Progress Report till March 2024

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

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**	Institute of Forest Productivity, Ranchi
3	**Project Duration**	24 Months
4	**Date of Start**	August 2022
5	**Planned Date of Completion**	September, 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- 4 Nos.

(FINANCIAL ACHIEVEMENT) (UTILIZATION CERTIFICATE ATTACHED)			
Total Budget Outlay: 1.17 Cr			
Year Wise Expenditure Details			
Financial year	**Received (Rupees in Lakh)**	**Expenditure (Rupees in Lakh)**	**Balance**
2022-23	**40.0**	**39,40,731**	**59269**
2023-24	**36.57**	**36.57**	**NIL**

Project Synopsis

This project aims to prepare a detailed project report (DPR) to rejuvenate the Damodar and Subarnarekha rivers through forestry intervention. The project has achieved significant milestones, including the stakeholder engagement through state-level workshops for SFD officials and other stakeholders including representatives from Agriculture, Horticulture, Rural, Irrigation, Revenue departments, academicians, and NGOs. A series of division-level training courses on data collection and field validation were organized to aware and train the frontline staff of various forest divisions falling within the riverscape. In accordance with stakeholder consultation, a 5 km riverscape buffer has been delineated and prepared, facilitating the participation of a wide range of stakeholders and offering a more comprehensive approach to rehabilitating different land classes, ultimately contributing to the amelioration of the riparian landscape and rivers. Additionally, a detailed geographical profile of the riverscape has been developed, comprising GIS layers including maps for watershed/micro-watershed, soil erosion, soil depth, drainage network, forest cover/type, land use and land cover (LULC), elevation, slope, and other related features. Using these GIS layers, a Multicriteria Decision Analysis Approach (MCDA) was employed to create a Priority Area Map (PAM) for the entire riverscape area, which categorizes high, moderate, and low-risk zones considering the soil degradation scenario of the riverscape. Intervention sites for the proposed landscape classes (Natural, Agriculture, and Urban) were field-validated with data concerning Natural Land class were provided by the respective forest divisions. An extensive field survey was conducted to validate the Agriculture Land class and interact with farmers to raise awareness about the proposed endeavor and understand their perspective regarding species choice. Based on the Riverscape GIS profile and stakeholder interaction, the intervention models have been developed for different land classes. The proposed measure lays the foundation for informed decision-making and targeted interventions aimed at rejuvenating and preserving the Damodar and Subarnarekha rivers. The activity wise detailed report is given in following section:

SECTION –B (PHYSICAL TARGETS AND ACHIEVEMENTS):
Target 1:
Review of existing data/information knowledge
Target Quarter: I and II
Status: COMPLETED
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 2:
Identification of knowledge gaps, scoping of forestry activities and developing strategy
Target Quarter: I and II
STATUS: COMPLETED
On the basis of consultation with stakeholders, a 5Km riverscape buffer for the entire study area including rivers Damodar, Subarnrekha and their major tributaries was generated. Consequently, following major tributaries were included. 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 address river pollution.

Sl. No.	Tributaries for Damodar River	Tributaries for Subarnrekha River
1	Garhi	Raru
2	Haharo	Kanchi
3	Bokaro	karkari
4	Konar	Kharkai
5	Jamuniya	Dulung
6	Kudiya	Sankh
7	Barakar	Jumar
8	Bhera	Garra
9	Darkeswar	
10	Sila/Shilabati	

Target 3:	**Identification of stakeholders/ academia/ experts/ organizations/ agencies for developing implementation plan on forestry interventions**
Target Quarter:	**Quarter I and II**
STATUS: COMPLETED	
Due to the presence of a variety of land classes, including natural, agricultural, and urban, in the riversacpe, all relevant departments such as Forest, Agriculture, Horticulture, Mining & Industries, Land resources, Urban and Rural development were identified as 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).	

Target 4 & 5:	
Conduction of kick off meeting/Workshop & brain storming session with state representative	
Target Quarter:	**Quarter I, II, and III**
STATUS Completed	
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 and 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.	

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

Figure 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, 2022 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.

Figure 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. In addition to these major meets, numerous interaction meets with stakeholders such as was with Director, Sericulture, West Bengal, Director, Agriculture, Jharkhand, Head, Environment, CCL, Ranchi was carried out.

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.

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

Target 6:	**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)**
STATUS: COMPLETED	
Based on stakeholder discussion it was decided to consider a uniform 5 km riverscape buffer for Damodar and Subarnrkha and their major tributaries. Accordingly, the riverscape has been prepared.	
Collection of primary data (Slope, Aspect, Elevation, Temperature, Precipitation, Administrative Boundary, Village Data, and 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 Jharkhand has been acquired from JSAC, Ranchi.	
Designing data collection forms in bilingual for all three states has been completed (Attached Photos in Annexure-1).	
A priority area map for the entire riverscape for both the rivers have been prepared.	
An elephant corridor map for the riverscape area has been prepared.	
Location maps for the proposed intervention sites for the natural and agriculture landscape has been prepared	
Drainage area network map for Jharkhand, West Bengal, and Odisha has been developed.	
Division-wise area analysis has been carried out. Accordingly, the potential intervention areas in the Natural, and Agriculture landscape has been identified. (Annexure III)	

Target 7:	**Interaction with front end staff of SFD for explaining Data collection mechanism and data collection**
STATUS: Completed.	
Some of the divisions requested retraining, and that is being done. Further, the issues with the intervention data received from the field are being taken up with the concerned forest divisions.	
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

Sl No	Name of Division	Date of Training	Revise 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	30-11-2023
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	

Figure 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

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

Odisha

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	Rairangpur	30-01-2023
2	Baripada	30-01-2023
3	Balasore	30-01-2023

Figure7: Photographs of Front-line staff held training programs held at Baripada forest divisions of Odisha.

Target 8: Field visits and survey of prioritized sites, data collection, and analysis
Target Quarter: **Quarter IV, and V**
STATUS: **COMPLETED**
Field Survey: Completed for the entire study area.
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 has 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, Odisha 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.

GIS ANALYSIS: COMPLETED
Riverscape Analysis: Complete for all the stakeholder states i.e. West Bengal, Jharkhnad, and Odisha. Based on GIS analysis, information concerning Riverscape area, priority area, LULC profile including Natural Landcape, Agriculture Landcape, Urban, Water body, Fallow land, Aquifer maps, Industries, Watershed profile, Soil profile, Forest Division area prioritization, Potential sites for intervention, Village profile, and other related profile have been generated. Some of these data facts are shown through Attachment II.

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

Figure 9: Origin point of River Damodar at ChulhaPani, Lohardaga, Jharkhand. Location Coordinates: 23037'10.73'' N, 84040'07.37''E. The river originates from underground spring locally called as 'Chuan".

Figure 10: Origin point of River Barakar at Fuldaha, Hazaribagh, and Jharkhand. Location Coordinates: 24° 7'3.63"N, 85°21'25.03"E.

Figure. 11: Origin point of River Konar at Sultana, Hazaribagh, Jharkhand. Location Coordinates: 23°58'47.96"N, 85°16'5.65"E.

Figure. 12: Hindalco industry along Subarnarekha River near Muri, Jharkhand

Figure. 13: Damodar River near Jharia Mines, Sindri, Dhanbad, Jharkhand

Figure. 14: Durgapur Barrage on Damodar River near Durgapur City, West Bengal

Figure. 15: Maithan Dam on Barakar River at Maithan, Jharkhand

Figure. 16: Panchet Dam on Damodar River at Panchet, Jharkhand

Figure. 17: Barakar River site at Barakar, West Bengal

Figure. 18: Khudia River site at Luhchibad, Jharkhand

Figure. 19: Darkeswar River site at Bankura, West Bengal

Figure. 20: Mining area near Koiridih, Jharkhand. The entire stretch especially of river Damodar is dominated by the mining blocks.

Figure.21: Check dam on Koel 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.

Figure. 22: River Damodar along Sindri-Govindpur road. The photograph depicts a mining patch along the riverbed on 1st January, 2023.

Figure. 23: River Damodar along Dhanbad- Bokaro Road on 29th November, 2022.

Figure.24: Illustrating villagers about the benefits of plantation along riverside at Chapardiha, Giridih division, on 24th March, 2023.

Figure.25: Interaction with villagers at Barai village, Hazaribagh(E) division, on 24th March, 2023.

Figure.26: Photograph taken while listing down the suggestions given by the villagers at Banhar Nawada village, Hazaribagh(W) on 24th March, 2023.

Figure.27: Agriculture survey at Sirkadih village, Ranchi division on 19th December, 2023.

Figure.28: Agriculture land at Bhursudih village, Ranchi division on 19th December, 2023.

Figure.29: Agriculture land at Chauga village, Ranchi Division on 19th December, 2023.

Figure.30: Agriculture survey at Anidih village, Kunti division on 05th December, 2023.

Figure.31: Agriculture survey at Bagri village, Kunti division on 09th December, 2023.

Figure.32: Agriculture survey at Bhursa village, Kunti division on 07th December, 2023.

Figure.33: Agriculture survey at Doriya village, Kunti division on 08th December, 2023.

Figure.34: Interaction with farmers during survey at Ganeor village, Kunti division on 06th December, 2023.

Figure.35: Agriculture survey at Ghasibari village, Kunti division on 04th December, 2023.

Figure.36: Agriculture survey at Sosokuti village, Kunti division on 08th December, 2023.

Figure.37: Agriculture survey at Serenghatu village, Kunti division on 08th December, 2023.

Figure.38: Farmer interaction at Gurwa village, Hazaribagh division on 21st December, 2023.

Figure.39: Farmer interaction at Gobindpur village, Ramgarh division on 21st December, 2023.

Figure.40: Farmer interaction at Katkamdag village, Hazaribagh division on 21st December, 2023.

Figure.41: People interaction at Seota village, Ramgarh division on 20th December, 2023.

Figure.42: Farmer interaction at Ladi village, Ramgarh division on 20th December, 2023.

Figure.43: Agriculture survey/Land at Gharsat village, Howrah division on 28th December, 2023 .

Figure.44: Agriculture survey at Koalu village, Ranchi division on 20th January, 2024 .

Figure.45: Agriculture survey at Piparbanda village, Ranchi division on 20th January, 2024 .

Figure.46: Agriculture survey at Gardag village, Latehar division on 18th January, 2024.

Figure.47: Team interacting villagers at Manatu village, Latehar division on 18th January, 2024.

Figure.48: Agriculture survey/Land at Chitrada village, Baripada division on 31th January, 2024 .

Figure.49: Agriculture survey at Dhansol village, Baripada division on 31th January, 2024 .

Figure.50: Team interacting villagers at Dhansol village, Balasore division on 31th January, 2024 .

Figure.51: Agriculture survey at Bali Bandh village, South Bankura division on 30th January, 2024.

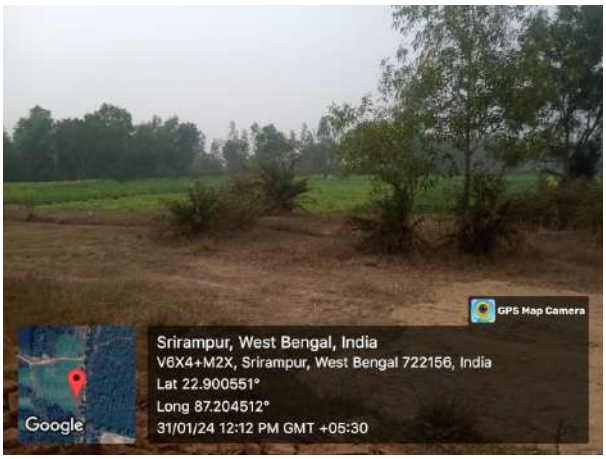


Figure.52: Agriculture survey at Simlipal village, South Bankura division on 30th January, 2024.

Target 9: Preparation of Intervention models/Draft DPR
STATUS: Completed for West Bengal
Target Quarter: **Quarter IV, and V**
Intervention models for NATURAL, AGRICULTURE and URBAN LANDSCAPE have been prepared and **completed for West Bengal**. In the current DPR we have proposed 5 intervention models for Natural landscape, 01 for Agriculture landscape, and 02 models are proposed for Urban Landscape. These models have been provided to SFD, for its review, so that the same can be better discussed during the proposed workshop.
The models for the Jharkhand and Odisha are being prepared. The progress for Jharkhand and Odisha was **affected due to delay in receiving data** for the intervention sites from Jharkhand and Odisha SFD. This part will be completed by 25th April.
For Jharkhand, intervention sites data for Natural Landscape are received from six forest divisions. The matter is taken up with the PCCF and HoFF, Jharkhand and assured of expedited by 20th April. At the same time field survey for the Agriculture Landscape has been completed.
Writing Draft Report
The draft report is being prepared. We are writing separate reports for the Damodar and Subararekha rivers. Reports concerning each river will have Two Volumes. The first draft chapters on Introduction, Riverscape Profile, Intervention Approach, and Implementation mechanisms has been completed under Vol I for both the rivers. Under Vol II The writing for state-wise chapters is in progress. In this part, the state chapter for West Bengal has been completed for both the rivers. For Jharkhand, and Odisha the state chapters are partially completed. The part of the chapter concerning intervention models and budget will be expected to be completed by 30th April. Part of these chapters depends upon Proposals from the stakeholder states. It is expected to get the data from remaining sites by 20th April, 2024.

Target 10: Conduction of final state level consultation workshop to discuss draft DPR for finalization
Target Quarter: **Quarter V, and VI**
Conduction of final state level consultation workshop to discuss draft DPR for finalization for WB is proposed in April, 2024, and for Jharkhand in May 2024.We have requested SFD, West Bengal, for the convenient date for the workshop. The workshop is proposed in HYBRID MODE.

Constraints:

The progress of the work was affected due to the late release of funds. The fund for the current financial year was released in September 2023. The hired research fellows left the project, and this required the reappointment of project staff. The field surveys could not be taken up. All this affected the activities, and the expected target could not be timely achieved. Another factor that affected the timely execution of target was due to Delay in receiving field data for intervention sites from the concerned forest department. The target for West Bengal has been completed, but got compromised for Jharkhand as complete data is still awaited. We have discussed the matter with PCCF and HoFF, Jharkhand. He has taken serious note of it and assured to expedite the issue by 20th April, 2024.

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

Sl 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 finalization 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					~	~

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 (स्वर्णरेखा)**			
B. LANDSCAPE (Check the Box) परिदृश्य (बॉक्स को चेक करें)	**FOREST** वन		**AGRICULTURE** कृषि		**URBAN** शहरी		**OTHER** अन्य	
C. INTERVENTIONS हस्तक्षेप **(Check the Box)** (बॉक्स को चेक करें)	Plantation Activity वृक्षारोपण गतिविधि				Wetland Management (Natural & Artificial) आर्द्रभूमि प्रबंधन			
	Bioremediation & Bio filtration जैविक उपचार तथा बायोफिल्ट्रेशन				Riparian Wildlife Management नदी तट वन्यजीव प्रबंधन			
	River Front Development & Ecotourism नदी किनारा विकास तथा पर्यावरण पर्यटन				Soil and Water Conservation मृदा और जल संरक्षण			
	Eco Park Development पर्यावरण पार्क विकास				Institutional/Industrial Plantation संस्थानों/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 परिक्षेत्र)	
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 वनस्पतियों और जीवों की वर्तमान स्थिति (Existing Biodiversity) (मौजूदा जैव विविधता)	Trees (पेड़)	Herbs (जड़ी बूटी)	Shrubs (झाड़ियाँ)	Fauna (जीव)

2	Legal Status of Land (भूमि की कानूनी स्थिति) (Check the Box (बॉक्स को चेक करें)	Forest Land का 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 (मैदान)				
5	Average Annual Rainfall (in mm)* औसत वार्षिक वर्षा (मिलीमीटर में)							
6	Special Features of Land* (भूमि की विशेष विशेषताएं)							
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) नाम सहित मुख्य 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 (जड़ी बूटी)		Shrubs (झाड़ियाँ)		
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 वर्षों 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 (अनुलग्नक के रूप में)							
18.	**PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.ifp@gmail.com** **dpr2.ifp@gmail.com** मेल आईडी में कुछ वर्तमान फोटोग्राफ लगे							

*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 - 835303)

A. RIVERSCAPE	**DAMODAR** (দামোদর)				**SUBARNAREKHA** (সুবর্ণরেখা)			
B. LANDSCAPE (Check the Box) ভূ-দৃশ্য (বাক্সটি যাচাই করুন)	**FOREST** বন		**AGRICULTURE** কৃষি		**URBAN** পৌর		**OTHER** অন্যান্য	
C. INTERVENTIONS হস্তক্ষেপ **(Check the Box)** (বাক্সটি যাচাই করুন)	Plantation Activity বৃক্ষরোপণ কার্যকলাপ				Wetland Management (Natural & Artificial) জলাভূমি ব্যবস্থাপনা			
	Bioremediation & Biofiltration বায়োরিমিডিয়েশন ও বায়োফিল্টেশন				Riparian Wildlife Management নদীতীরস্থ বন্যপ্রাণী ব্যবস্থাপনা			
	River Front Development & Ecotourism নদী সম্মুখ উন্নয়ন এবং ইকোট্যুরিজম				Soil and Water Conservation মাটি ও জল সংরক্ষণ			
	Eco Park Development ইকো পার্ক উন্নয়ন				Institutional/Industrial Plantation প্রাতিষ্ঠানিক/ শিল্প বৃক্ষরোপণ			
	Any Other (Please Specify.....) অন্য আরও কিছু (নির্দিষ্ট করুন.....)							

