest Range (বন রেঞ্জ)				
5 Forest Block (বন ব্লক)				
6 Forest Beat (বন ষাট)				
7 Block Name (ব্লকের নাম)				
8 Tehsil (তেহসিল)				
9 Panchayat (পঞ্চায়েত)				
F. BASELINE DATA (কর্মসূচীর তথ্য)				
1 Current Status Of Flora And Fauna (উদ্ভিদ ও প্রাণীর বর্তমান অবস্থা) (Existing Biodiversity) (বিদ্যমান জীববৈচিত্র্য)	Trees (গাছ)	Herbs (পুণ্ড)	Shrubs (বোশপকাড়)	Fauna(প্রাণী)

1

2	Legal Status of Land (ভূমির আইনগত অবস্থা) (Check the Box (বাক্সটি যাচাই করুন))	Forest Land বনভূমি	Private Land ব্যক্তিগত জমি	Lease Land ইজারা জমি	
		Revenue Land রাজস্ব জমি	Community Land সম্প্রদায়ের জমি	Any Other অন্য কিছু	
3	Geology and Soil Type* (কৃ. ভূ. এবং মাটির ধরন)				
4	Terrain (check the box) (ভূখণ্ড (বাক্সটি যাচাই করুন))	Hill (পাহাড়)	Plain (সমভূমি)		
5	Average Annual Rainfall (in mm)* বার্ষিক গড় বৃষ্টিপাত (মিলিমিটারে)				
6	Special Features of Land* (ভূমির বিশেষ বৈশিষ্ট্য)				
7	Distance from nearest Road (Approx. in m) নির্কটতম রাস্তা থেকে দূরত্ব (মিটারে)				
8	Distance from main river/tributary with name (Approximate in m) নামের সাথে প্রধান নদী/ত্রিপুরা থেকে দূরত্ব (মিটারে)				
9	Suggested species for plantation based on past experience/native/ preferred অতীত অভিজ্ঞতা/নেটিভ/ পছন্দের ভিত্তিতে গাছ লাগানোর জন্য প্রস্তাবিত প্রজাতি	Trees (গাছ)	Herbs (পুণ্ড)	Shrubs (বোশপকাড়)	
10	Details of Fencing Work, if required before plantation গাছ লাগানোর আগে প্রয়োজন হলে বেড়া দেওয়ার কাজের বিবরণ				
11	Details of SMC works, if required before plantation SMC কাজের বিশদ বিবরণ, যদি গাছ লাগানোর আগে প্রয়োজন হয়				
12	Area of plantation (in Hectare) গাছ লাগানোর এলাকা (হেক্টরে)	Year 01	Year 02	Year 03	Year 04
13	Planting Cost Including Nursery (Approx. in Lakhs) নার্সারি সহ রোপণ খরচ (আনুমানিক লাখে)	Year 01	Year 02	Year 03	Year 04
14	Maintenance Cost of plantation with years (Approx. in Lakhs) বছরের সাথে গাছ লাগানোর রক্ষাবেশপ খরচ (আনুমানিক লাখে)	Year 01	Year 02	Year 03	Year 04
15	Remarks if Any (যদি মন্তব্য থাকে)				
16	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required) সাইটের কোণে সাইটের জিপিএস স্থানাঙ্ক (সাইটের আকার অনুযায়ী, ন্যূনতম 4 পয়েন্ট প্রয়োজন)	Point1	Point2	Point3	Point4
		Point5	Point6		
17	ROUGH SKETCH OF THE TREATMENT SITE/MAP(AS AN ATTACHMENT) ট্রিটমেন্ট সাইট/আইডিএর কক্ষ চিত্র (একটি সংযুক্তি হিসাবে)				
18	PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.ifp@gmail.com অনুরোধ করে কিছু বর্তমান ফটোগ্রাফ সংযুক্ত করুন এই (dpr2.ifp@gmail.com) মেইল আইডিতে <small>*Not Mandatory (বধ্যাঙ্গমূলক নয়)</small>				

2

Data Collection Format in Odia (ଓଡ଼ିଆ)

DPR PREPARATION OF FORESTRY INTERVENTIONS FOR DAMODAR & SUBARNAREKHA
PROFORMA OF DATA COLLECTION FOR PROPOSED SITE
 (INSTITUTE OF FOREST PRODUCTIVITY, RANCHI - 834303)

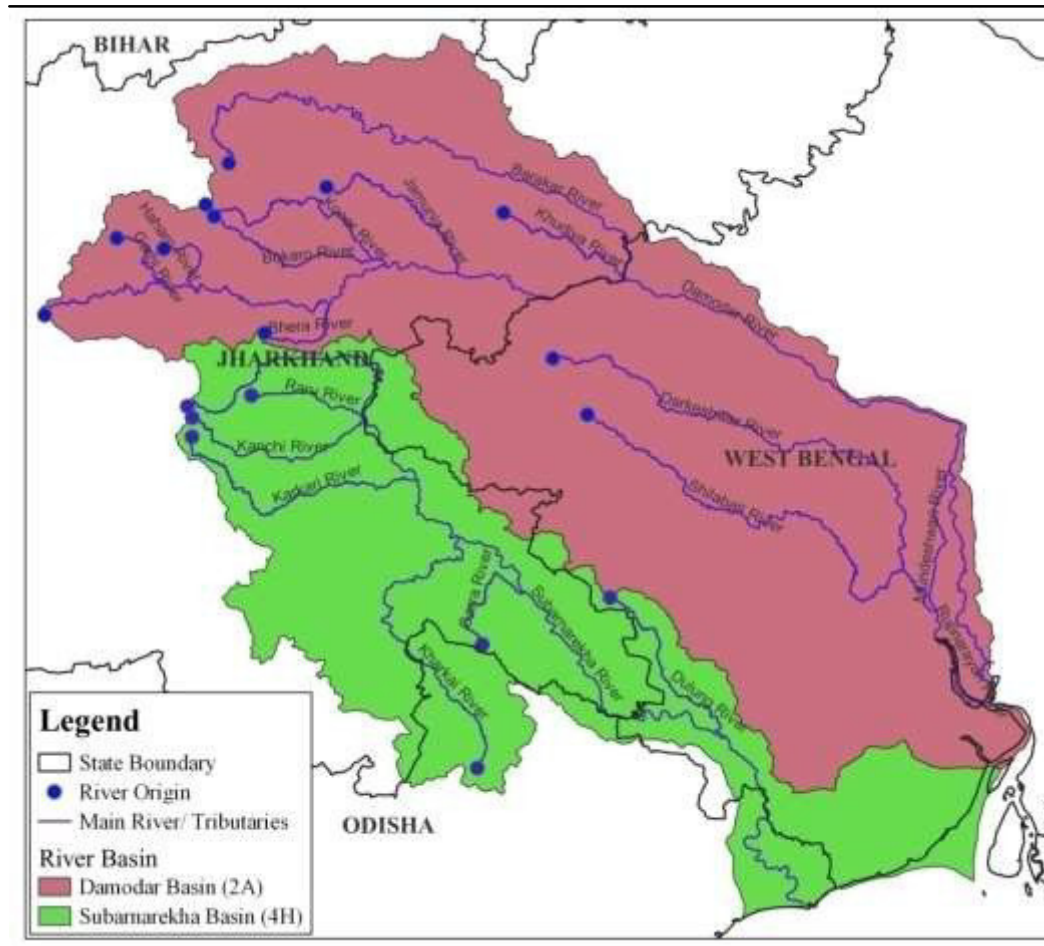
A. RIVERSCAPE	DAMODAR (ଦାମୋଦର)		SUBARNAREKHA (ସୁବର୍ଣ୍ଣରେଖା)	
B. LANDSCAPE (Check the Box)	FOREST	AGRICULTURE	URBAN	OTHER
C. INTERVENTIONS (Check the Box)	Plantation Activity ବୃକ୍ଷରୋପଣ କାର୍ଯ୍ୟକ୍ରମ		Wetland Management (Natural & Artificial) ଅର୍ଦ୍ଧଭୂମି ପରିଚାଳନା	
	Bioremediation & Bio filtration ବାୟୋରିମିଡ଼େସନ୍ ଏବଂ ବାୟୋଫିଲ୍ଟ୍ରେସନ୍		Riparian Wildlife Management ତୀରାଞ୍ଚଳୀୟ ଜୀବଜଗତ ସଂରକ୍ଷଣ	
	River Front Development & Ecotourism ତୀରାଞ୍ଚଳୀୟ ବିକାଶ ଏବଂ ଇକୋଟୁରିଜମ		Soil and Water Conservation ମୃତ୍ତିକା ଏବଂ ଜଳ ସଂରକ୍ଷଣ	
	Eco Park Development ଇକୋ ପାର୍କ ବିକାଶ		Institutional/Industrial Plantation ଅନୁଷ୍ଠାନିକ / ଶିଳ୍ପ ବୃକ୍ଷରୋପଣ	
	Any Other (Please Specify.....) ଅନ୍ୟ ଯାହା (ଦୟାକରି ସୂଚନା ଦିଅନ୍ତୁ.....)			