	D. TREATMENT SITE (DETAILS) (হস্তক্ষেপ স্থান (বিশদ বিবরণ))	
1	Name Of Site (স্থানের নাম)	
2	Area (In Hectare) (এলাকা (হেক্টরে)	
	E. GEOGRAPHICAL DETAILS (ভৌগলিক 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 বীট)	
7	Block Name (ব্লকের নাম)	
8	Tehsil (তহসিল)	
9	Panchayat (পঞ্চায়েত)	

	F. BASELINE DATA (ভূমিরেখা তথ্য)				
1	Current Status Of Flora And Fauna উদ্ভিদ ও প্রাণীর বর্তমান অবস্থা (Existing Biodiversity) (বিদ্যমান জীববৈচিত্র্য)	Trees (গাছ)	Herbs (তৃণ)	Shrubs (ঝোপঝাড়)	Fauna(প্রাণী)

2	Legal Status of Land (জমির আইনসত 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* (ভূ-তত্ত্ব এবং মাটির ধরন)							
4	Terrain (check the box)ভূখণ্ড (বাক্সটি যাচাই করুন)	Hill (পাহাড়ী)			Plain (সমভূমি)			
5	Average Annual Rainfall (in mm)* বার্ষিক গড় বৃষ্টিপাত (মিলিমিটারে)							
6	Special Features of Land* (জমির বিশেষ বৈশিষ্ট্য)							
7	Distance from nearest Road (Approx. in m) নিকটতম রাস্তা থেকে দূরত্ব (মিটারে)							
8	Distance from main river/tributary with name (Approximate in m) নামের সাথে প্রধান নদী/উপনদী 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 (তৃণ)		Shrubs (ঝোপঝাড়)		
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	Year 05		
13	Planting Cost Including Nursery (Approx. in Lakhs) নার্সারি সহ রোপণ খরচ (আনুমানিক লাখে)	Year 01	Year 02	Year 03	Year 04	Year 05		
14	Maintenance Cost of plantation with years (Approx. in Lakhs) বছরের সাথে গাছ লাগানোর রক্ষণাবেক্ষণ খরচ (আনুমানিক লাখে)	Year 01	Year 02	Year 03	Year 04	Year 05		
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) সমস্ত কোণে সাইটের জিপিএস স্থানাঙ্ক (সাইটের আকার অনুযায়ী, ন্যূনতম 4 পয়েন্ট প্রয়োজন)		Point1	Point2	Point3	Point4	Point5	Point6
		Latitude অক্ষাংশ						
		Longitude দ্রাঘিমাংশ						
17.	**ROUGH SKETCH OF THE TREATMENT SITE/MAP(AS AN ATTACHMENT)** ট্রিটমেন্ট সাইট/মানচিত্রের রুক্ষ স্কেচ (একটি সংযুক্তি হিসাবে)							
18.	**PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.ifp@gmail.com** অনুগ্রহ করে কিছু বর্তমান ফটোগ্রাফ সংযুক্ত করুন এই (dpr2.ifp@gmail.com) মেইল আইডিতে							

*Not Mandatory (বাধ্যতামূলক নয়)

Data Collection Format in Odia (ଓଡିଆ)

DPR PREPARATION OF FORESTRY INTERVENTIONS FOR DAMODAR & SUBARNAREKHA

PROFORMA OF DATA COLLECTION FOR PROPOSED SITE

(INSTITUTE OF FOREST PRODUCTIVITY, RANCHI - 835303)

A. RIVERSCAPE	**DAMODAR (ଦାମୋଦର)**			**SUBARNAREKHA (ସୁବର୍ଣ୍ଣରେଖା)**			
B. LANDSCAPE (Check the Box) ଲ୍ୟାଣ୍ଡସ୍କେପ୍	(ବାକ୍ସ ଯାଞ୍ଚ କରନ୍ତୁ)	**FOREST** ଜଙ୍ଗଲ		**AGRICULTURE** କୃଷି		**URBAN** ସହର		**OTHER** ଅନ୍ୟ	
C. INTERVENTIONS ହସ୍ତକ୍ଷେପ	**(Check the Box)** (ବାକ୍ସ ଯାଞ୍ଚ କରନ୍ତୁ)	Plantation Activity ବୃକ୍ଷରୋପଣ କାର୍ଯ୍ୟକଳାପ			Wetland Management (Natural & Artificial) ଆର୍ଦ୍ରଭୂମି ପରିଚାଳନା		
		Bioremediation & Bio filtration ବାୟୋରେମିଡିଏସନ୍ ଏବଂ ବାୟୋଫିଲ୍ଟ୍ରେସନ୍			Riparian Wildlife Management ରିପାରିୟାନ୍ ୱାଇଲ୍ଡ ଲାଇଫ୍ ମ୍ୟାନେଜମେଣ୍ଟ		
		River Front Development & Ecotourism ନଦୀତଟ ବିକାଶ ଏବଂ ଇକୋଟୋରିଜିମ୍			Soil and Water Conservation ମୃତ୍ତିକା ଏବଂ ଜଳ ସଂରକ୍ଷଣ		
		Eco Park Development ଇକୋ ପାର୍କ ବିକାଶ			Institutional/Industrial Plantation ଅନୁଷ୍ଠାନ / ଶିଳ୍ପ ବୃକ୍ଷରୋପଣ		
		Any Other (Please Specify.....) ଅନ୍ୟ କୋଉଟି (ଦୟାକରି ଉଲ୍ଲେଖ କରନ୍ତୁ .....)					

D. TREATMENT SITE (DETAILS) ପରିଚାଳନା ସ୍ଥାନ (ବିସ୍ତୃତ ବିବରଣୀ)		
1	Name Of Site (ସ୍ଥାନ ନାମ)	
2	Area (In Hectare) (କ୍ଷେତ୍ର (ହେକ୍ଟରରେ))	
E. GEOGRAPHICAL DETAILS (ଭିତ୍ତିଗାତ୍ରିକ୍ ବିବରଣୀସମୂହ)		
1	State (ରାଜ୍ୟ)	
2	District (ଜିଲ୍ଲା)	
3	Forest Divisions (ଜଙ୍ଗଲ ବିଭାଗ)	
4	Forest Range (ଜଙ୍ଗଲ ପରିସର)	
5	Forest Block (ଜଙ୍ଗଲ ବ୍ଲକ)	
6	Forest Beat (ଜଙ୍ଗଲ ବିଟ୍)	
7	Block Name (ବ୍ଲକ ନାମ)	
8	Tehsil (ତହସିଲ)	
9	Panchayat (ପଞ୍ଚାୟତ)	

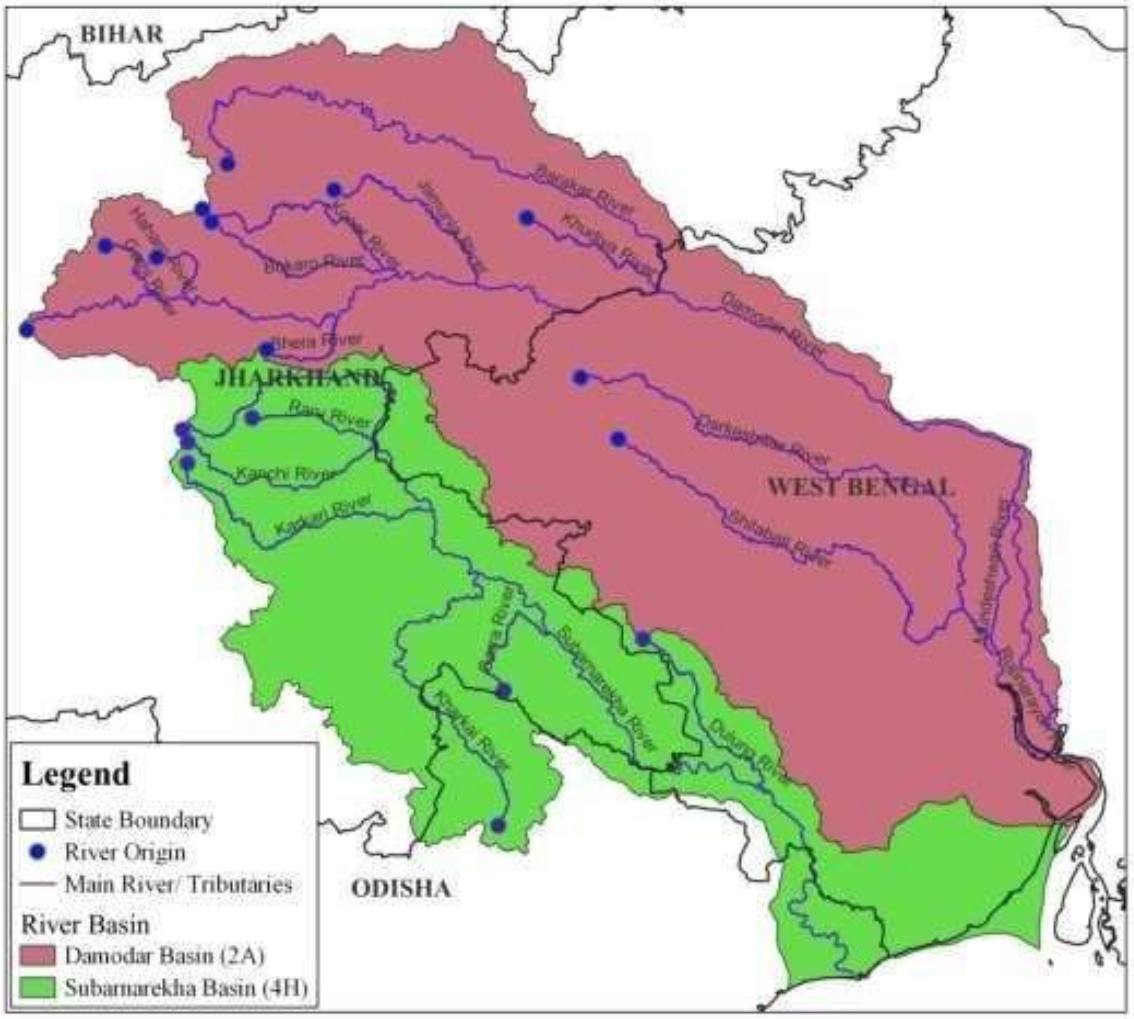
F. BASELINE DATA (ବେସଲାଇନ୍ ତଥ୍ୟ)					
1	Current Status Of Flora And Fauna ଉଦ୍ଭିଦ ଏବଂ ପଶୁ ର ସାମ୍ପ୍ରତିକ ସ୍ଥିତି (Existing Biodiversity) (ବିଦ୍ୟମାନ ଜୈବ ବିବିଧତା)	Trees (ଗଛପ୍ରତିକ)	Herbs (ଘାସ)	Shrubs	Fauna (ପଶୁ)

2	Legal Status of Land (ଜମିର ଆଇନଗତ ଅବସ୍ଥା) (Check the Box (ବାକ୍ସଟି ଯାଚାଇ କରନ୍ତୁ))	Forest Land ବନଭୂମି		Private Land ବ୍ୟକ୍ତିଗତ ଜମି		Lease land ଇଜାରା ଜମି	
		Revenue Land ରାଜସ୍ୱ ଜମି		Community Land ସମ୍ପ୍ରଦାୟର ଜମି		Any Other ଅନ୍ୟ କିଛୁ	
3	Geology and Soil Type* (ଭୂ-ତତ୍ତ୍ୱ ଏବଂ ମାଟିର ଧରନ)						
4	Terrain (check the box)ଭୂଖଣ୍ଡ (ବାକ୍ସଟି ଯାଚାଇ କରନ୍ତୁ)	Hill (ପାହାଡ଼ୀ)			Plain (ସମଭୂମି)		
5	Average Annual Rainfall (in mm)* ବାର୍ଷିକ ହାରୁ ବୃଷ୍ଟିପାତ (ମିଲିମିଟାରେ)						
6	Special Features of Land* (ଜମିର ବିଶେଷ ବୈଶିଷ୍ଟ୍ୟ)						
7	Distance from nearest Road (Approx. in m) ନିକଟତମ ରାସ୍ତା ଥେକେ ଦୂରତ୍ୱ (ମିଟରେ)						
8	Distance from main river/tributary with name (Approximate in m) ନାମର ସାଥେ ପ୍ରଧାନ ନଦୀ/ଉପନଦୀ ଥେକେ ଦୂରତ୍ୱ (ମିଟରେ)						
9	Suggested species for plantation based on past experience/native/ preferred ଅତୀତ ଅଭିଜ୍ଞତା/ନେଟିଭ/ ପସନ୍ଦର ଭିତ୍ତିରେ ଗଛ ଲଗାନୋର ଜନ୍ୟ ପ୍ରସ୍ତାବିତ ପ୍ରଜାତି	Trees (ଗଛ)		Herbs (ତୃଣ)		Shrubs (ଝୋପଝାଡ଼)	
10	Details of Fencing Work, if required before plantation ଗଛ ଲାଗାନୋର ଆଗେ ପ୍ରୟୋଜନ ହଲେ ବେଡ଼ା ଦେଓୟାର କାଜେର ବିବରଣ						
11	Details of SMC works, if required before plantation SMC କାଜେର ବିଶଦ ବିବରଣ, ଯଦି ଗଛ ଲାଗାନୋର ଆଗେ ପ୍ରୟୋଜନ ହୟ						
12	Area of plantation (in Hectare) ଗଛ ଲାଗାନୋର ଏଲାକା (ହେକ୍ଟରେ)	Year 01	Year 02	Year 03	Year 04	Year 05	
13	Planting Cost Including Nursery (Approx. in Lakhs) ନର୍ସାରି ସହ ରୋପଣ ଖରଚ (ଆନୁମାନିକ ଲାଖେ)	Year 01	Year 02	Year 03	Year 04	Year 05	
14	Maintenance Cost of plantation with years (Approx. in Lakhs) ବର୍ଷରେର ସାଥେ ଗଛ ଲାଗାନୋର ରକ୍ଷଣାବେକ୍ଷଣ ଖରଚ (ଆନୁମାନିକ ଲାଖେ)	Year 01	Year 02	Year 03	Year 04	Year 05	
15	Remarks if Any (ଯଦି ମନ୍ତବ୍ୟ ଥାକେ)						
16	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required) ସମସ୍ତ କୋଣେ ସାଇଟର ଜିପିଏସ ସ୍ଥାନାଙ୍କ (ସାଇଟର 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)** ଟ୍ରିଟମେଣ୍ଟ ସାଇଟ/ମାନଚିତ୍ରର ରଫ ସ୍କେଚ (ଏକଟି ସଂଯୁକ୍ତି ହିସାବେ)							
18.	**PLEASE ATTACH SOME CURRENT PHOTOGRAPHS IN THE MAIL ID dpr2.ifp@gmail.com** ଅନୁଗ୍ରହ କରେ କିଛୁ ବର୍ତମାନ ଫଟୋଗ୍ରାଫ ସଂଯୁକ୍ତ କରନ୍ତୁ ଏହି (dpr2.ifp@gmail.com) ମେଇଲ ଆଇଡିତେ							

*Not Mandatory (ବାଧ୍ୟତାମୂଳକ ନୟ)

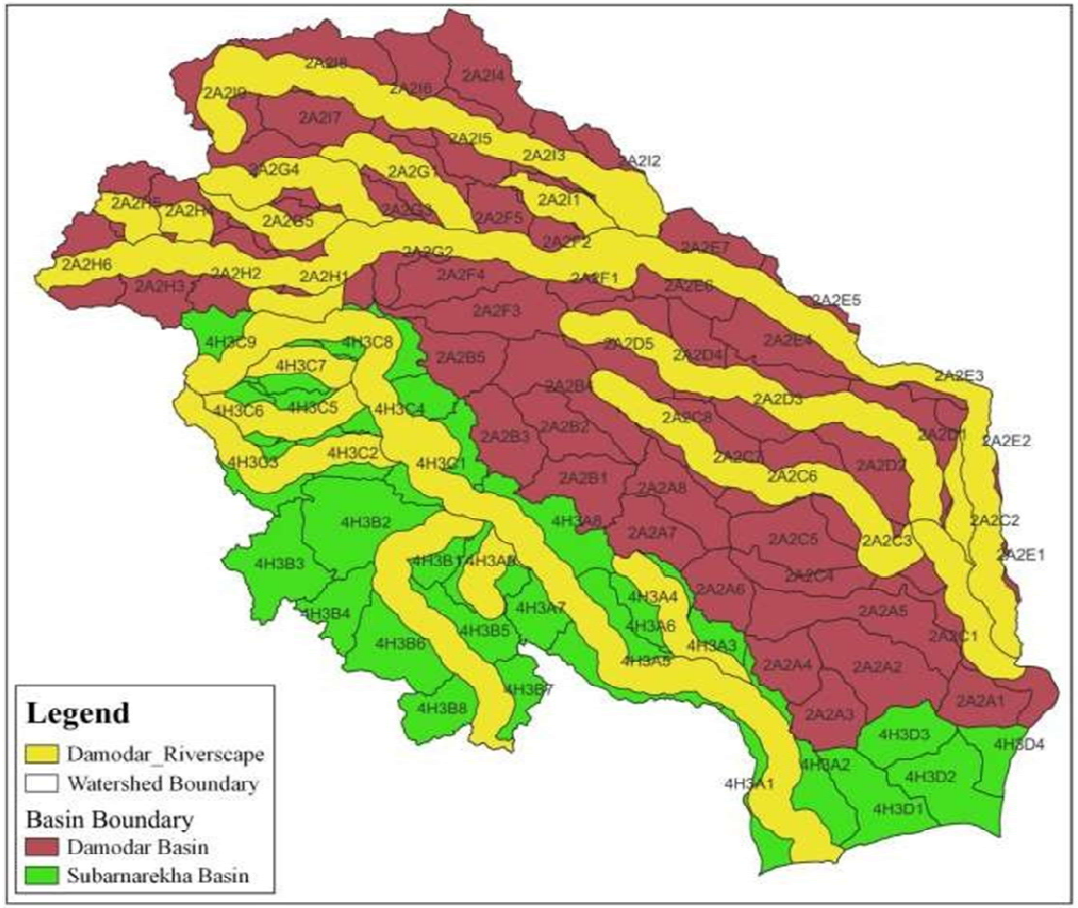
Annexure - II

Subarnrekha & Damodar Rivers and their major tributaries

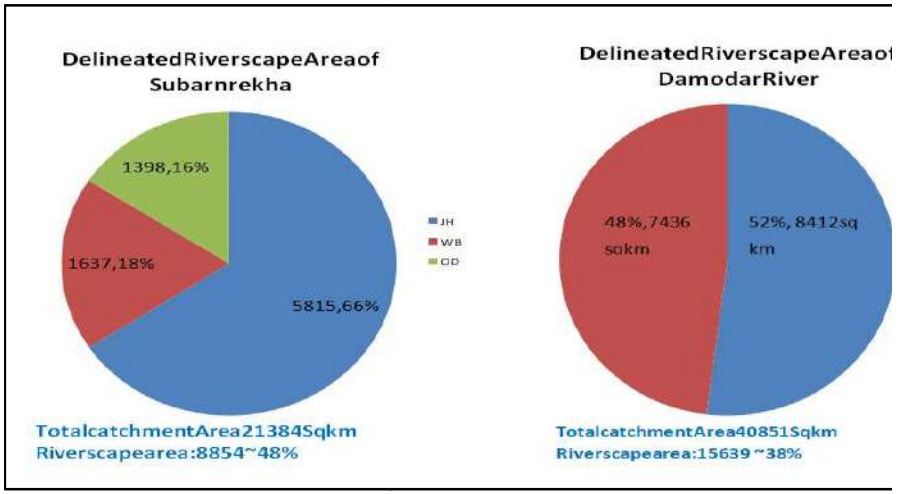


Tributaries of Damodar River
Garhi
Haharo
Bokaro
Konar
Jamuniya
Kudiya
Barakar
Bhera
Darkeswar
Silabati
Tributaries of Subarnrekha River
Raru
Kanchi
Kharkai
Karkari
Garra
Sankh
Jumar
Dulung

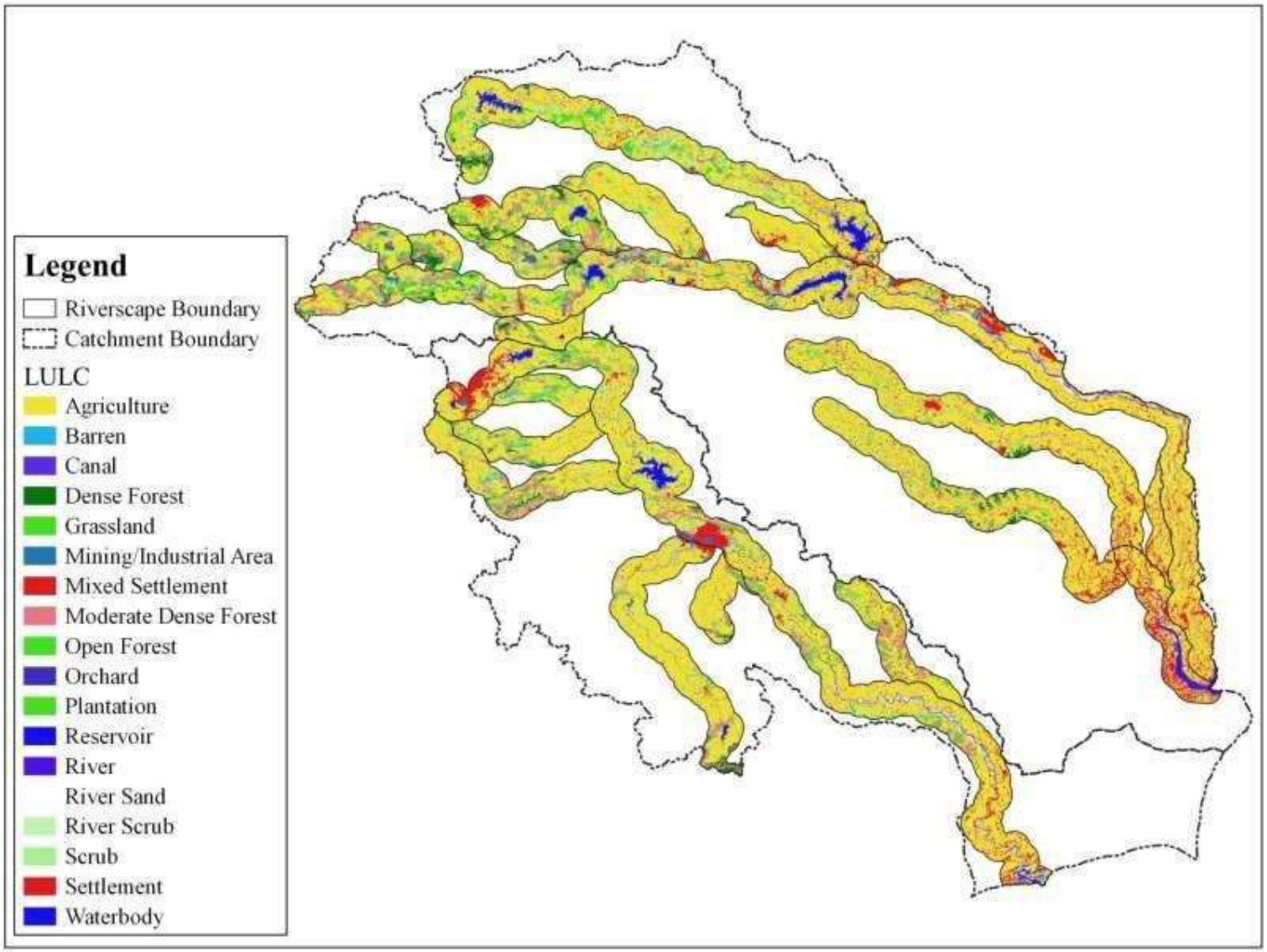
Riverscape Area Projected over Watershed Boundary



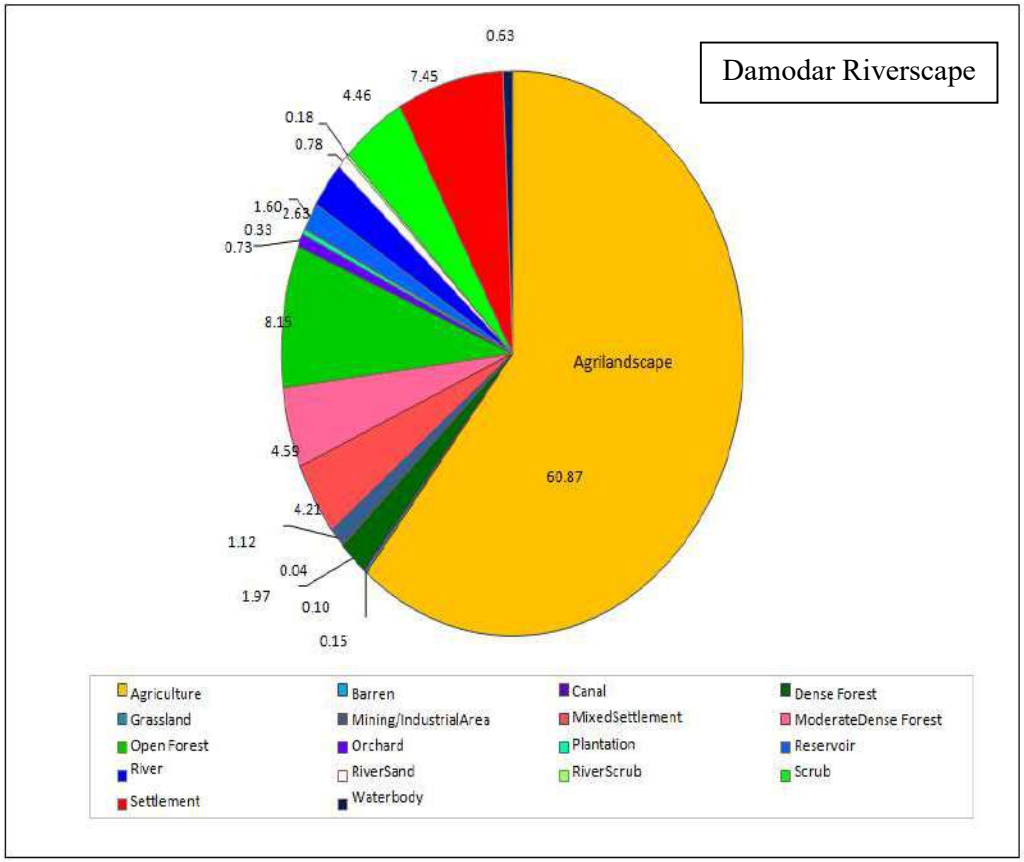
Riverscape Area @5km Buffer

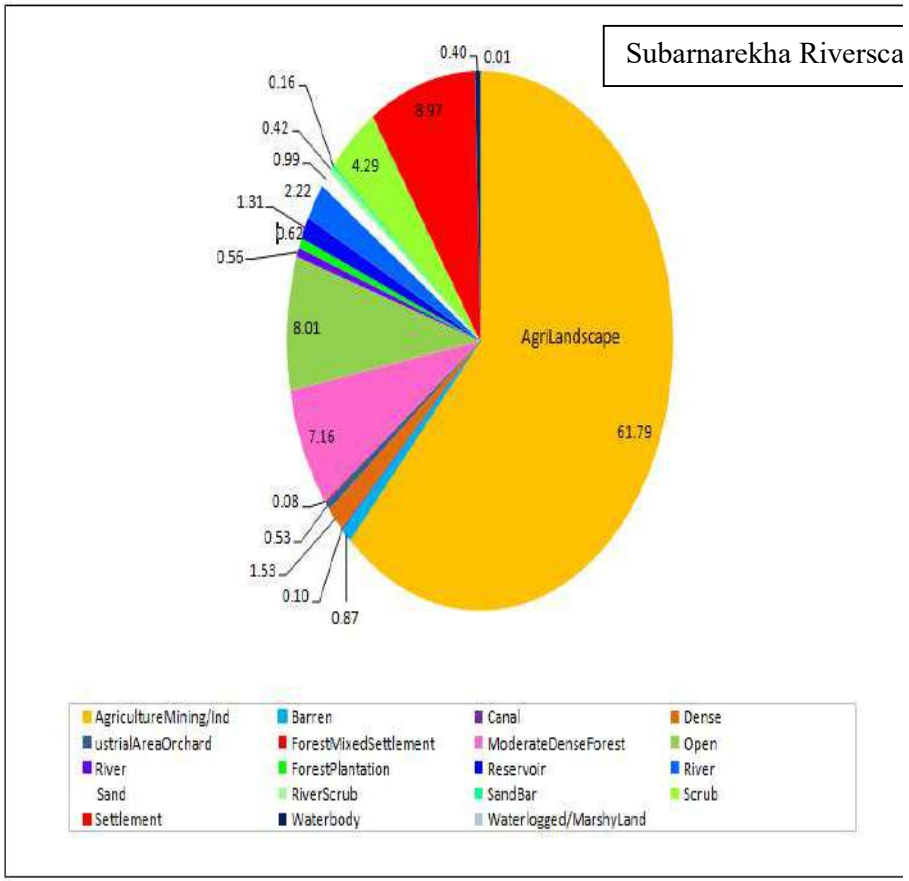


LULC Map of the Riverscape

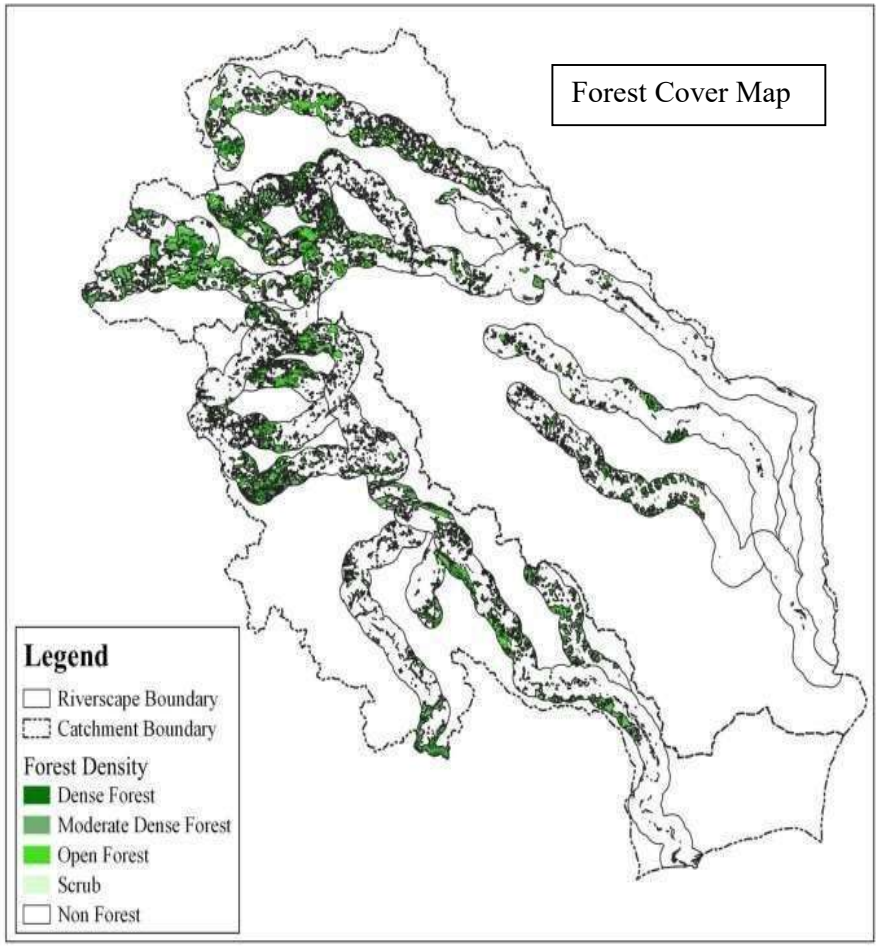


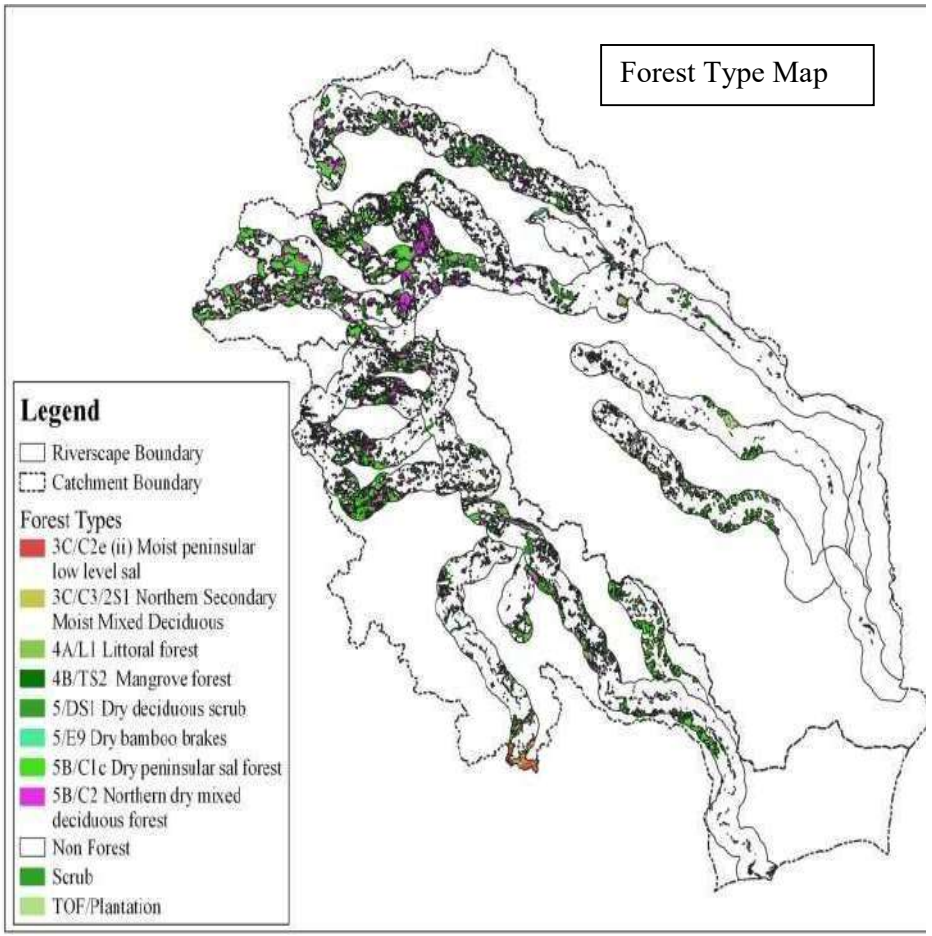
LULC Stats for the Damodar & Subarnarekha Riverscape (in%)





Forest Cover & Forest Type Map of the Riverscape

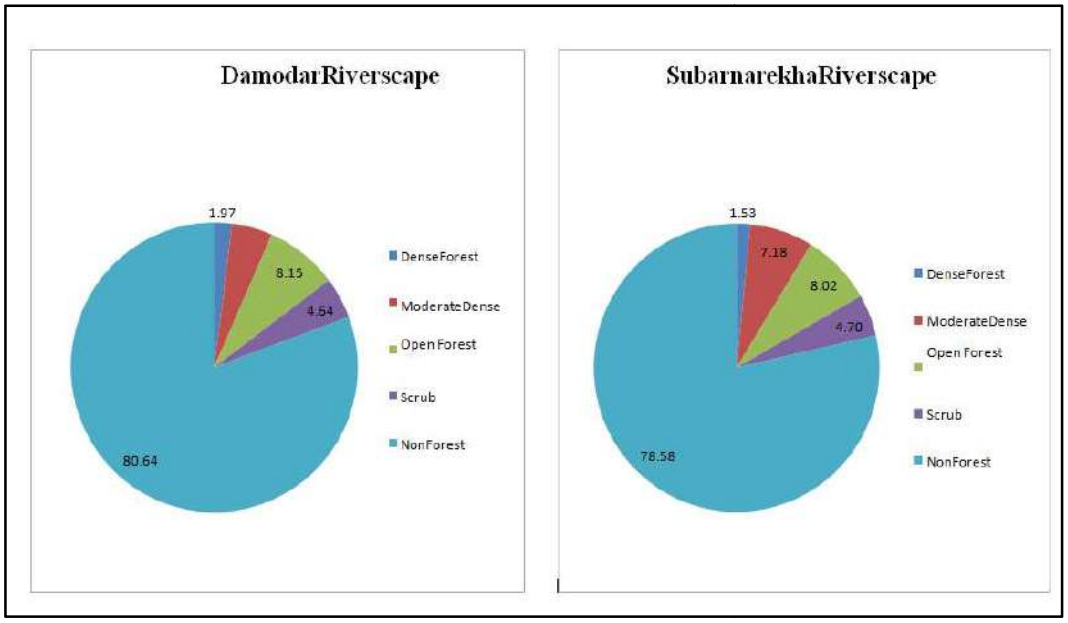




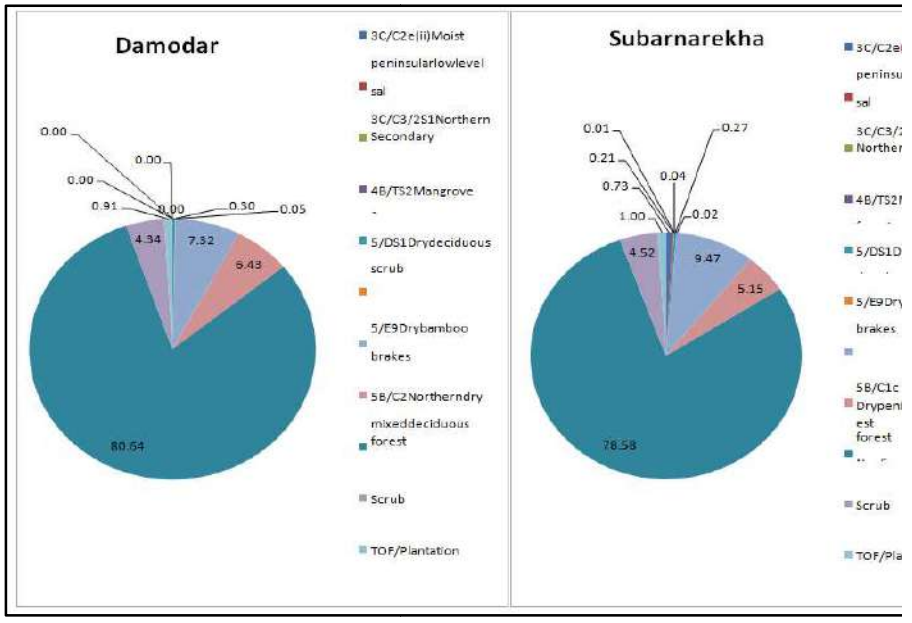
Source: FSI, 1

Forest Cover/Type area wise Riverscape profile (in%)