D. TREATMENT SITE (DETAILS) ପରିଚାଳନା ସ୍ଥାନ (ବିବୃତ ବିବରଣୀ)									
1 Name Of Site (ସ୍ଥାନ ନାମ)									
2 Area (In Hectare) (କ୍ଷେତ୍ର କେନ୍ଦ୍ରଗତ)									
E. GEOGRAPHICAL DETAILS (ଗୋଗ୍ରାଫିକ ବିବରଣୀଗୁଡ଼ିକ)									
1 State (ରାଜ୍ୟ)									
2 District (ଜିଲ୍ଲା)									
3 Forest Divisions (ଦଳର ବିଭାଗ)									
4 Forest Range (ଦଳର ପରିସର)									
5 Forest Block (ଦଳର ବ୍ଲକ୍)									
6 Forest Beat (ଦଳର ବିଟ୍)									
7 Block Name (ବ୍ଲକ୍ ନାମ)									
8 Tehsil (ତହସିଲ)									
9 Panchayat (ପଞ୍ଚାୟତ)									
F. BASELINE DATA (ବେସଲାଇନ୍ ଡାଟା)									
1 Current Status Of Flora And Fauna ଉଦ୍ଭିଦ ଏବଂ ଜୀବ ବିବରଣୀ ସୂଚି (Existing Biodiversity) ବିଦ୍ୟମାନ ଜୀବ ବିବରଣୀ	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Trees (ଦାଣ୍ଡପତ୍ର)</td> <td>Herbs (ଘାସ)</td> <td>Shrubs (ଜୁଆ)</td> <td>Fauna (ଜୀବ)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	Trees (ଦାଣ୍ଡପତ୍ର)	Herbs (ଘାସ)	Shrubs (ଜୁଆ)	Fauna (ଜୀବ)				
Trees (ଦାଣ୍ଡପତ୍ର)	Herbs (ଘାସ)	Shrubs (ଜୁଆ)	Fauna (ଜୀବ)						

2	Legal Status of Land (ଜମିର ଆବିନୀତ ଅବস্থা) (Check the Box (କ୍ଷେପଣ କରନ୍ତୁ))	Forest Land ବନଭୂମି	Private Land ବାଣିଜ୍ୟିକ ଜମି	Lease land ଇଞ୍ଚୋରା ଜମି			
		Revenue Land ରାଜସ୍ୱ ଜମି	Community Land ସମ୍ପ୍ରଦାୟର ଜମି	Any Other ଅନ୍ୟ କିଛି			
3	Geology and Soil Type* (ବୃକ୍ଷ-ତନ୍ତ୍ର ଏବଂ ଯାଣ୍ଟିର ଧରଣ)						
4	Terrain (check the box) (ଭୂସୂତ୍ର ବାଟାଣ୍ଟି ଯାହା କରନ୍ତୁ)	Hill (ମାଟାଣ୍ଟି)	Plain (ସମତଳ)				
5	Average Annual Rainfall (in mm)* ବାର୍ଷିକ ମଧ୍ୟମ ବର୍ଷା (ମିଲିମିଟର)						
6	Special Features of Land* (ଜମିର ବିଶେଷ ବୈଶିଷ୍ଟ୍ୟ)						
7	Distance from nearest Road (Approx. in m) ନିକଟତମ ରାଜ୍ଠା ଥେକା-ମୁହାଁ (ମିଟର)						
8	Distance from main river/tributary with name (Approximate in m) ମାଧ୍ୟମ ମୁଖ୍ୟ ନଦୀ/ତ୍ରୀବୁତୀରୁ ଥେକା-ମୁହାଁ (ମିଟର)						
9	Suggested species for plantation based on past experience/native/preferred ଅତୀତ ଅଭିଭାବନା/ନୈସର୍ଗିକ/ପସନ୍ଦର ଜାତିର ବୃକ୍ଷ ପାଇଁ ପାଠ୍ୟ ପ୍ରସ୍ତାବ	Trees (ମାଟା)	Herbs (ଫୁଲ)	Shrubs (ଘୋଷା)			
10	Details of Fencing Work, if required before plantation ପାଠ୍ୟ ନାମାଣ୍ଡର ଆଗେ ପ୍ରୟୋଜନ ହେବା ପାଇଁ ସେଠାରେ କରାଯିବ କାର୍ଯ୍ୟ						
11	Details of SMC works, if required before plantation SMC କାର୍ଯ୍ୟର ବିବରଣୀ, ଯଦି ପାଠ୍ୟ ନାମାଣ୍ଡର ଆଗେ ପ୍ରୟୋଜନ ହେବ						
12	Area of plantation (in Hectare) ପାଠ୍ୟ ନାମାଣ୍ଡର କ୍ଷେତ୍ର (ହେକ୍ଟାରେ)	Year 01	Year 02	Year 03	Year 04	Year 05	
13	Planting Cost Including Nursery (Approx. in Lakhs) ନାମାଣ୍ଡର ସହ ରୋପଣ ଖର୍ଚ୍ଚ (ଅନୁମାନିତ ଲାକ୍ଷ)	Year 01	Year 02	Year 03	Year 04	Year 05	
14	Maintenance Cost of plantation with years (Approx. in Lakhs) ପାଠ୍ୟ ନାମାଣ୍ଡର ସହ ବର୍ଷାକ୍ରମେ ଖର୍ଚ୍ଚ (ଅନୁମାନିତ ଲାକ୍ଷ)	Year 01	Year 02	Year 03	Year 04	Year 05	
15	Remarks if Any (ଯଦି କିଛି ଉଲ୍ଲେଖ କରିବାକୁ ହେବ)						
16	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required) ସମସ୍ତ କୋଣ ସାହିତ୍ୟର ଉପିପିଏସ୍ ସ୍ଥାନାଙ୍କ (ସାହିତ୍ୟର ଆକାର ଅନୁଯାୟୀ, ନ୍ୟୁନତମ 4 ପଏଣ୍ଟ ପ୍ରୟୋଜନ)	Point1	Point2	Point3	Point4	Point5	Point6
		Latitude ଅକ୍ଷାଂଶ					
		Longitude ଦ୍ରାଘିମାଂଶ					
17	ROUGH SKETCH OF THE TREATMENT SITE/MAP(AS AN ATTACHMENT) ସ୍ଥିତିଚିତ୍ର/ନାମାଣ୍ଡର ଚିତ୍ର (ଏକାଠି ସଂଯୁକ୍ତ ହିସାବେ)						
18	PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.fip@gmail.com ଅନୁପ୍ରାପ୍ତ କରି ଫିଲ୍ଡ ବର୍ତ୍ତମାନ ଫଟୋଗ୍ରାଫ୍ ସଂଯୁକ୍ତ କରନ୍ତୁ ଏହି (dpr2.fip@gmail.com) ଇମେଲ୍ ଆଧାରରେ						