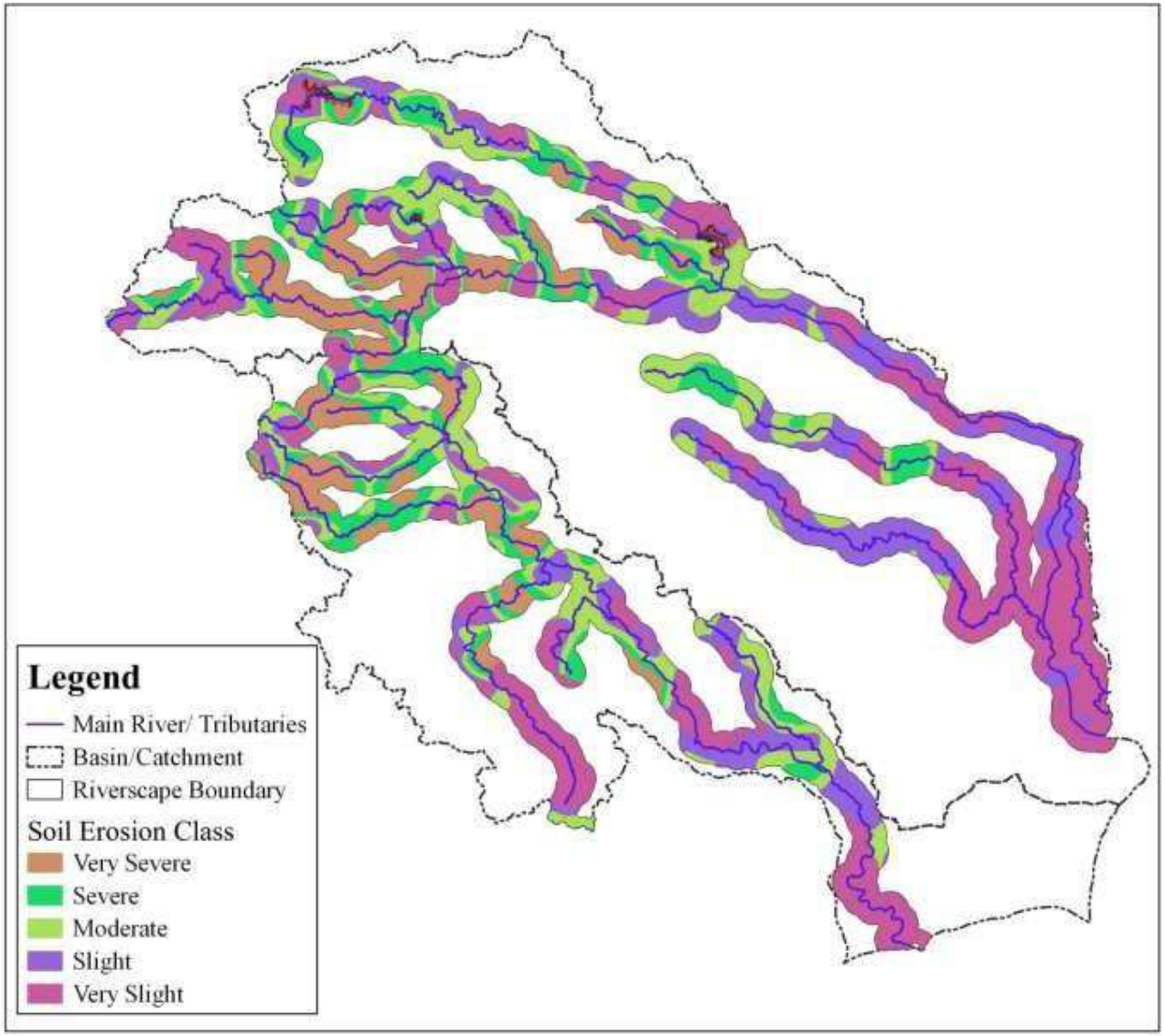
Forest Cover Area Details



Forest Type Area Details

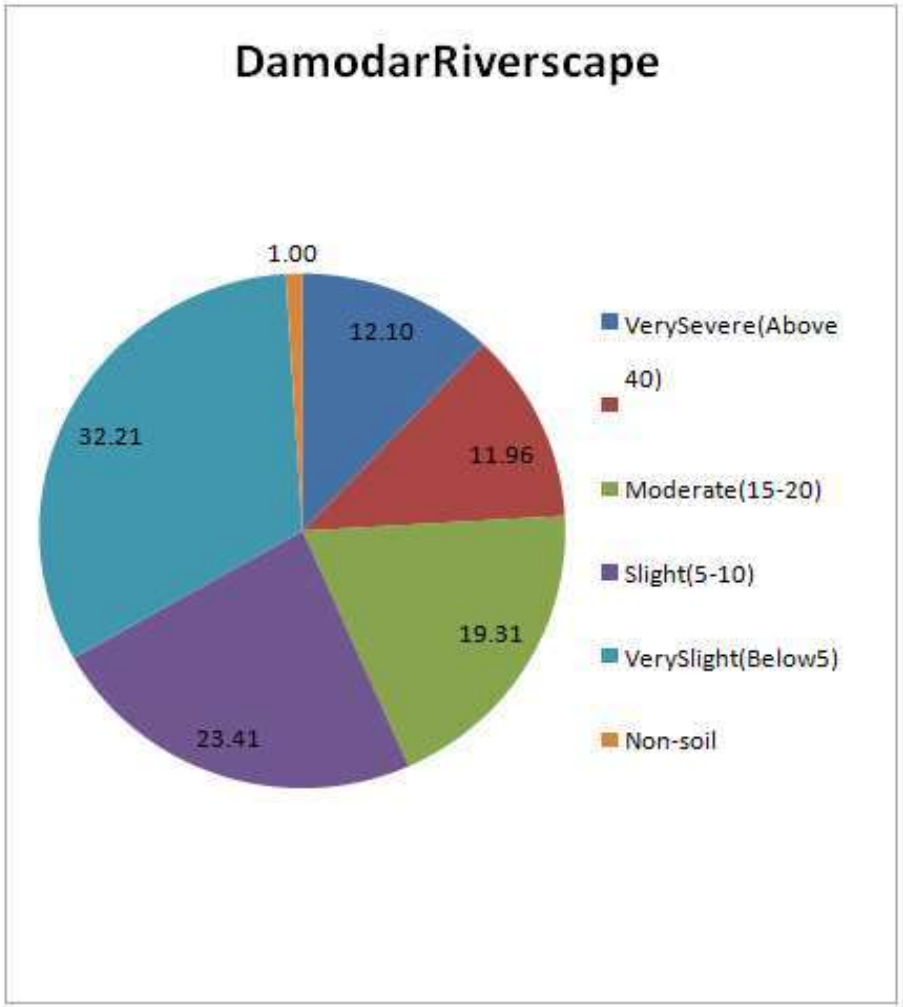


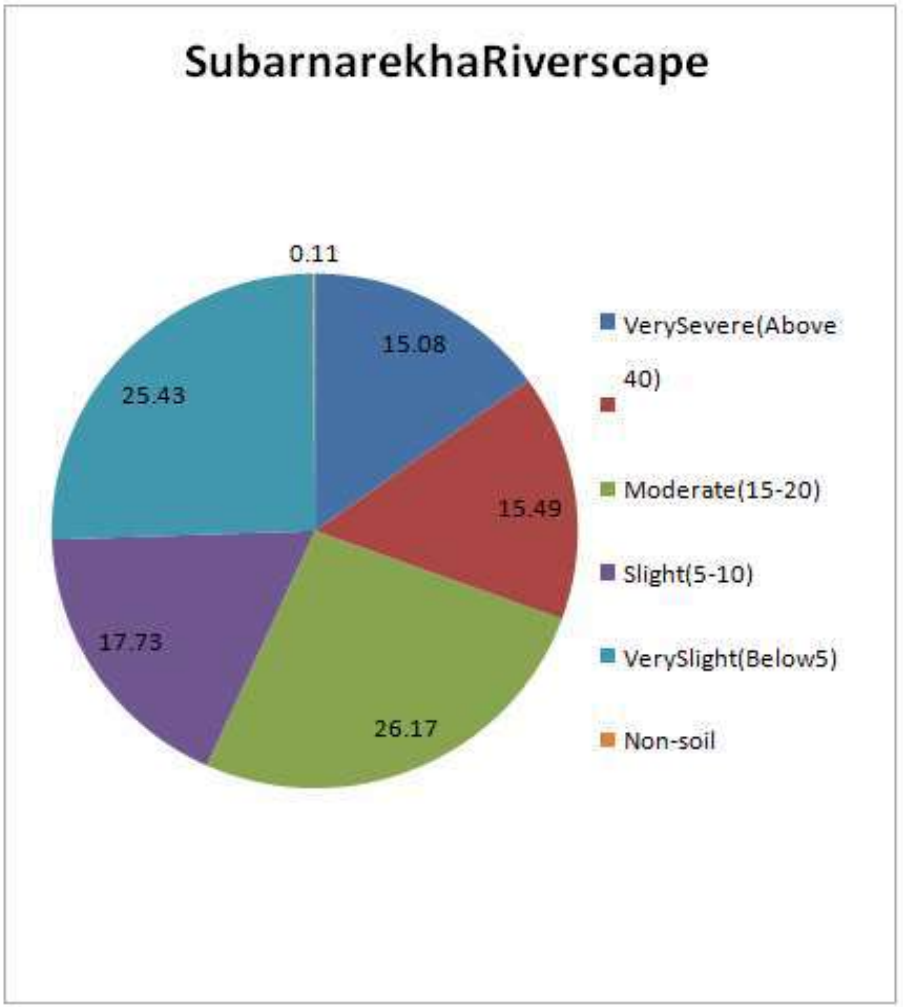
Soil erosion profile of the Riverscape



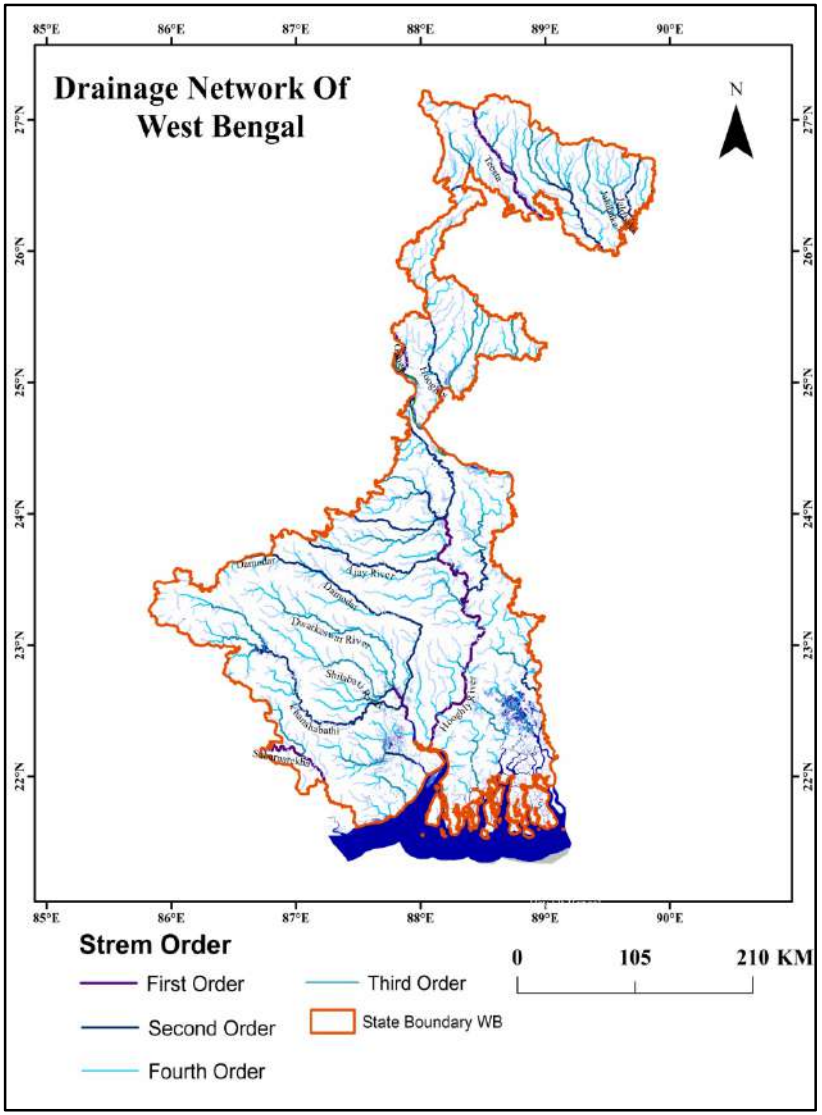
Source: IISWC, Dehradun

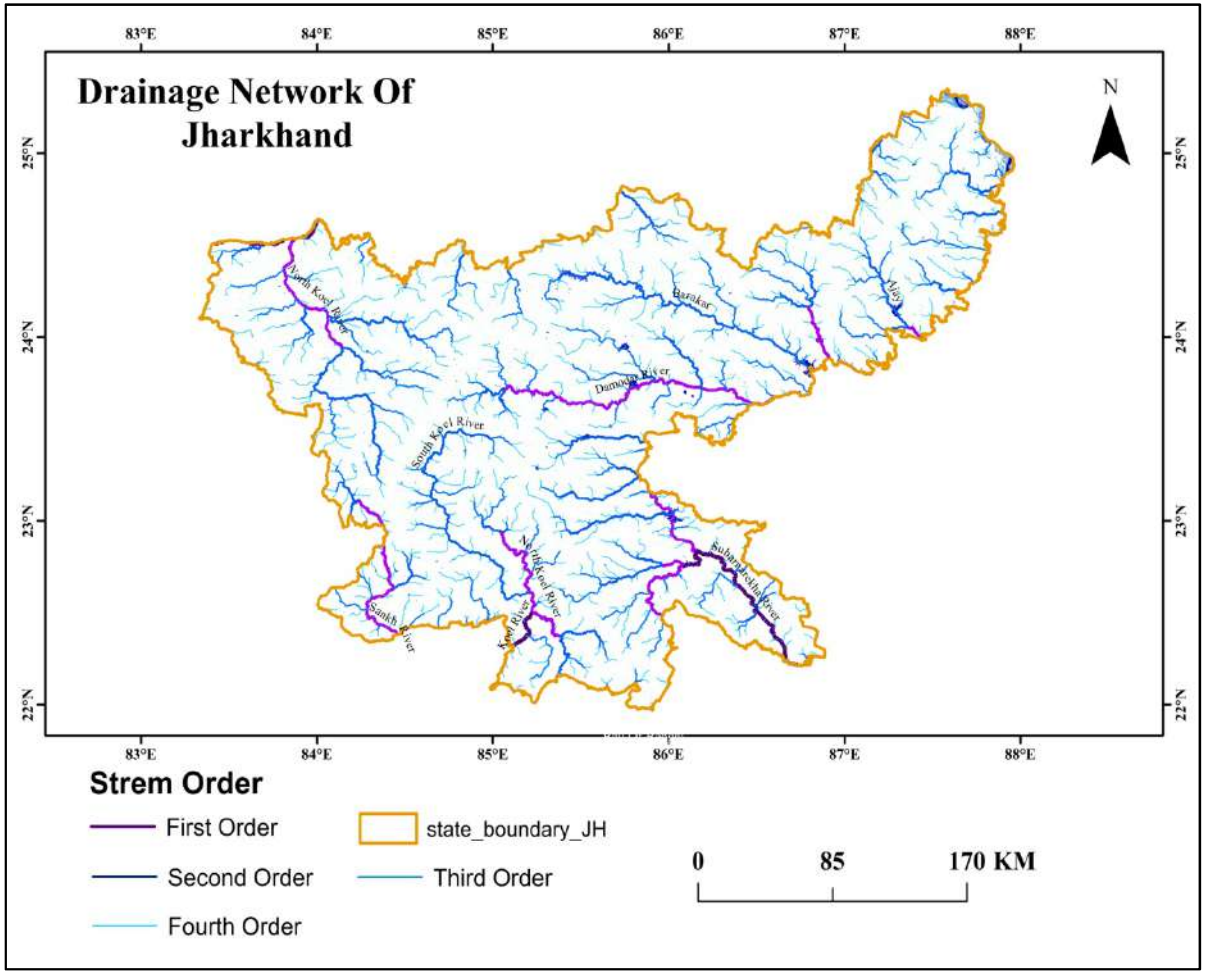
Soil Erosion Area Stats of Riverscape(in%)