Annexure II

Subarnrekha and Damodar Rivers and major their tributaries



Tributaries of Damodar River

Garhi

Haharo

Bokaro

Konar

Jamuniya

Kudiya

Barakar

Bhera

Darkeswar

Silabati

Tributaries of Subarnrekha River

Raru

Kanchi

Kharkai

Karkari

Garra

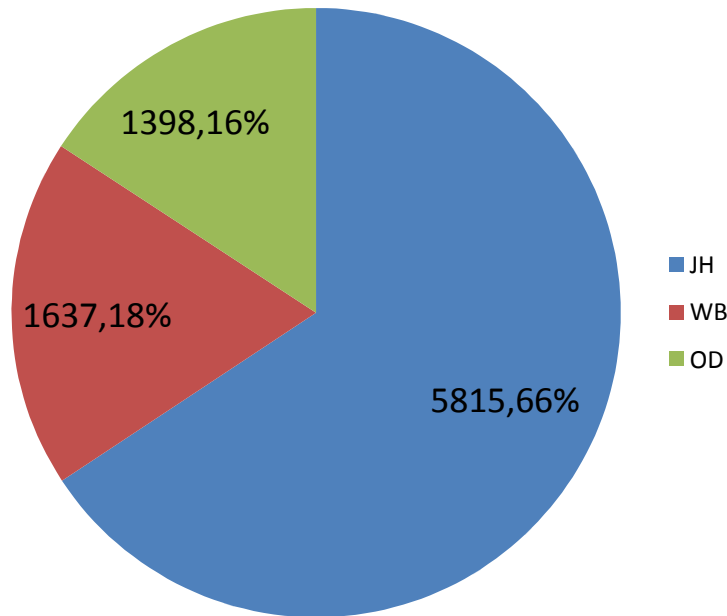
Sankh

Jumar

Dulung

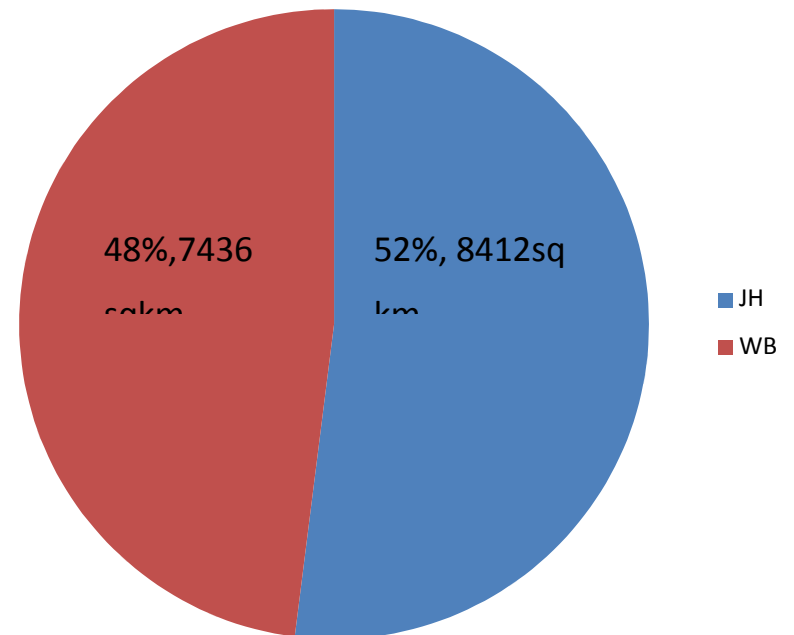
Riverscape Area @5km Buffer

Delineated Riverscape Area of Subarnrekha



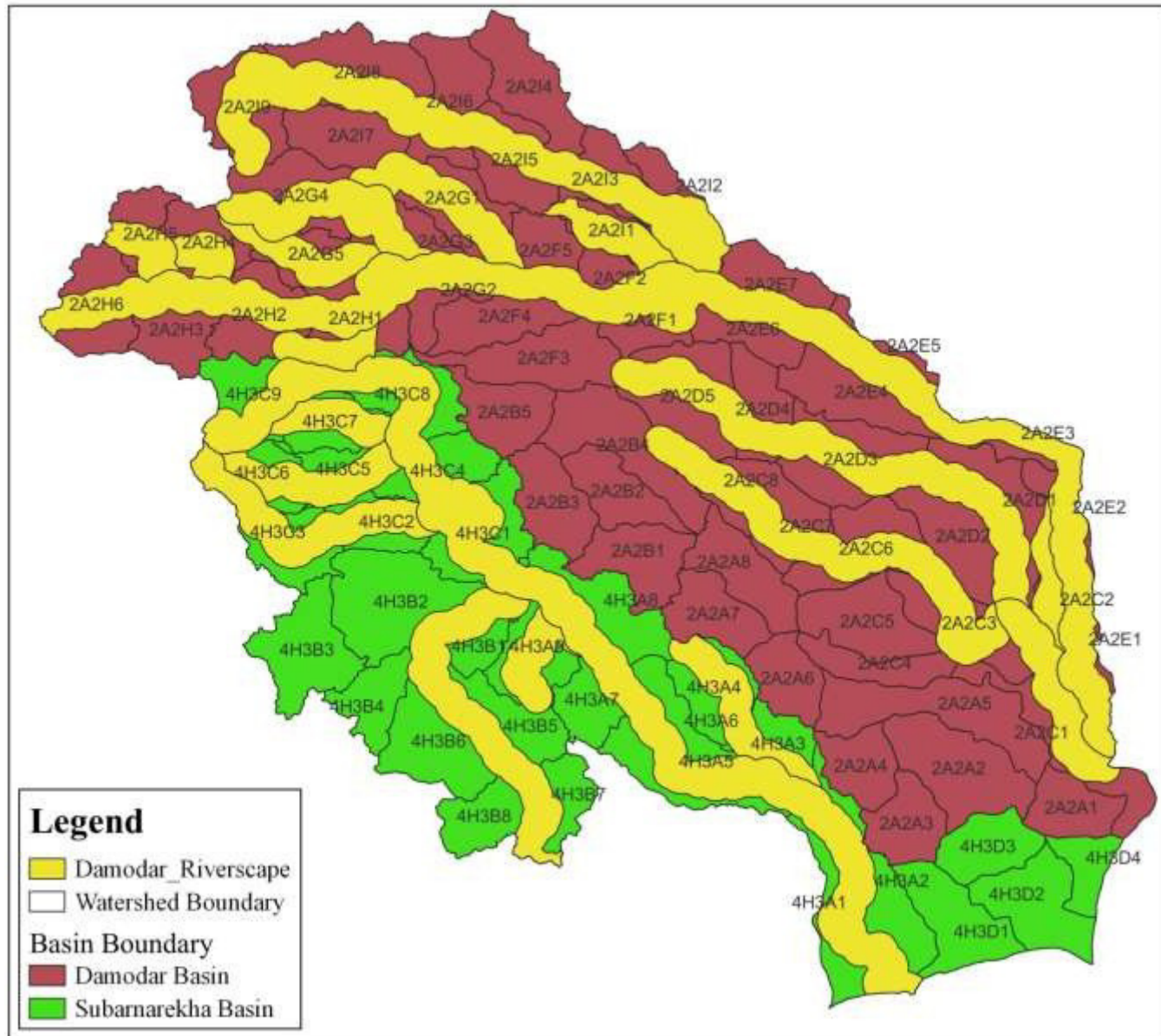
Total catchment Area 21384Sqkm
Riverscape area:8854~48%

Delineated Riverscape Area of Damodar River

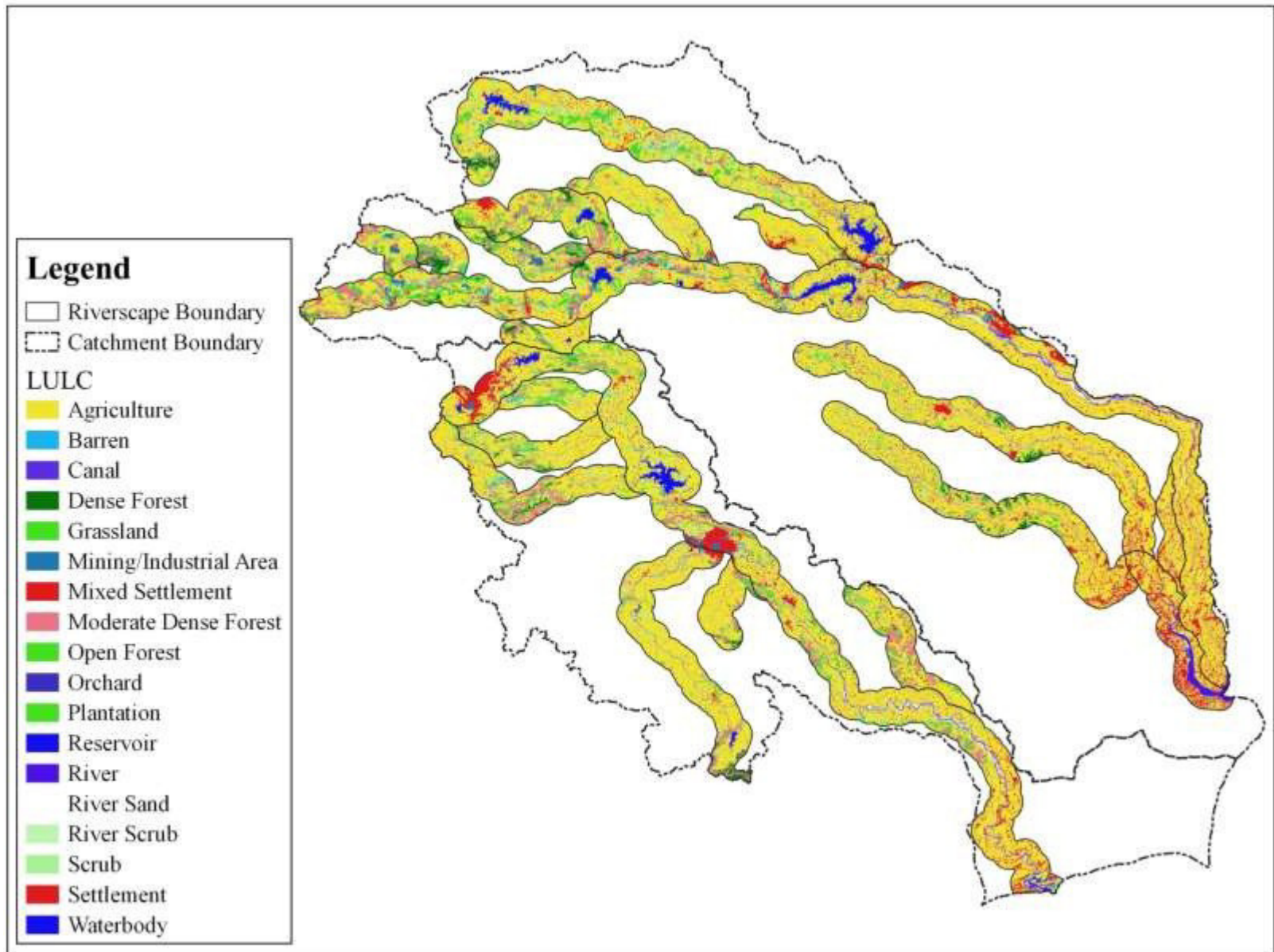


Total catchment Area 40851Sqkm
Riverscape area:15639 ~38%

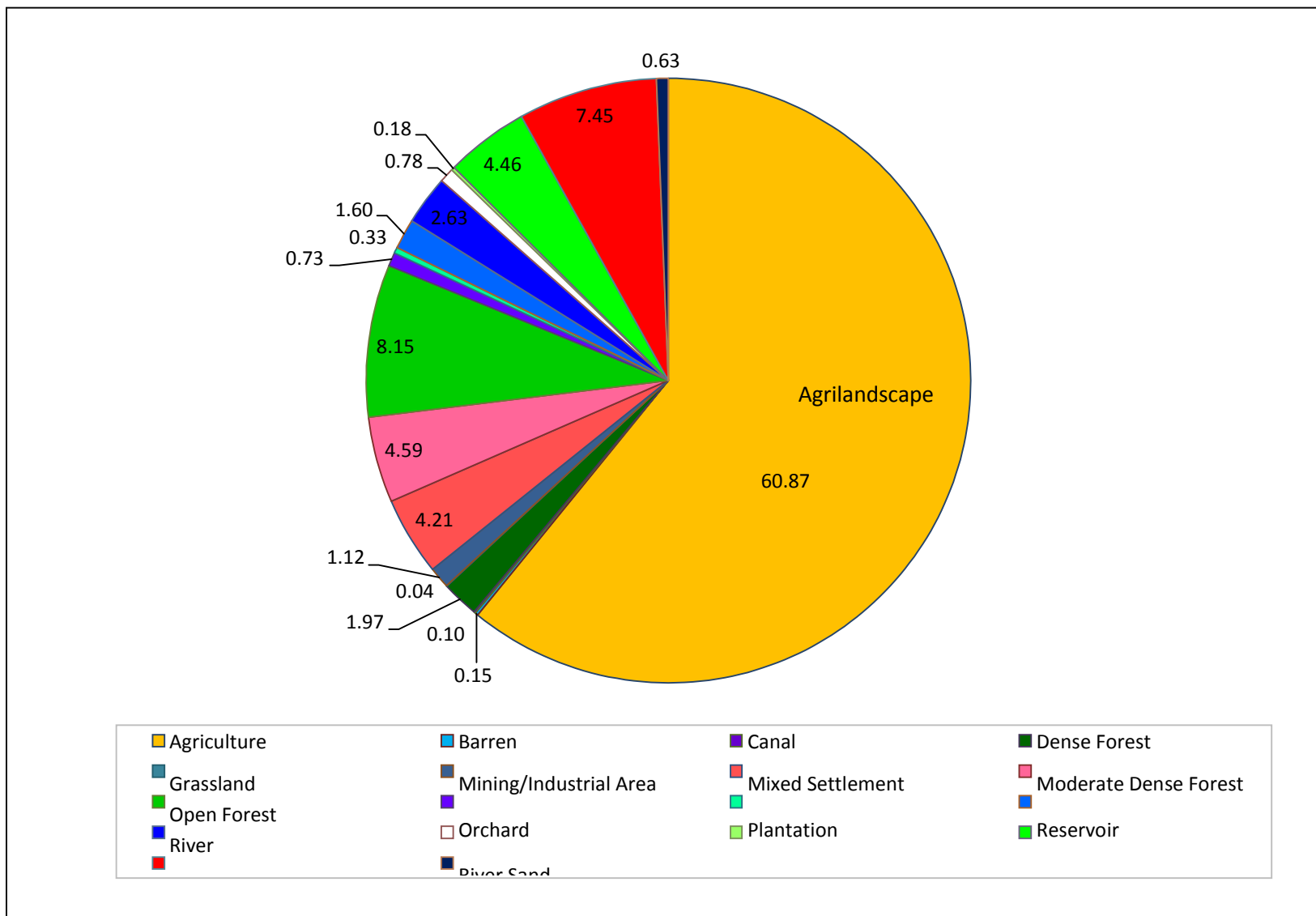
Riverscape Area Projected over Watershed Boundary