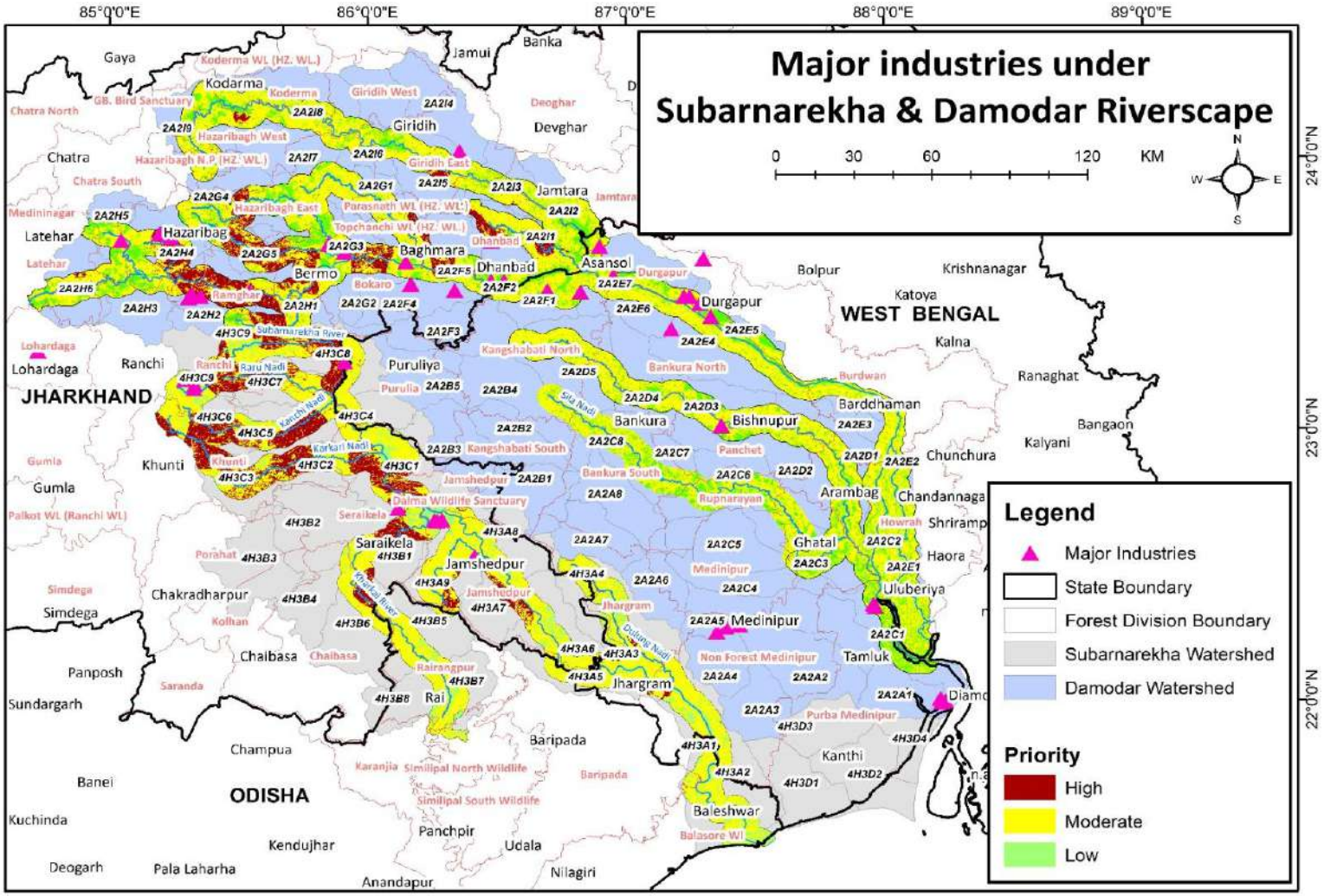


Drainage Network Map of Jharkhand and West Bengal

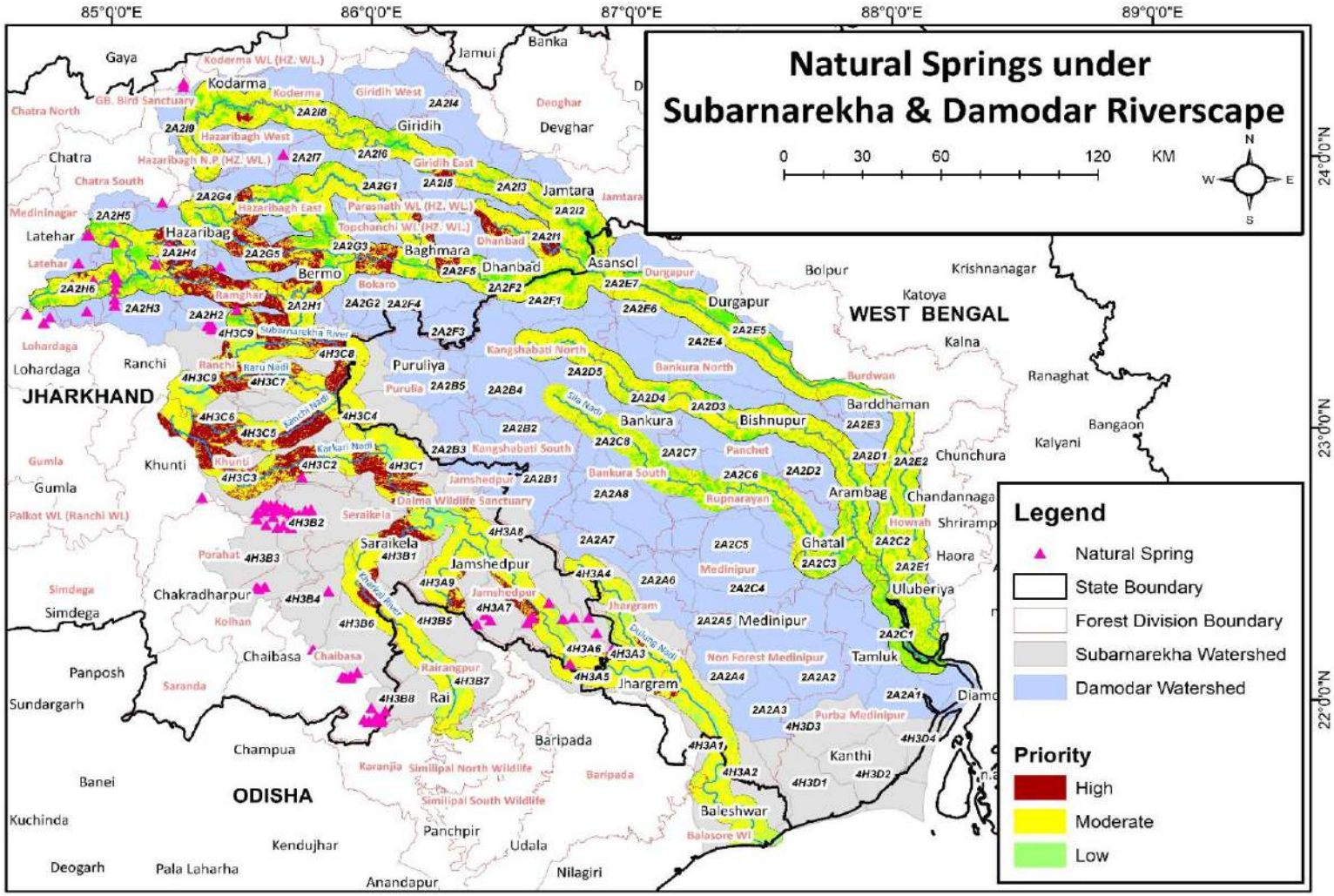




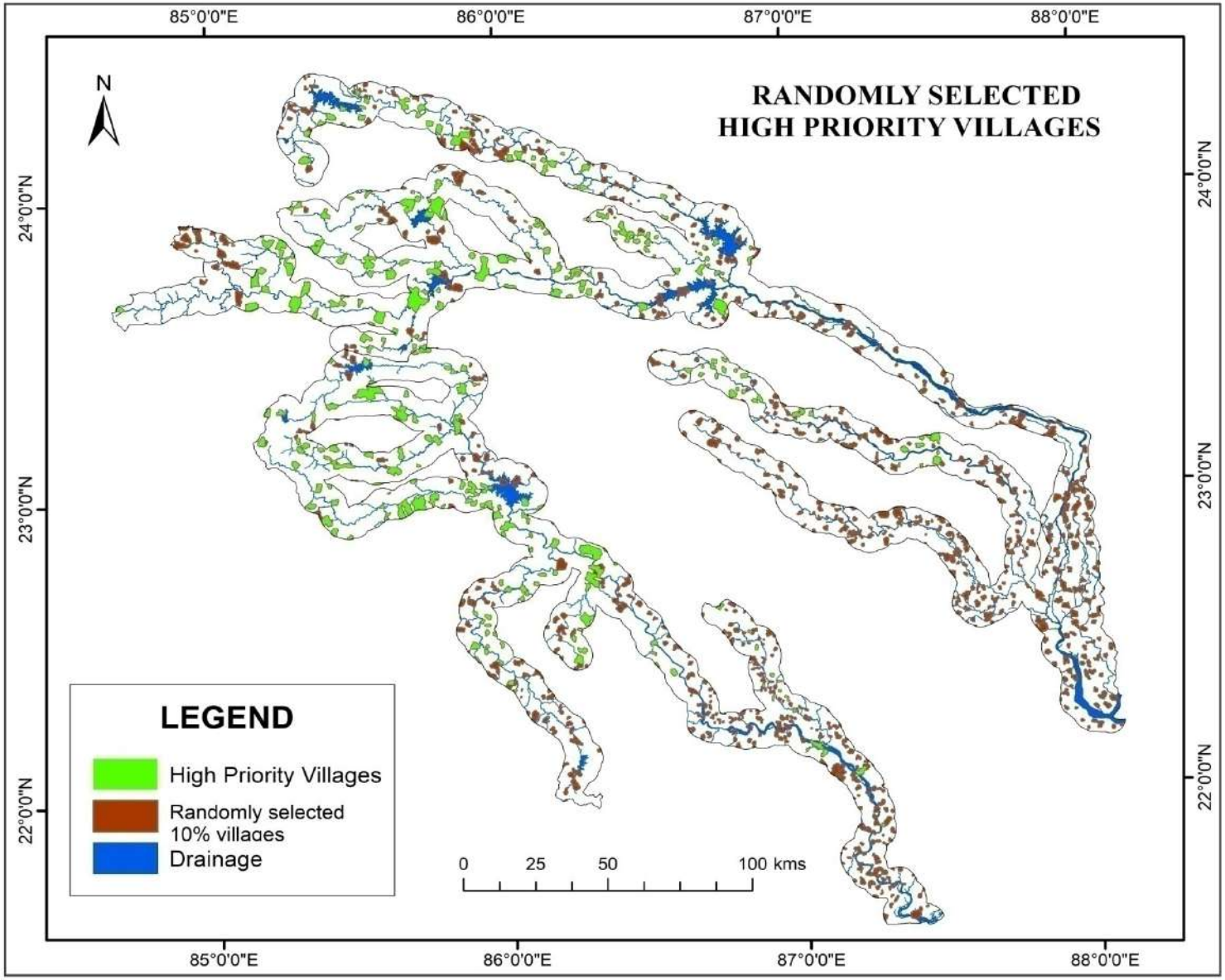
Map showing the locations of major industires within the Riverscape Area



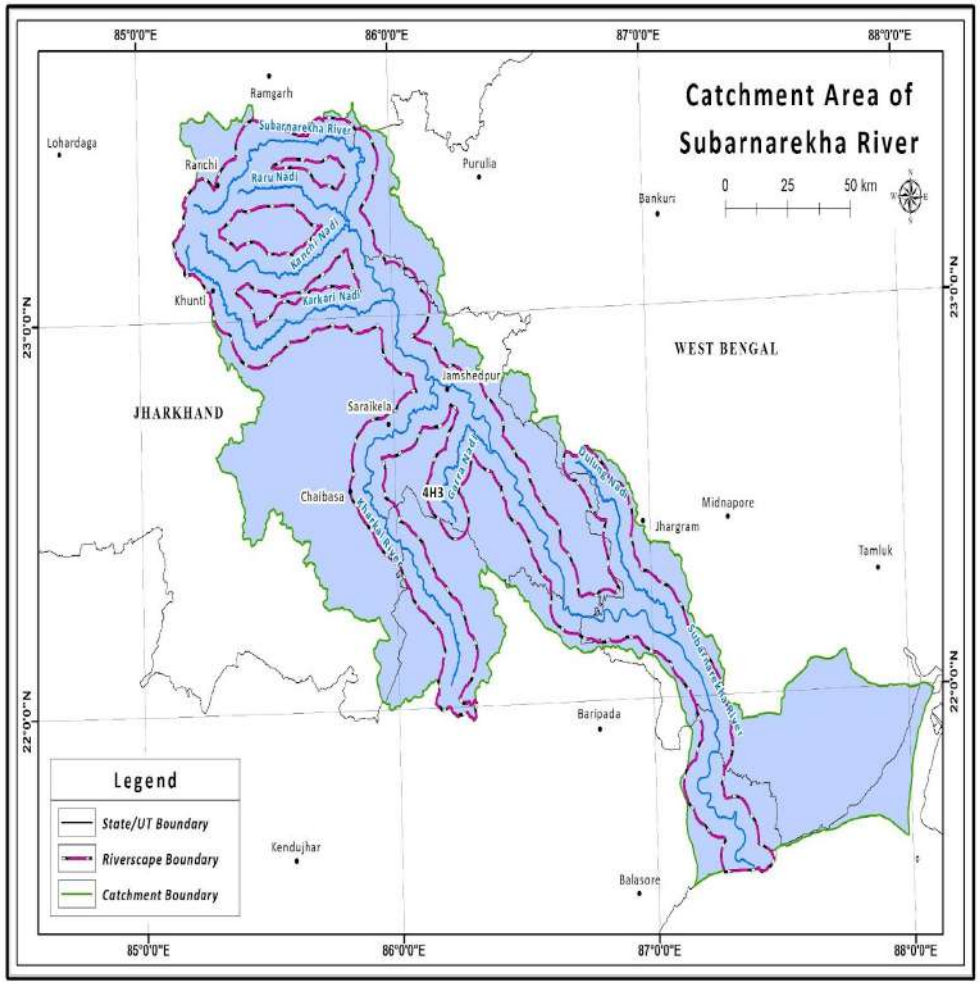
Map showing the distribution of Natural Spring Sources