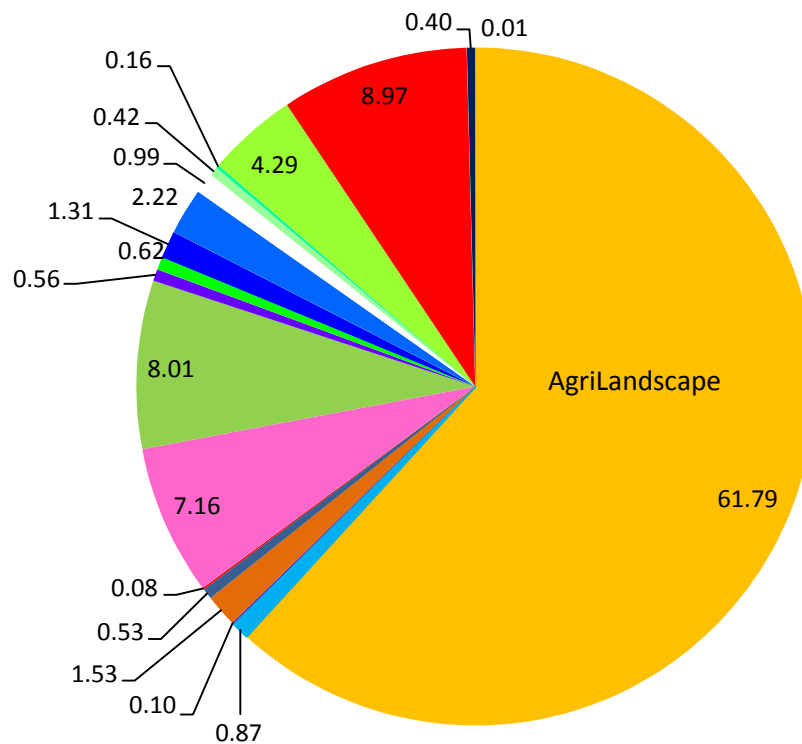
LULC Map of Riverscape Area



LULC Stats for the Damodar Riverscape (in%)

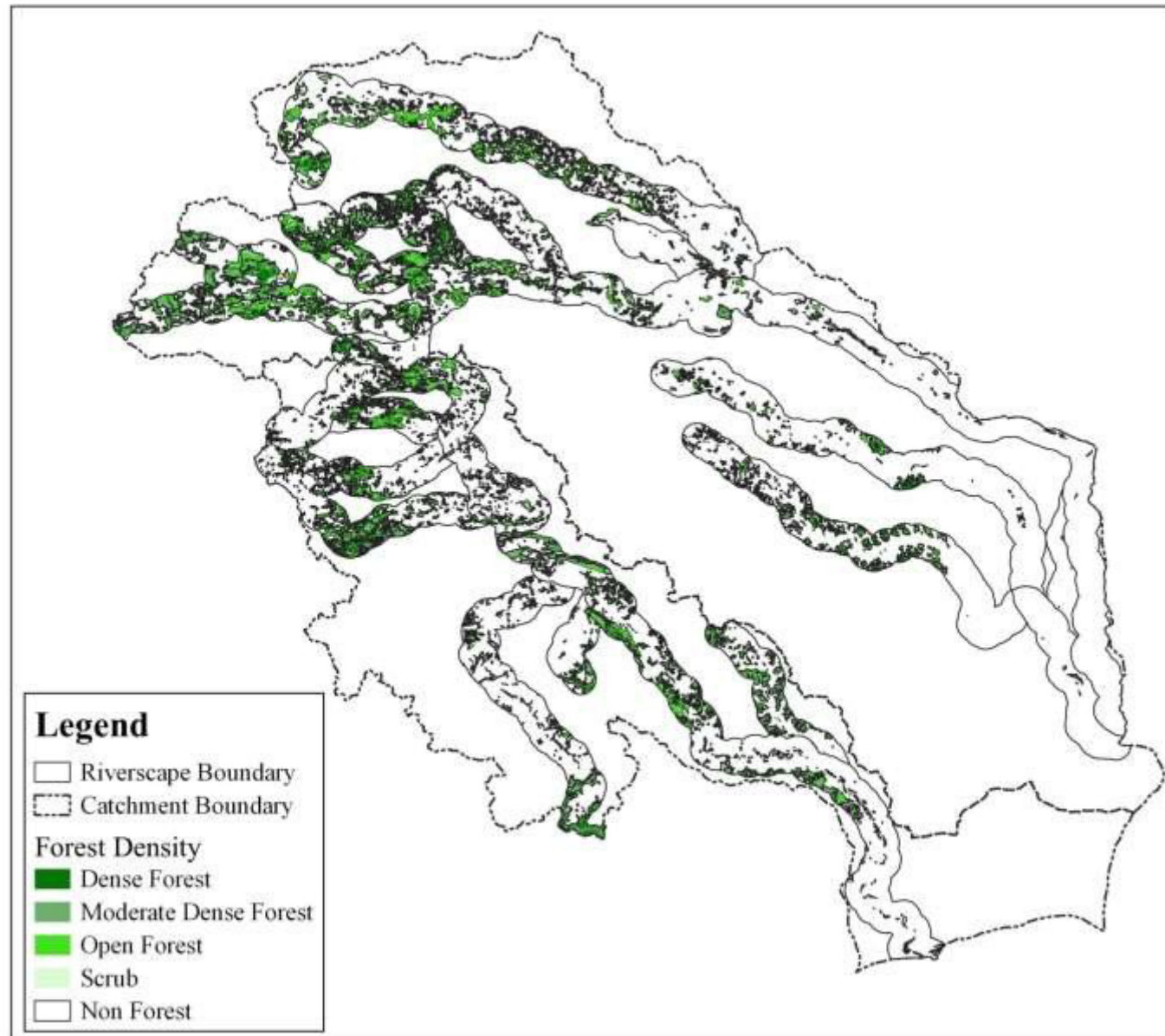


LULC stats for the Subarnarekha Riverscape (in%)



- | | | | |
|-----------------------|--------------------|----------------------------|----------------|
| ■ Agriculture Mining/ | ■ Barren | ■ Canal | ■ Dense Forest |
| ■ Industrial Area | ■ Mixed Settlement | ■ Moderate Dense Forest | ■ Open Forest |
| ■ Orchard | ■ Plantation | ■ Reservoir | ■ River |
| ■ River Sand | ■ River Scrub | ■ Sand Bar | ■ Scrub |
| ■ Settlement | ■ Water body | ■ Water logged/Marshy Land | |

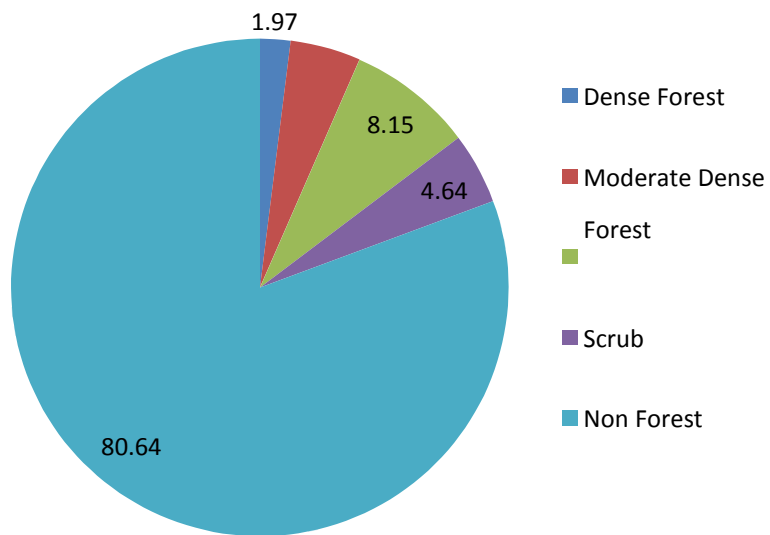
Forest Cover Map of Riverscape Area



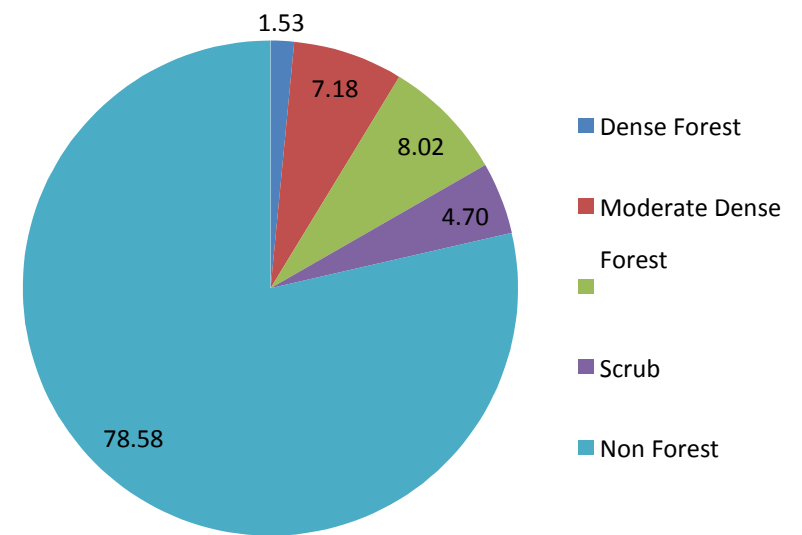
Source: FSI, Dehradun

Forest Cover wise Riverscape profile (in%)