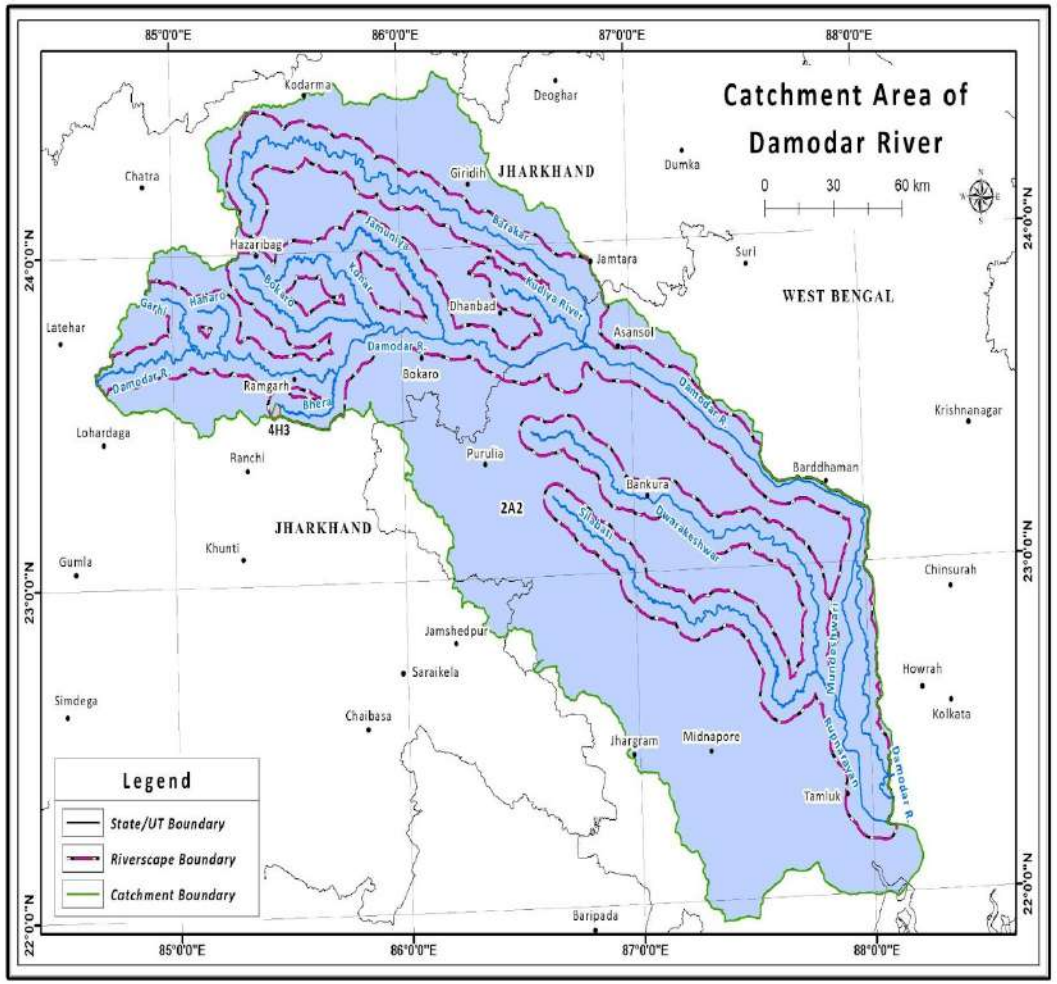


Validated locations for the surveyed villages within Riverscape

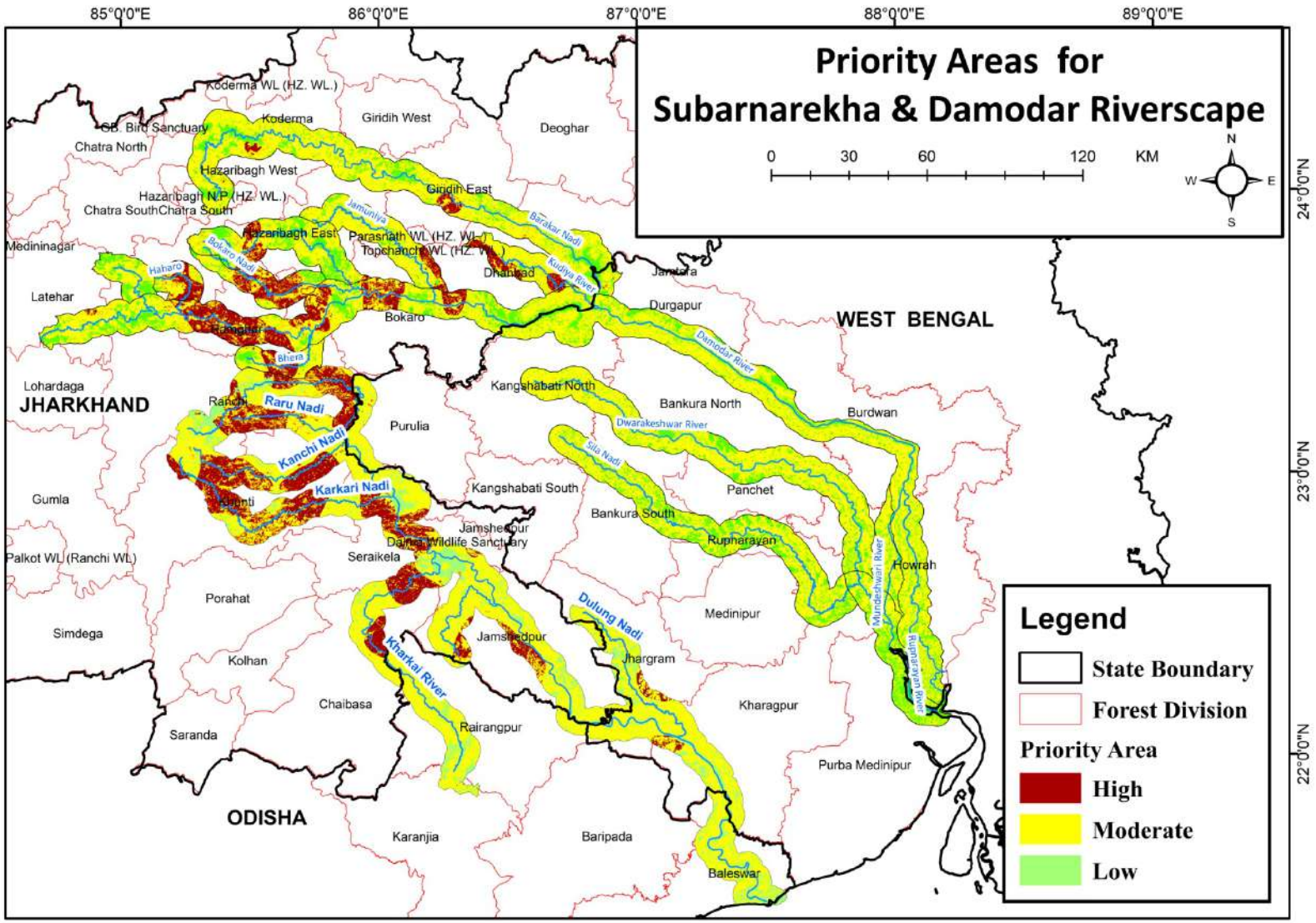


Catchment area Map for the Riverscape Area

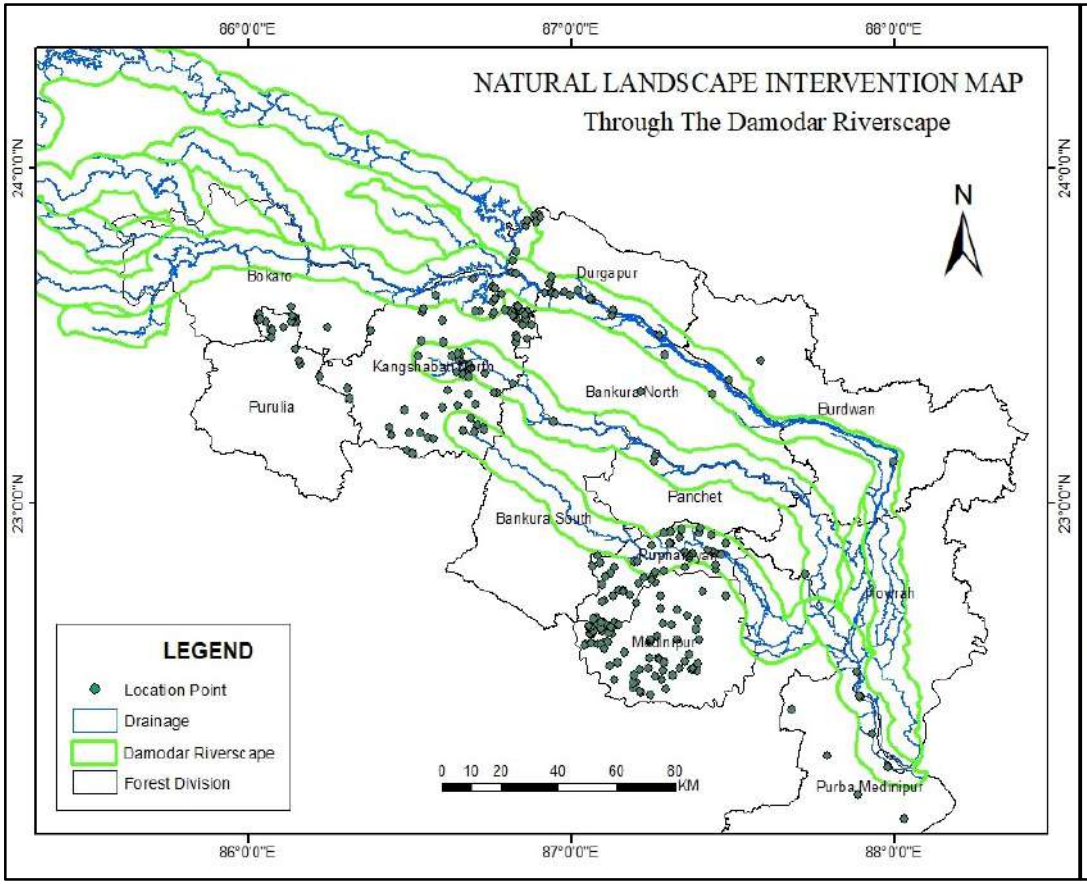


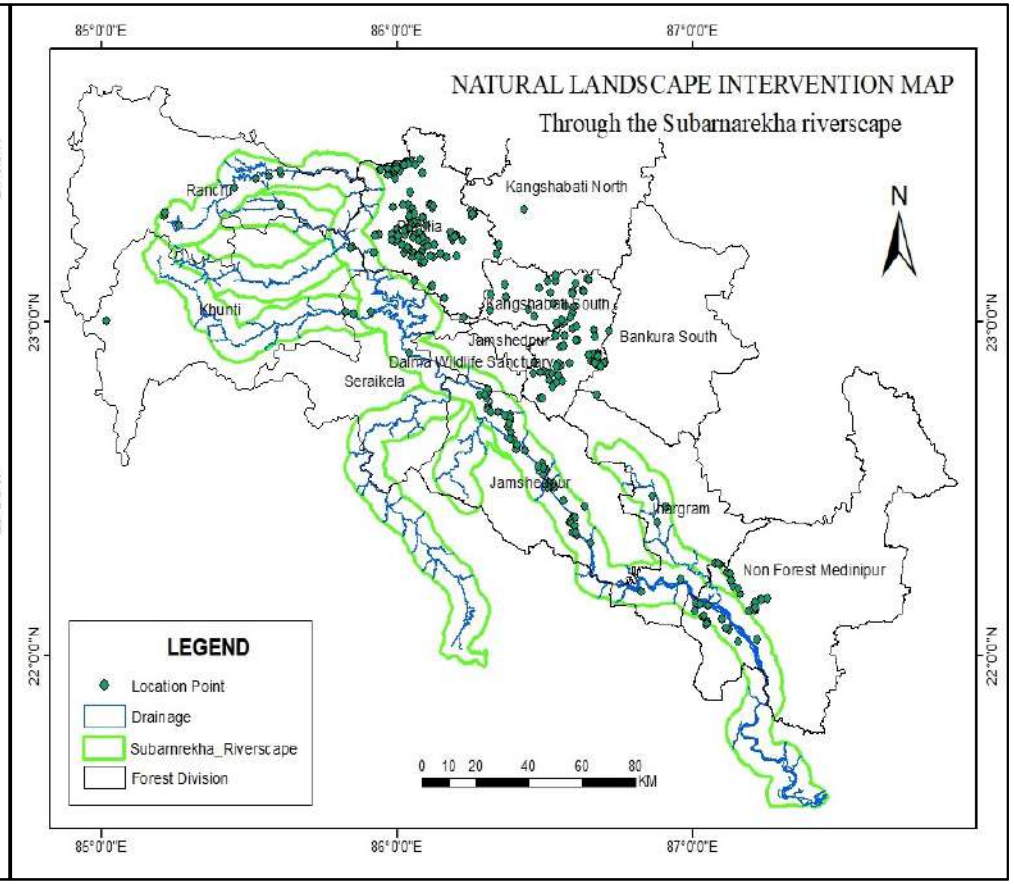


Priority area map of the Riverscape

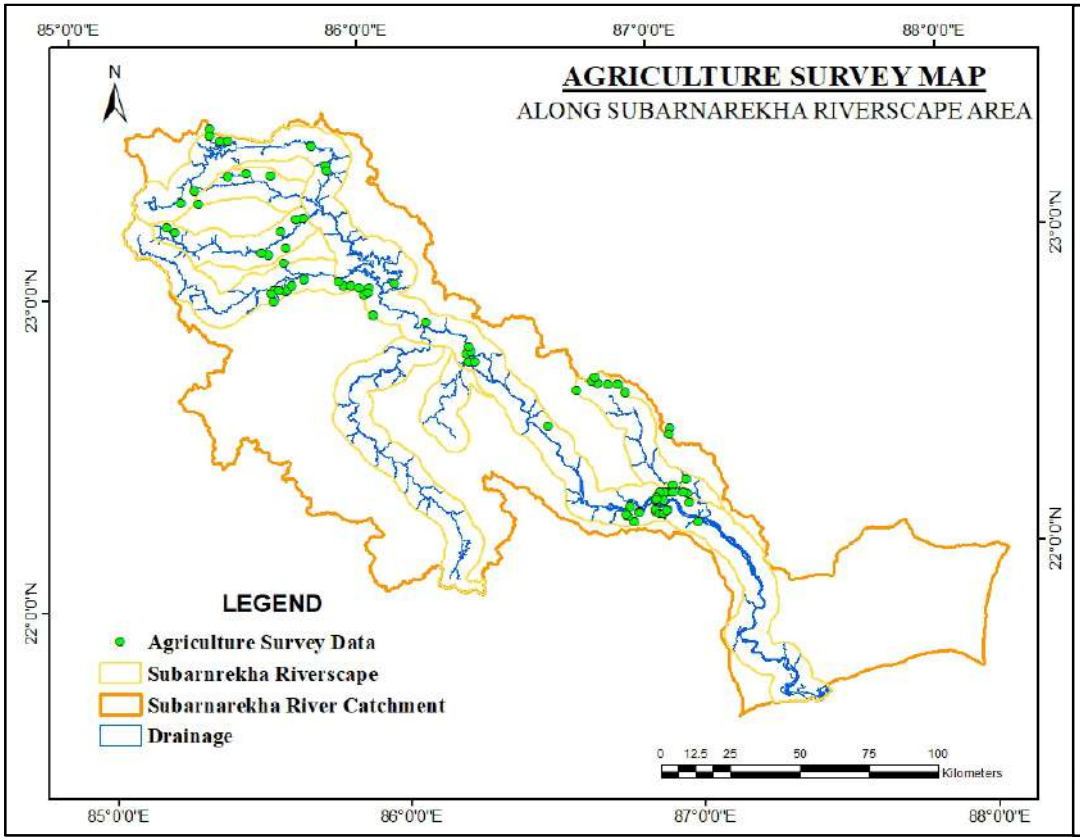


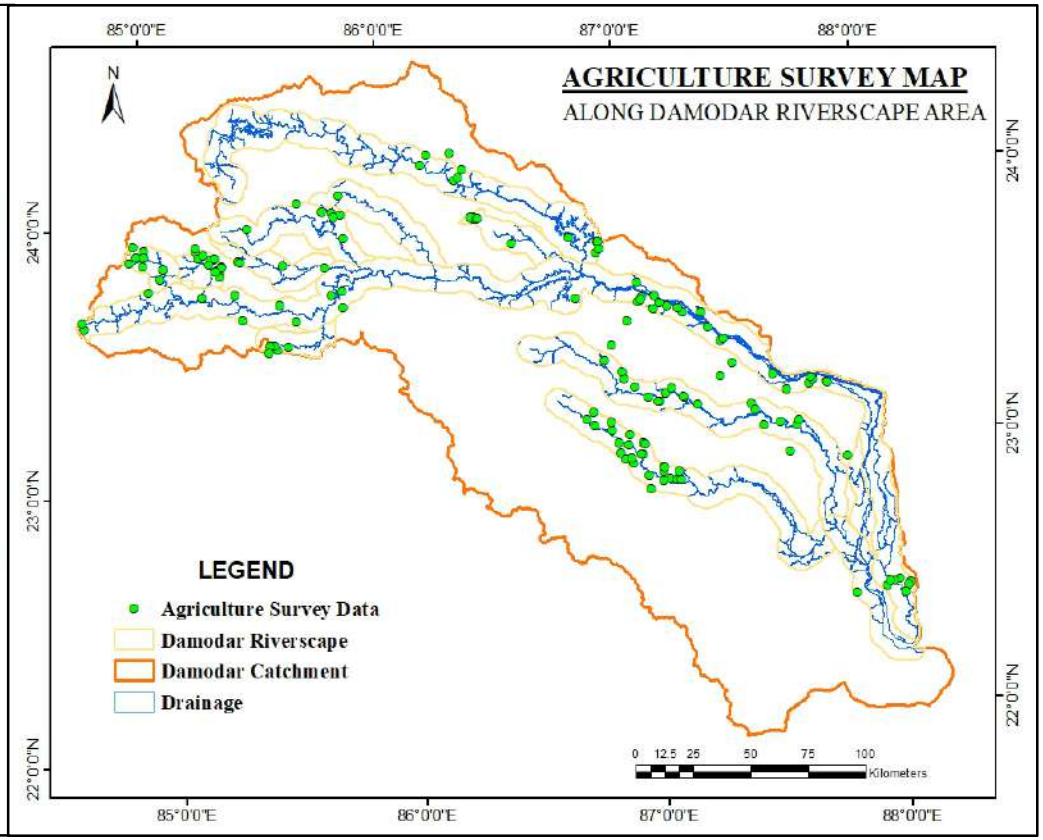
Location map for the proposed intervention sites under Natural Landsacpe



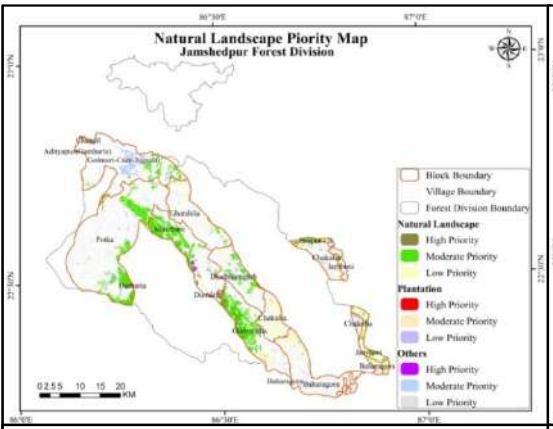


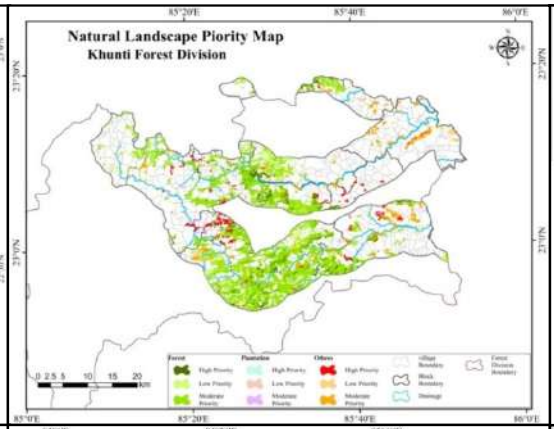
Location map for the proposed intervention sites under Agriculture Landscape

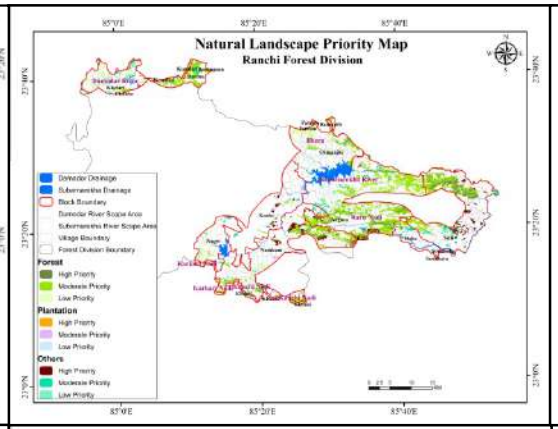


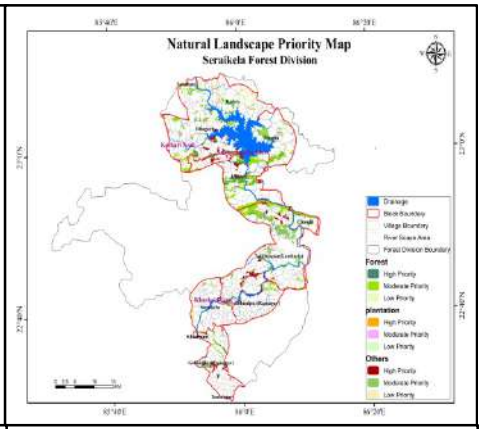


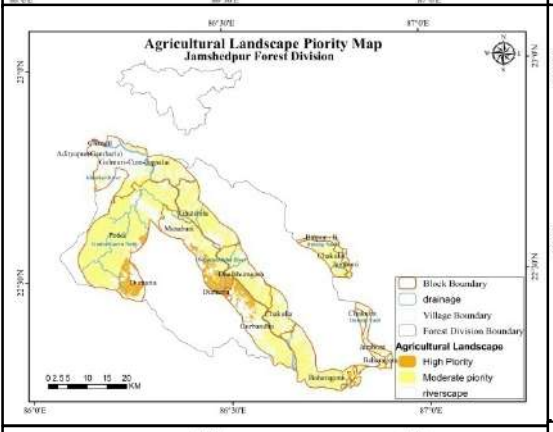
Forest division wise area profile within the Subarnarekha Riverscape for Jharkhand

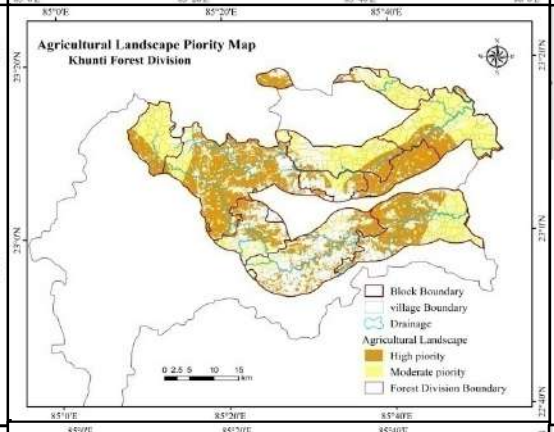


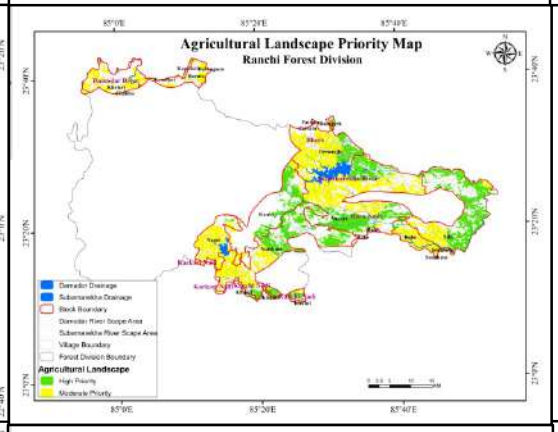


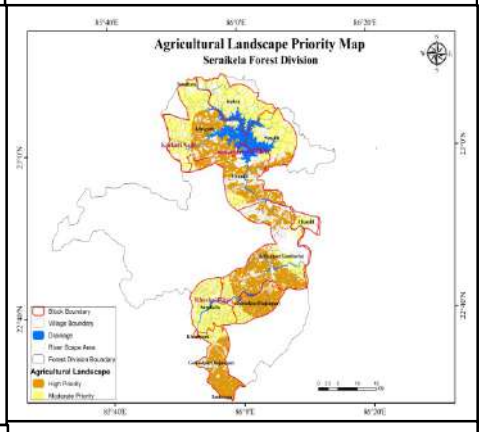


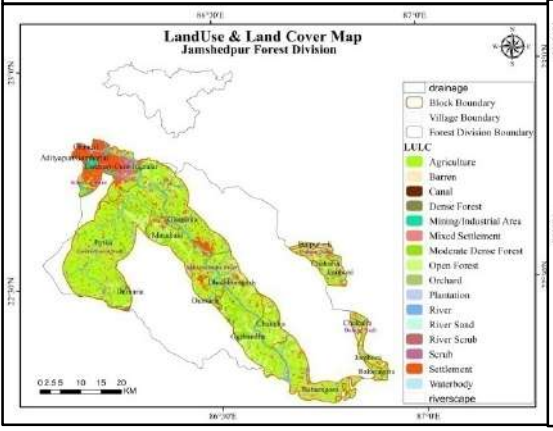


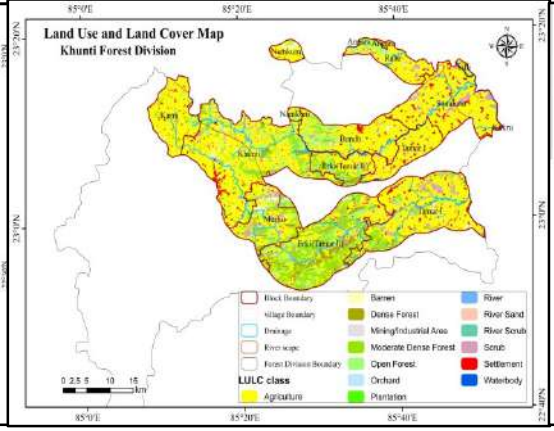


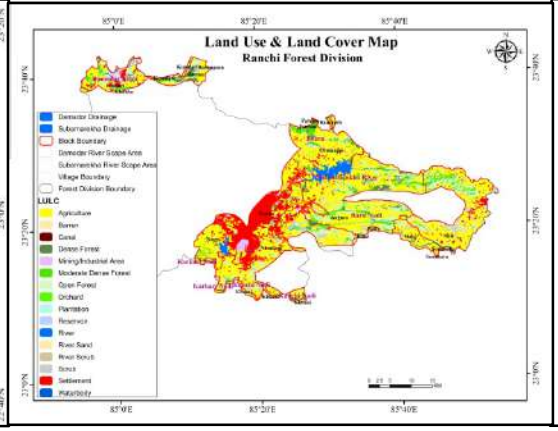


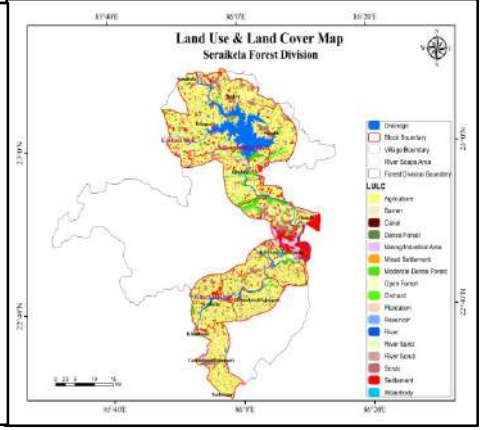


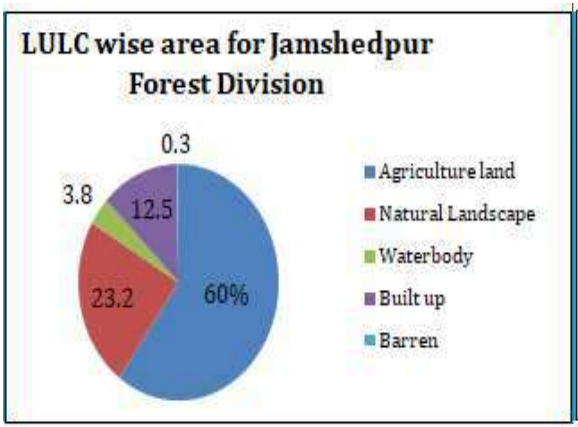


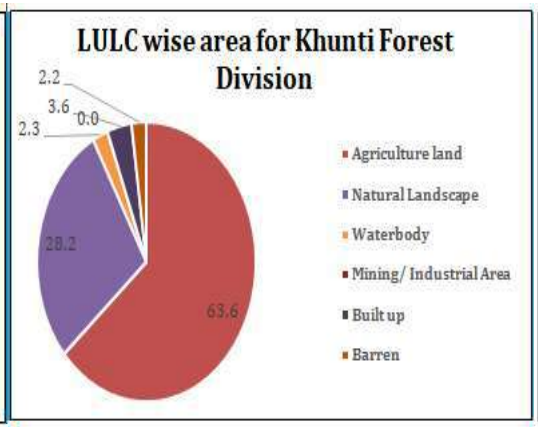


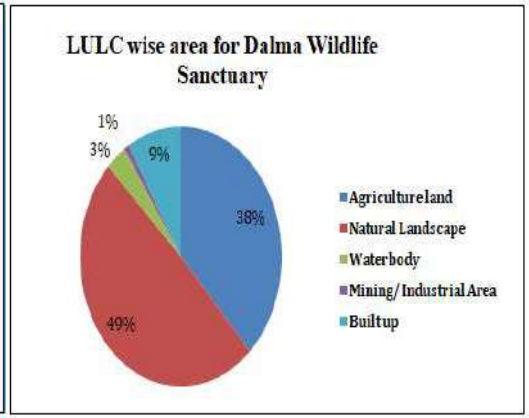


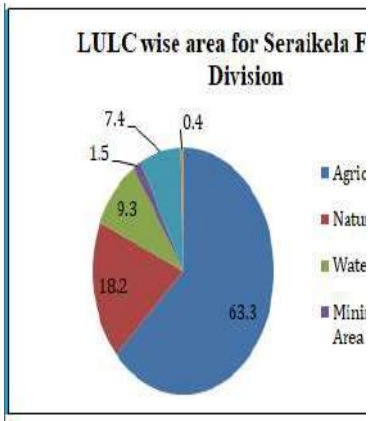


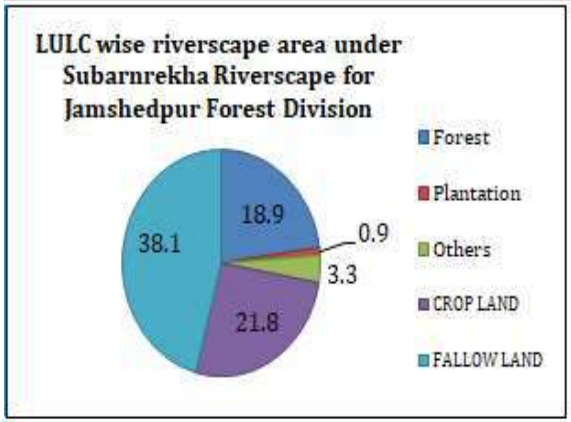


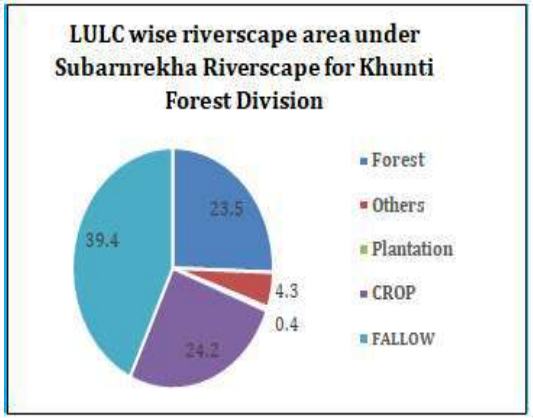

LULC wise area for Jamshedpur Forest Division
0.3
3.8
12.5
23.2
60%
Agriculture land
Natural Landscape
Waterbody
Built up
Barren