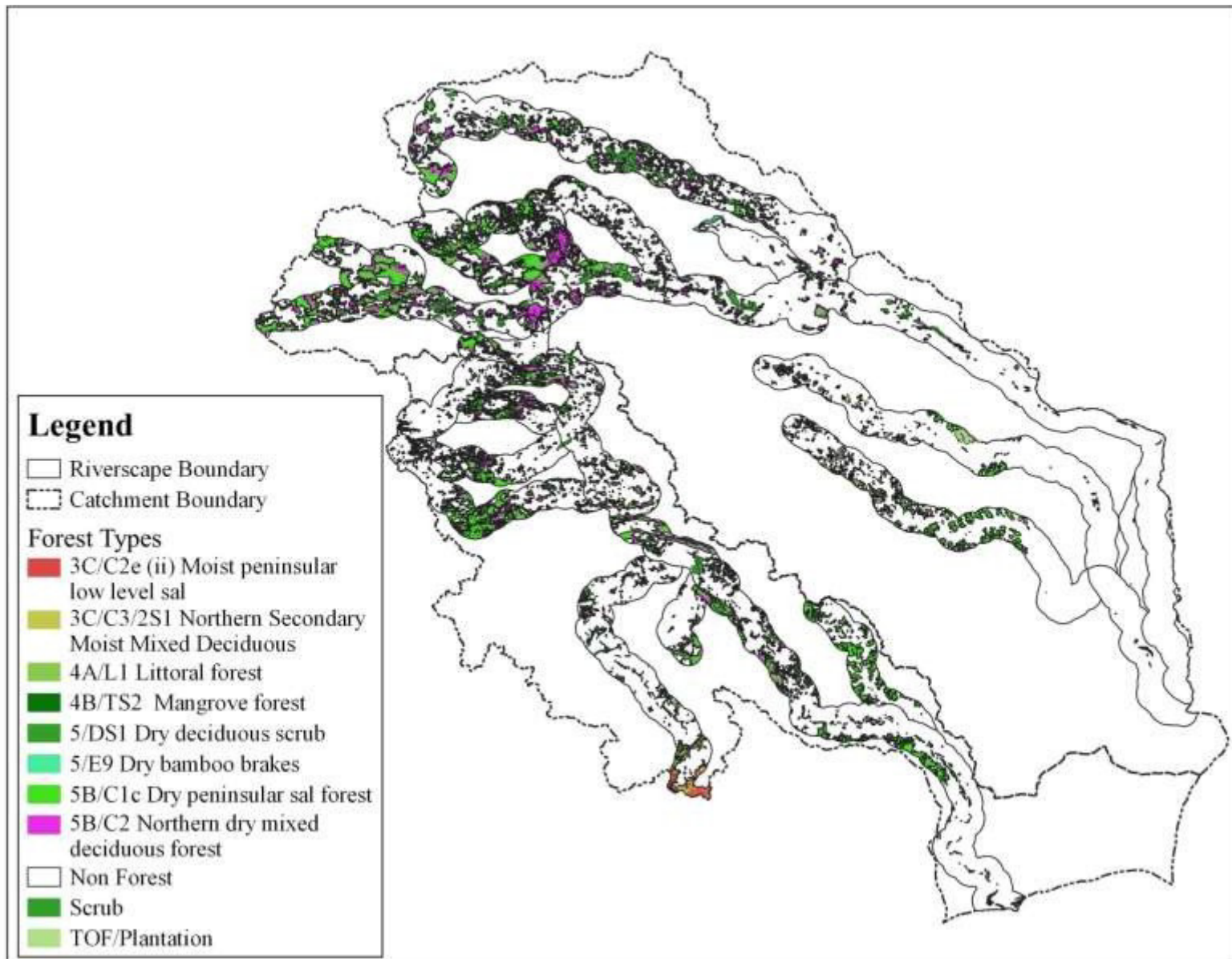
Damodar Riverscape



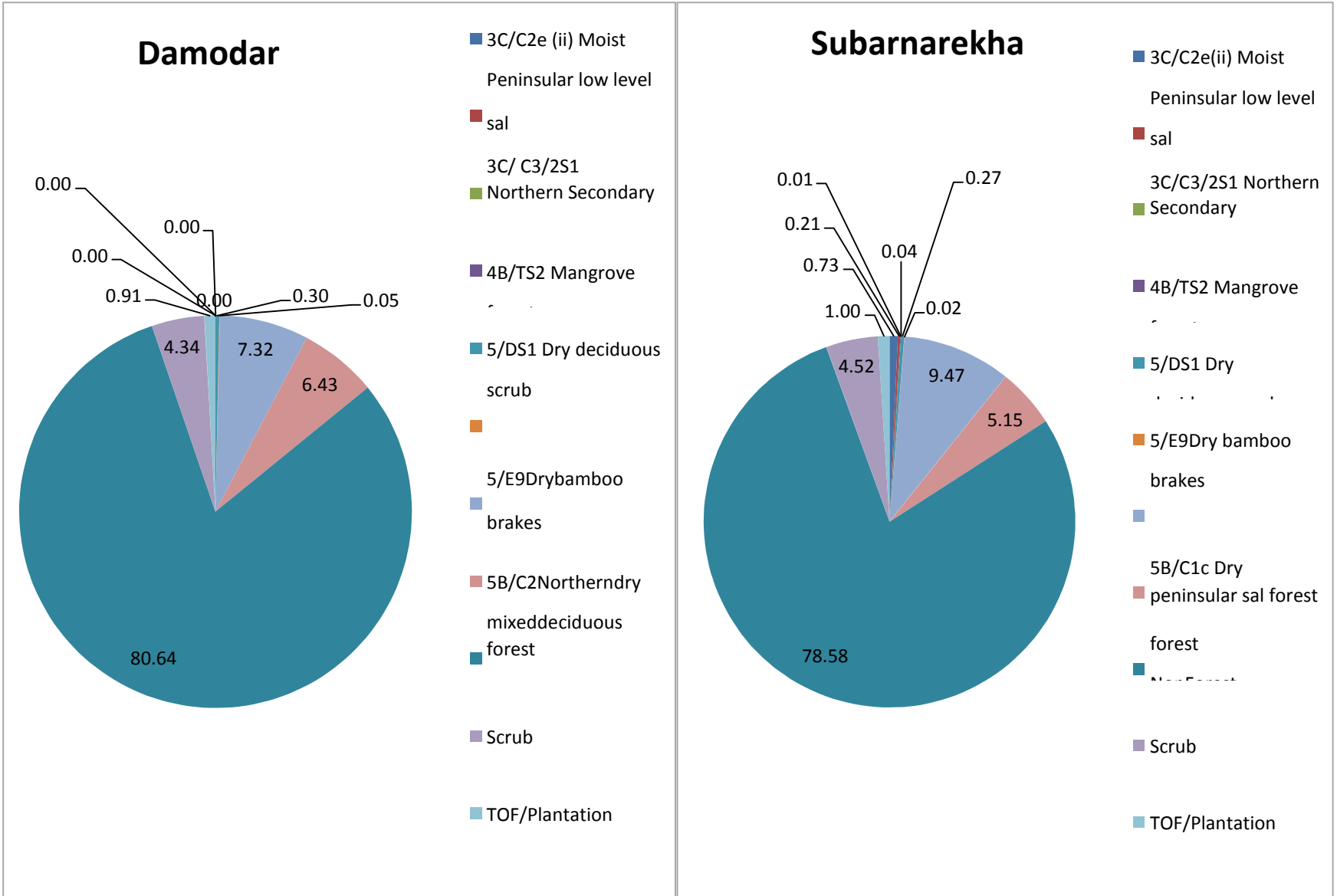
Subarnarekha Riverscape



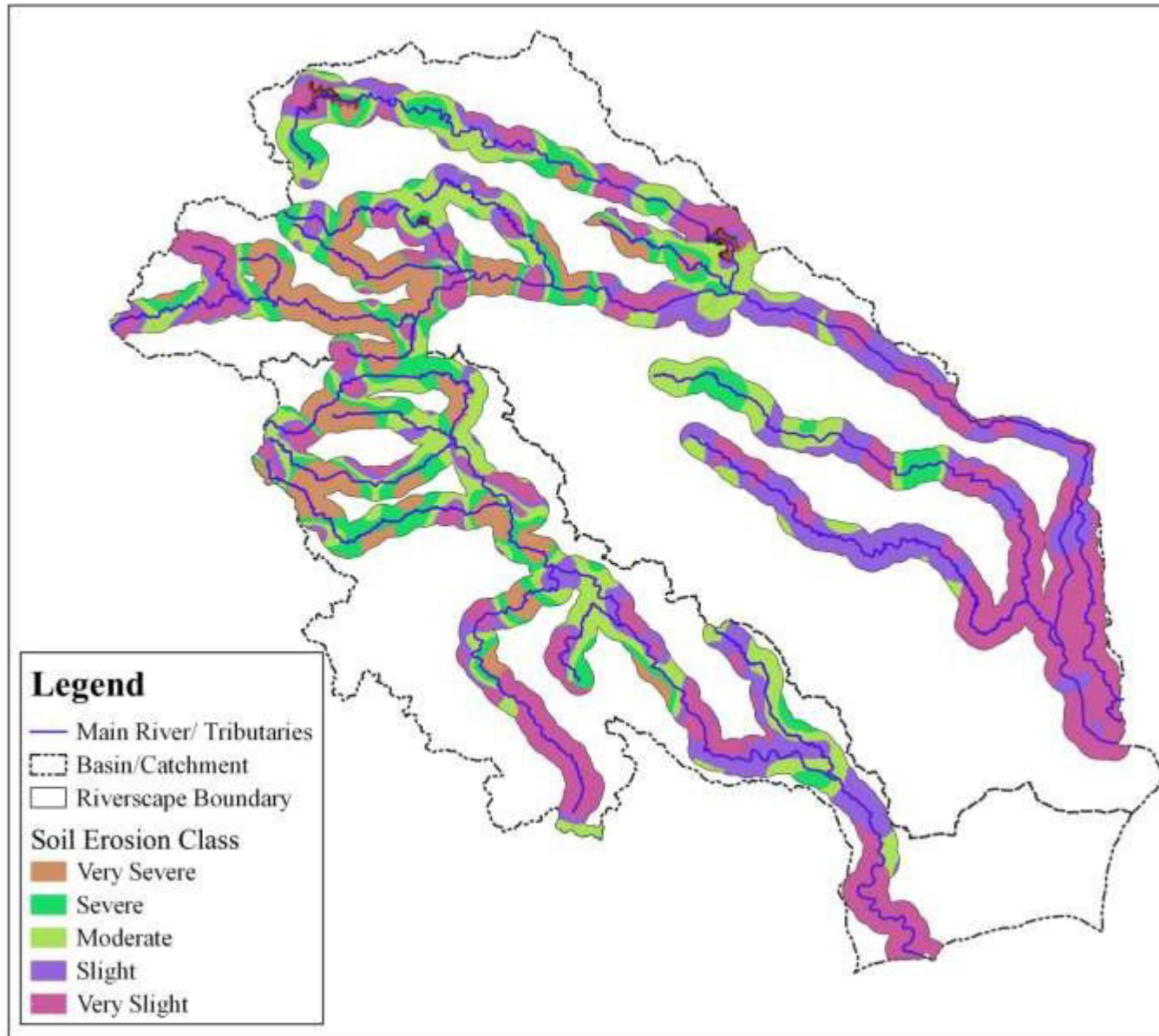
Forest Type wise Riverscape Map



Forest Type wise Riverscape profile (in%)

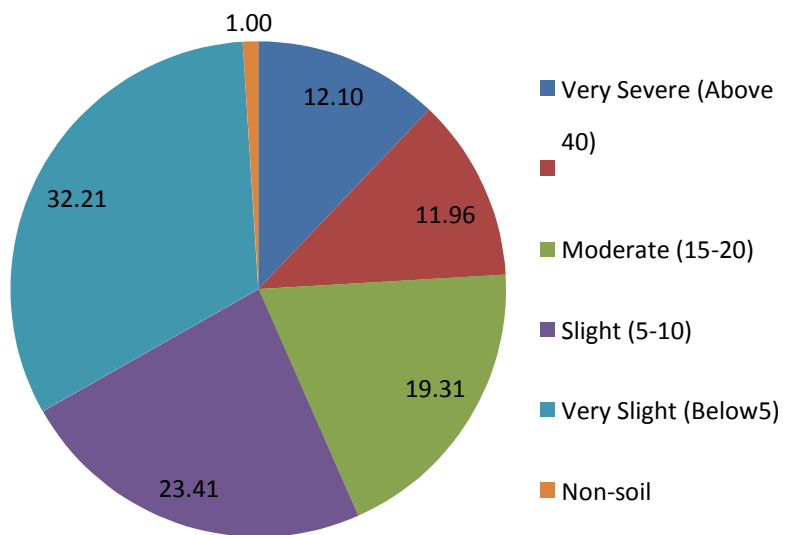


Soil erosion wise riverscape profile of Damodar River

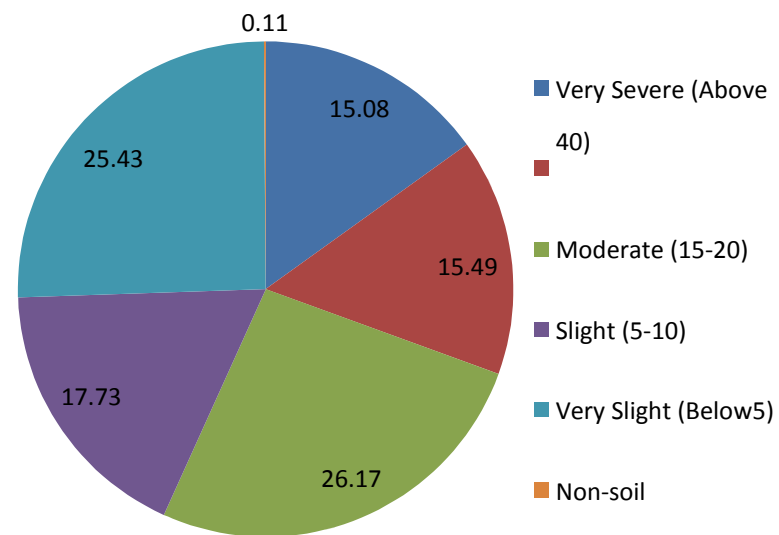


Soil Erosion Area Stats of Riverscape (in%)

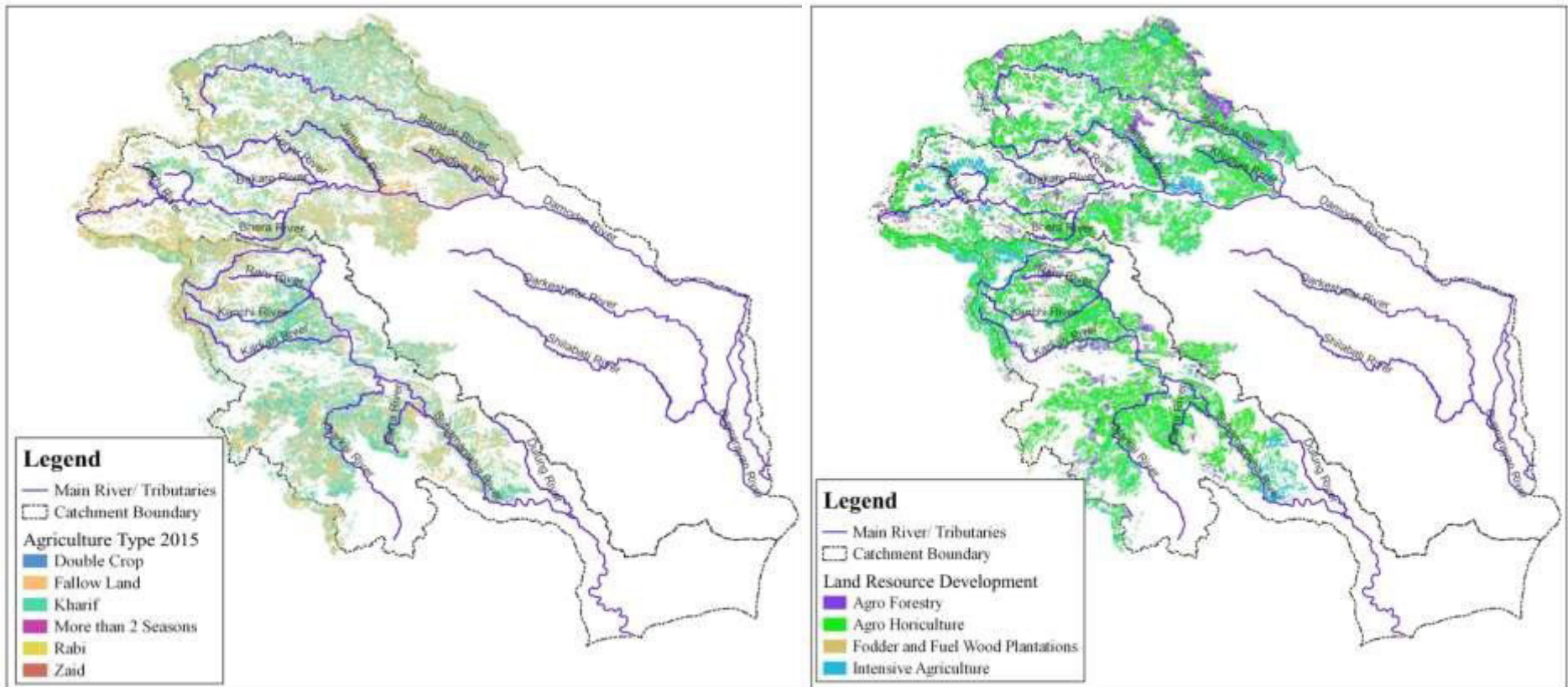
Damodar Riverscape



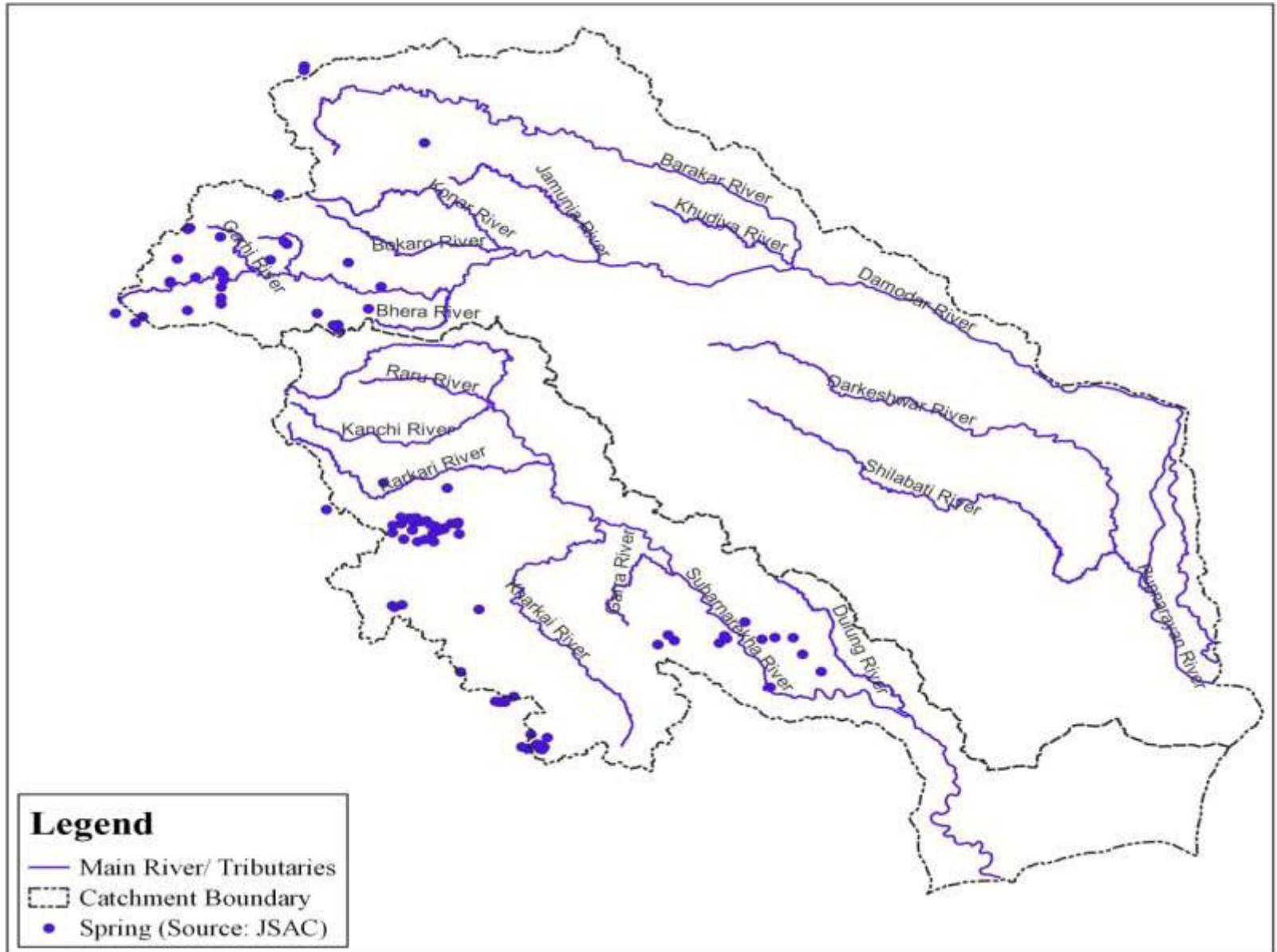
Subarnarekha Riverscape



Map depicting Agriculture Type profile for Jharkhand under the riverscape area



Spring Map of Jharkhand with in the Riverscape Catchment



Source: JSAC, Ranchi