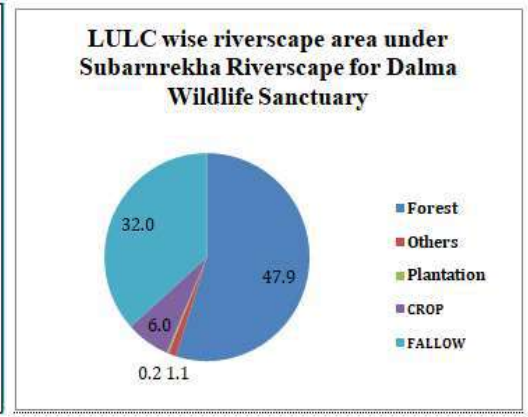

LULC wise area for Khunti Forest Division
2.2
3.6
0.0
2.3
28.2
63.6
Agriculture land
Natural Landscape
Waterbody
Mining/ Industrial Area
Built up
Barren

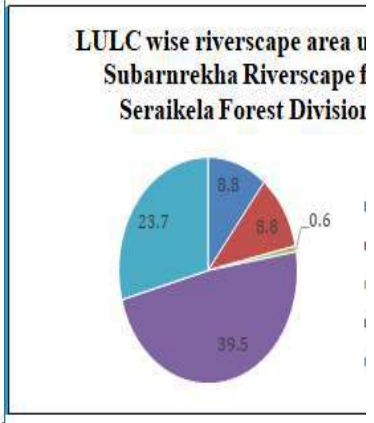

LULC wise area for Dalma Wildlife Sanctuary
1%
3%
9%
38%
49%
Agriculture land
Natural Landscape
Waterbody
Mining/ Industrial Area
Built up

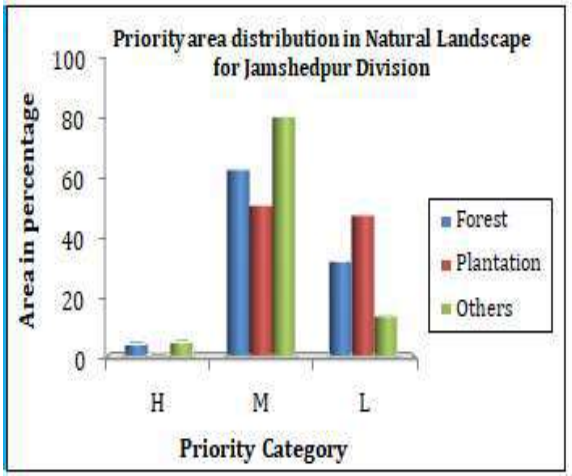

LULC wise area for Seraikela F Division
7.4
0.4
1.5
9.3
18.2
63.3
Agric
Natu
Wate
Mini
Area

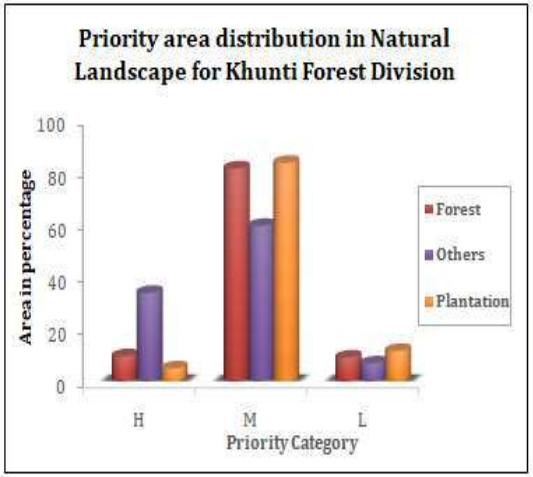

LULC wise riverscape area under Subarnrekha Riverscape for Jamshedpur Forest Division
18.9
0.9
38.1
3.3
21.8
Forest
Plantation
Others
CROP LAND
FALLOW LAND

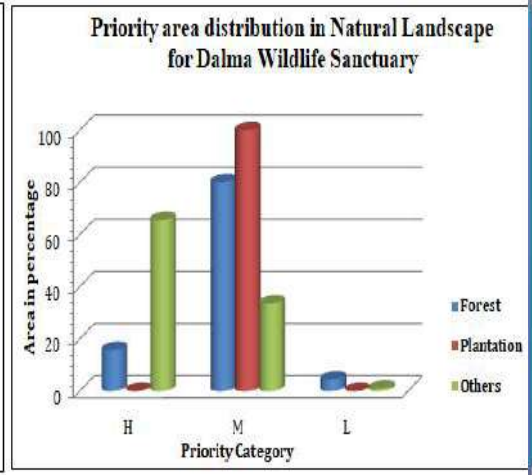

LULC wise riverscape area under Subarnrekha Riverscape for Khunti Forest Division
23.5
39.4
4.3
0.4
24.2
Forest
Others
Plantation
CROP
FALLOW

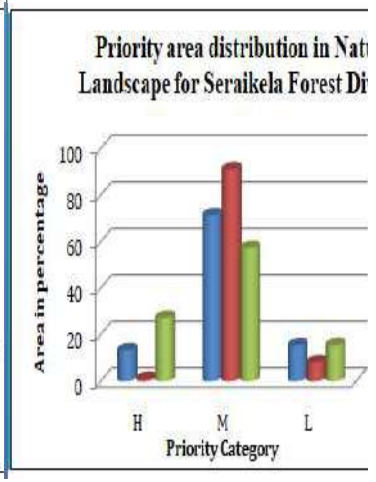

LULC wise riverscape area under Subarnrekha Riverscape for Dalma Wildlife Sanctuary
32.0
47.9
6.0
0.2 1.1
Forest
Others
Plantation
CROP
FALLOW


LULC wise riverscape area u Subarnrekha Riverscape f Seraikela Forest Divisio
8.8
23.7
8.8
0.6
39.5

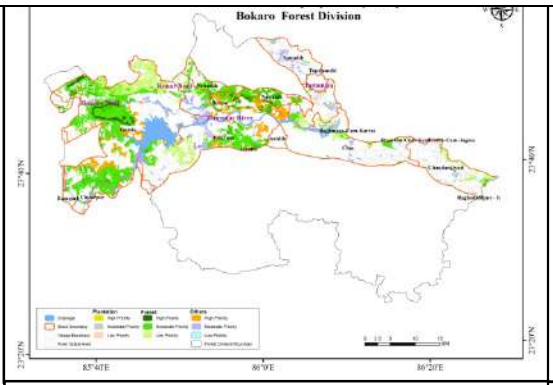

Priority area distribution in Natural Landscape for Jamshedpur Division
Area in percentage
100
80
60
40
20
0
H
M
L
Priority Category
Forest
Plantation
Others

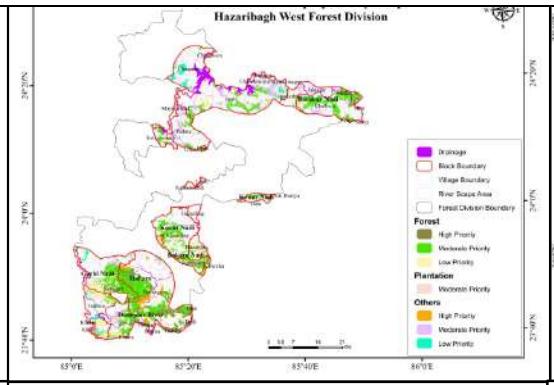

Priority area distribution in Natural Landscape for Khunti Forest Division
Area in percentage
100
80
60
40
20
0
H
M
L
Priority Category
Forest
Others
Plantation

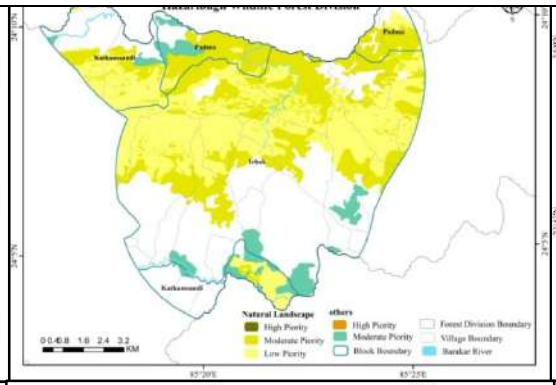

Priority area distribution in Natural Landscape for Dalma Wildlife Sanctuary
Area in percentage
100
80
60
40
20
0
H
M
L
Priority Category
Forest
Plantation
Others

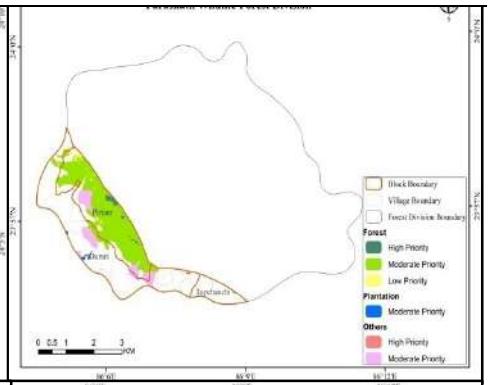

Priority area distribution in Nat Landscape for Seraikela Forest Di
Area in percentage
100
80
60
40
20
0
H
M
L
Priority Category

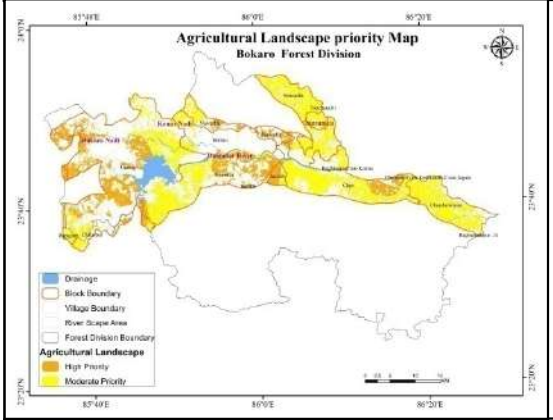
Forest Division wise area profile within the Damodar Riverscape for Jharkhand

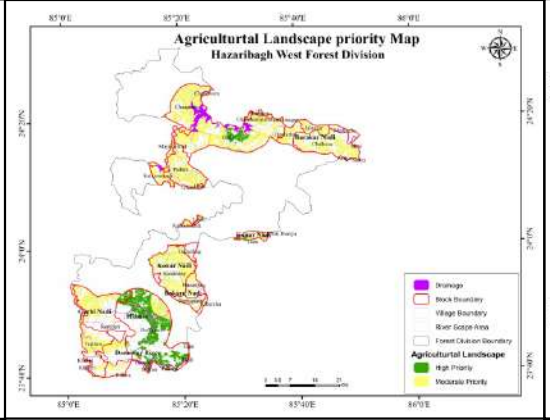


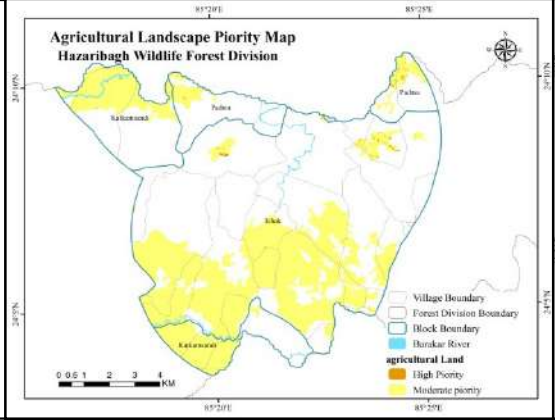


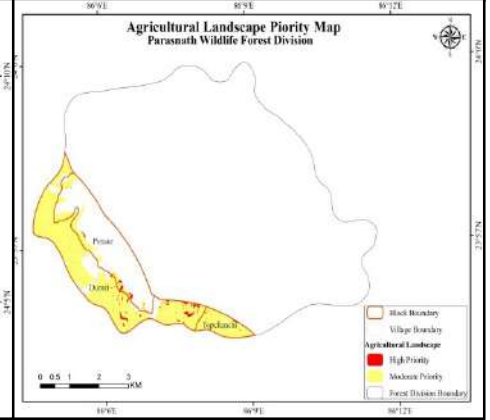


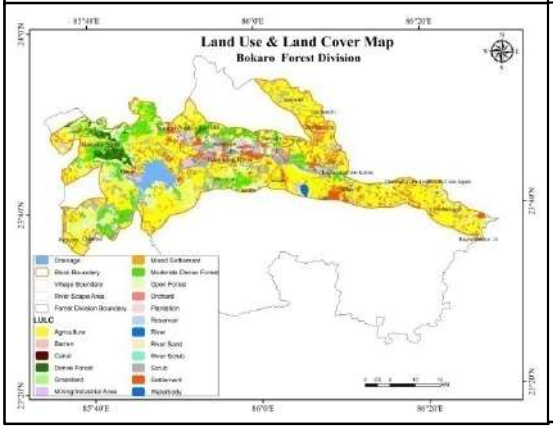


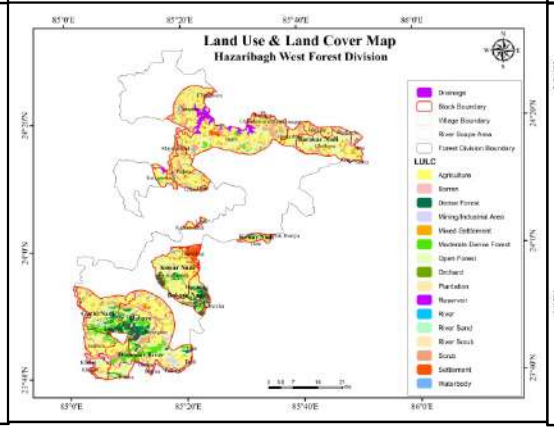


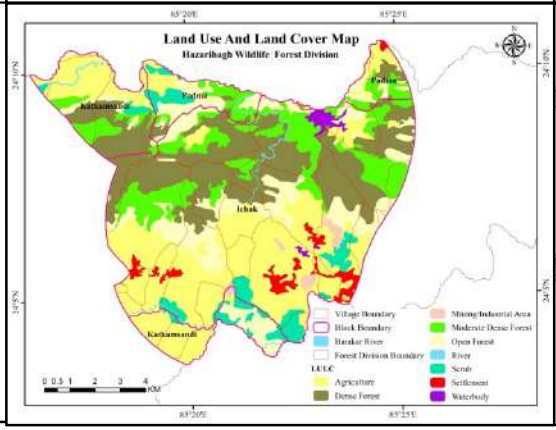


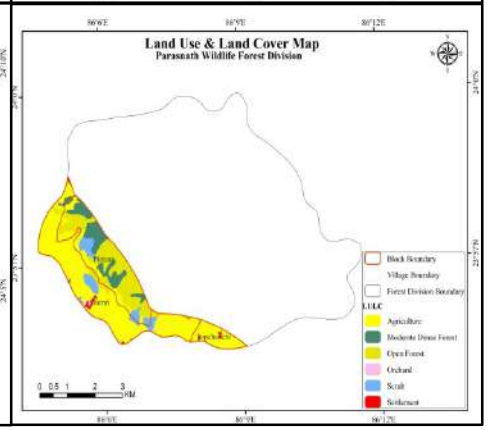




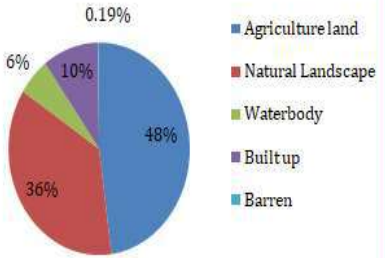




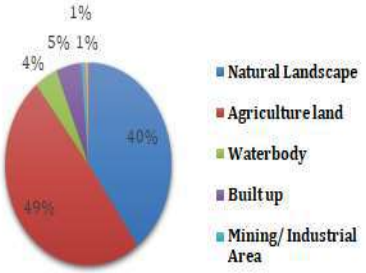




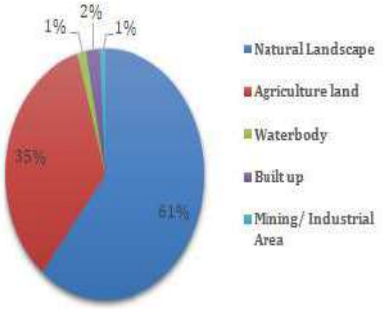
LULC wise area under Damodar for Bakaro Forest Division



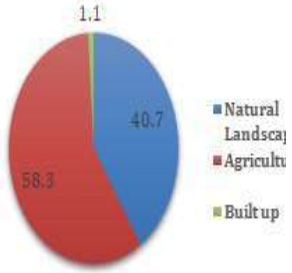
LULC wise area under Damodar for Hazaribagh West forest Division



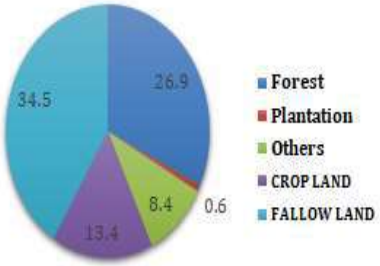
LULC wise area under Damodar for Hazaribagh Wildlife forest Division



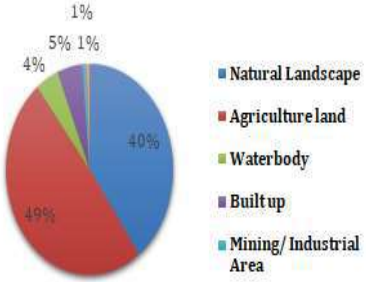
LULC wise area under Damod Parasnath Forest Division



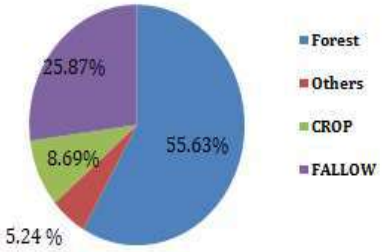
LULC wise riverscape area under Damodar for Bokaro Forest Division



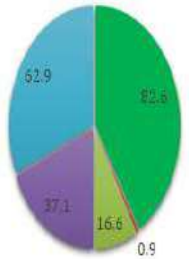
LULC wise area under Damodar for Hazaribagh West forest Division



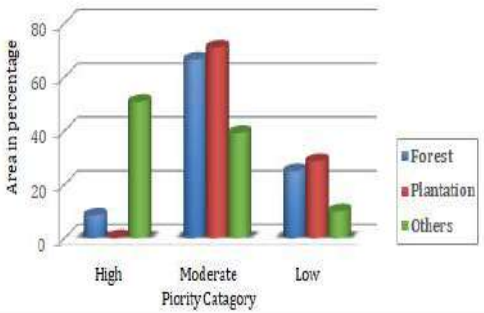
LULC wise riverscape area under Damodar for Hazaribagh W.L Forest Division



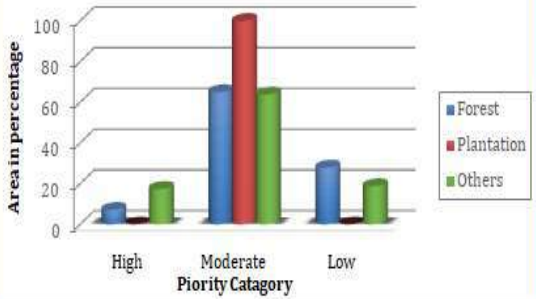
LULC wise Riverscape area under Da Parasnath Forest division



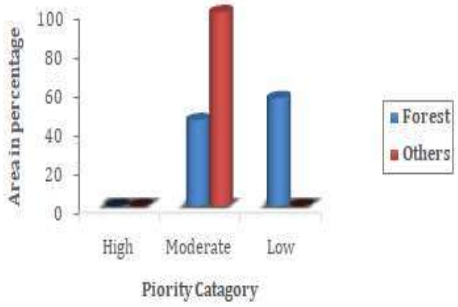
Piority area distrubution in Natural Landscape for Bokaro Forest Division



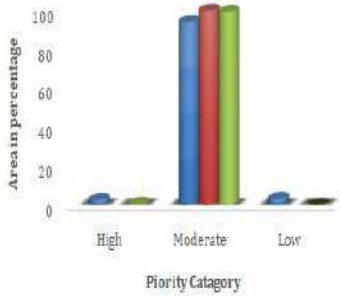
Piority area distrubution in Natural Landscape for Hazaribagh West forest Division



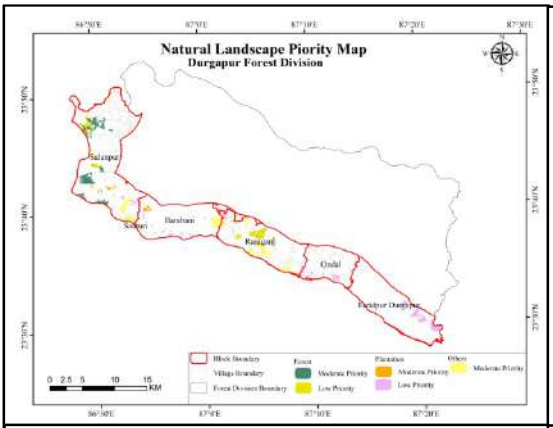
Piority area distrubution in Natural Landscape for Hazaribagh Wildlife forest Division

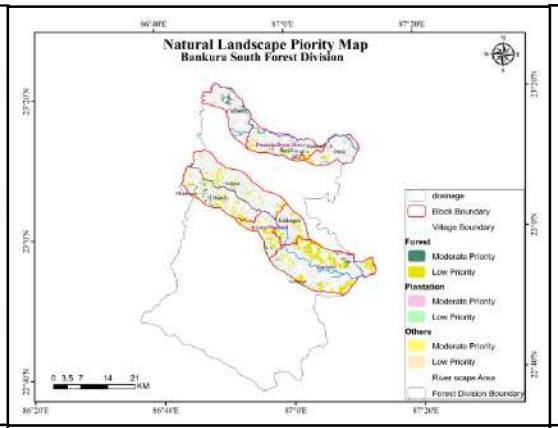


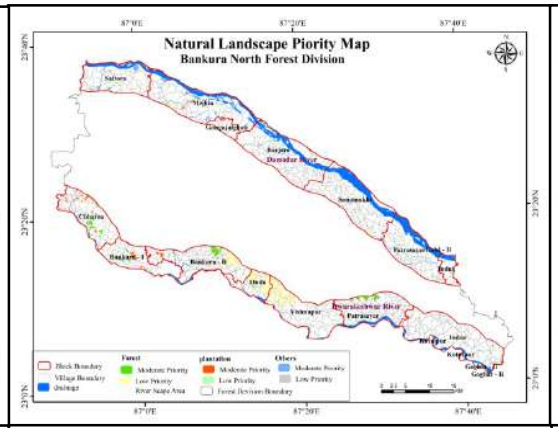
Priority area distribution in Natural La for Parasnath Forest division

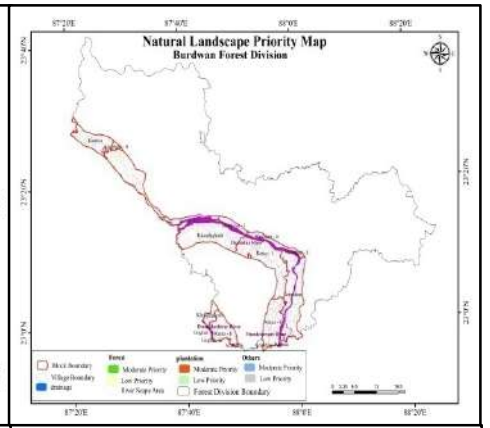


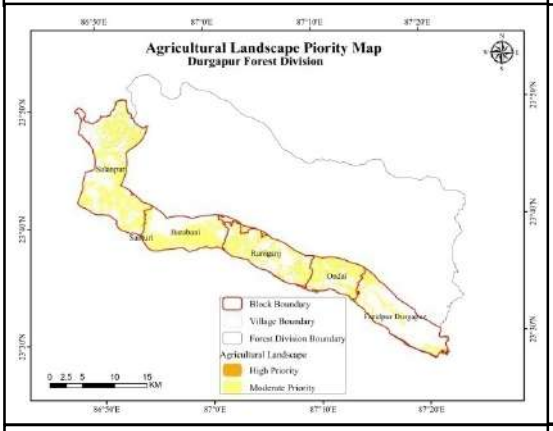
Forest Divisions wise area profile within the Damodar Riverscape for West Bengal

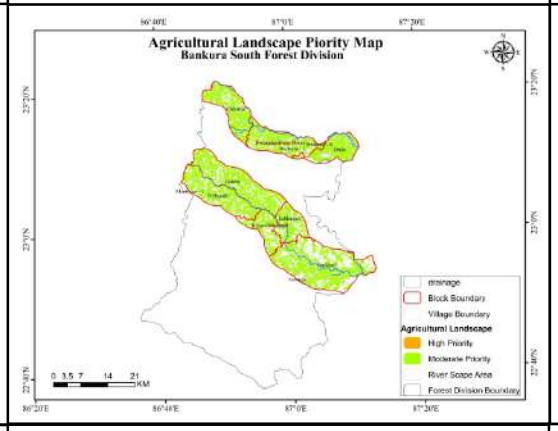


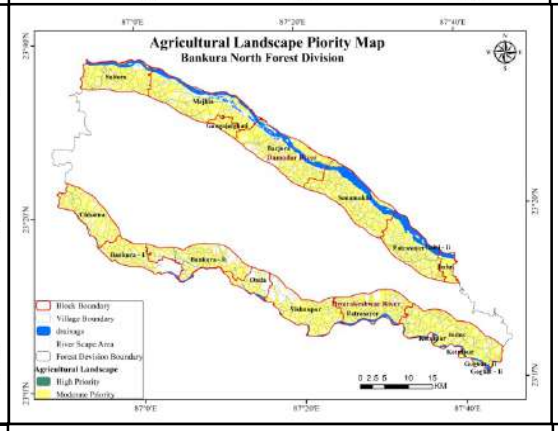


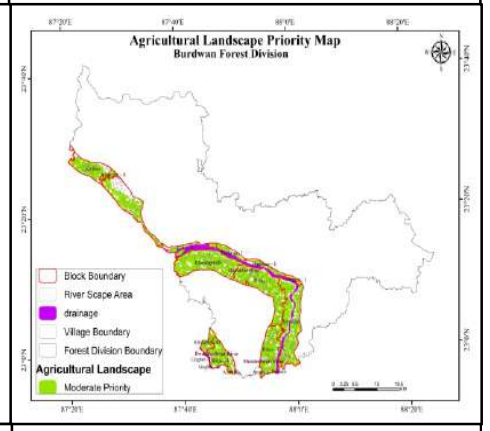


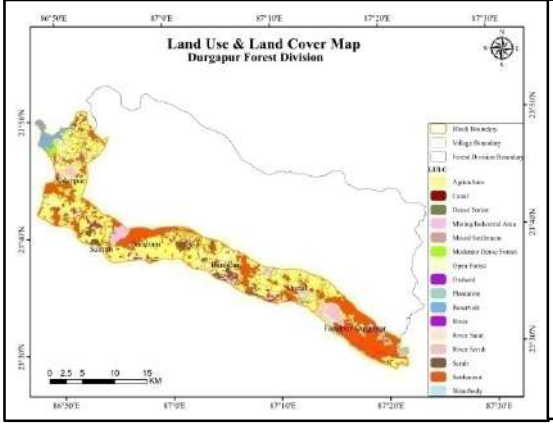


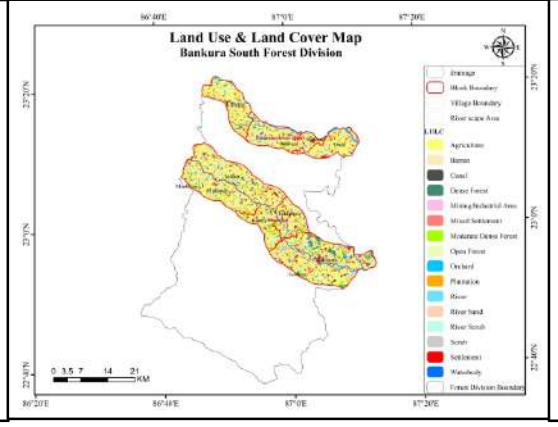


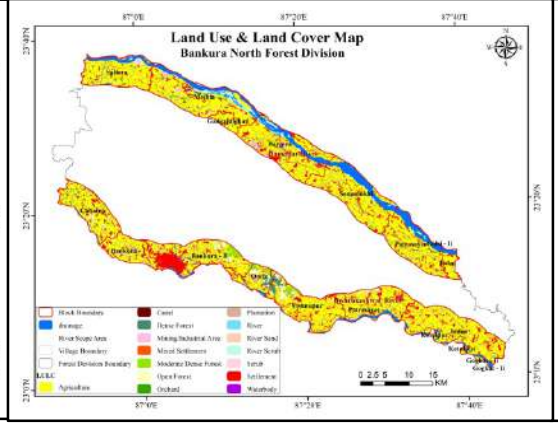


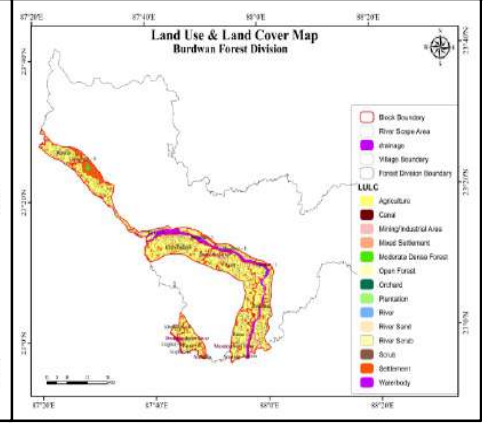


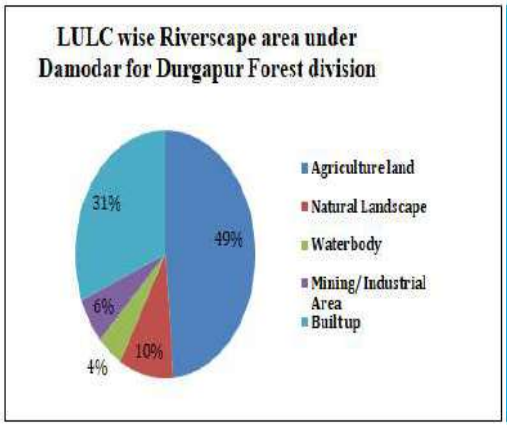


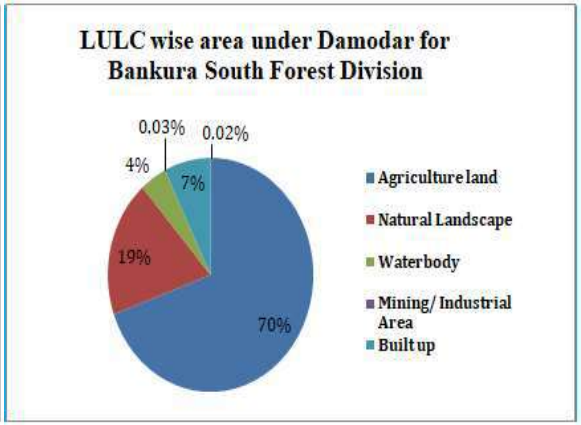


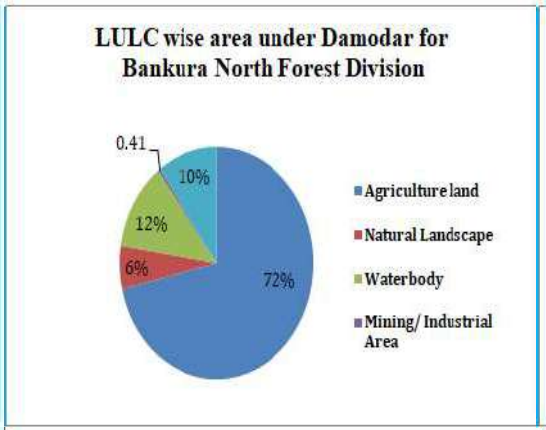


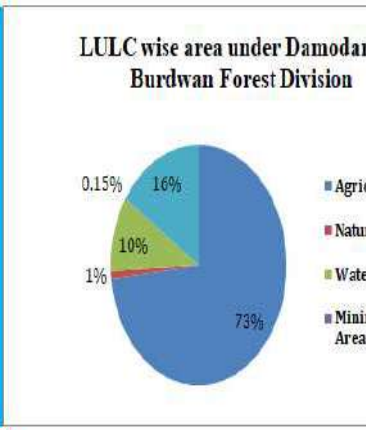


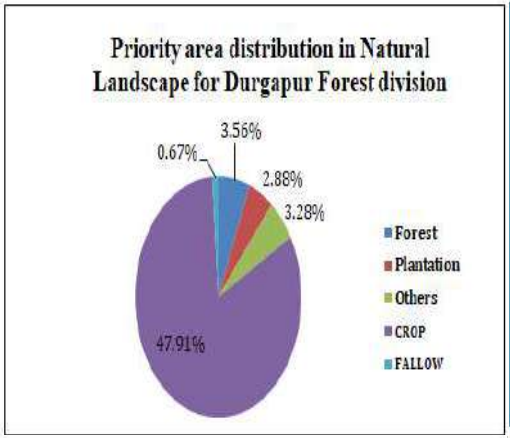


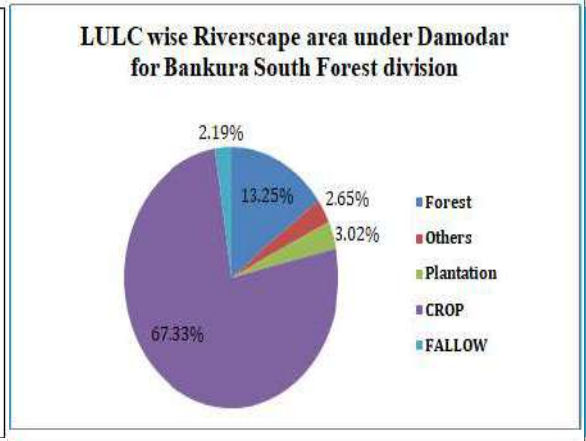

LULC wise Riverscape area under Damodar for Durgapur Forest division
31%
49%
6%
10%
4%
Agriculture land
Natural Landscape
Waterbody
Mining/ Industrial Area
Built up

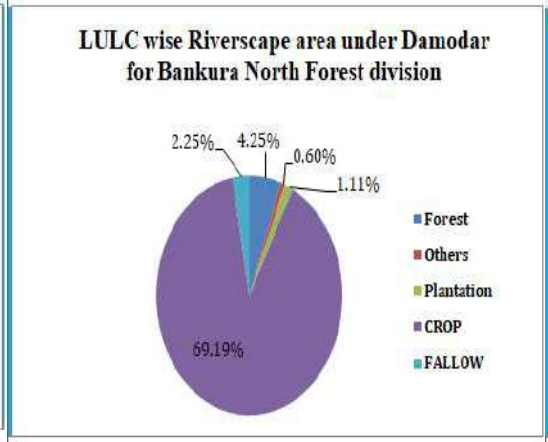

LULC wise area under Damodar for Bankura South Forest Division
0.03%
0.02%
4%
7%
19%
70%
Agriculture land
Natural Landscape
Waterbody
Mining/ Industrial Area
Built up

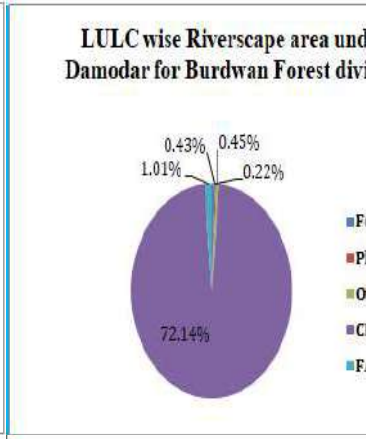

LULC wise area under Damodar for Bankura North Forest Division
0.41
10%
12%
6%
72%
Agriculture land
Natural Landscape
Waterbody
Mining/ Industrial Area

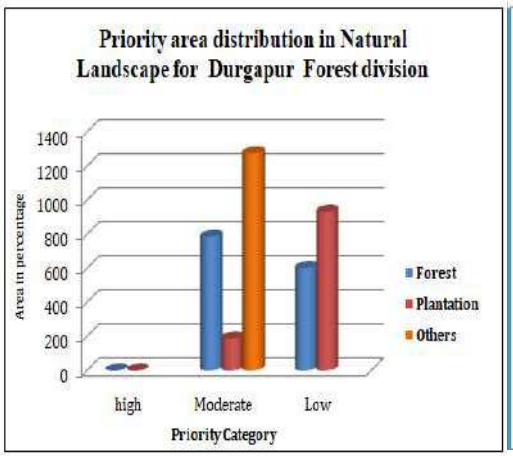

LULC wise area under Damodar
Burdwan Forest Division
0.15%
16%
10%
1%
73%

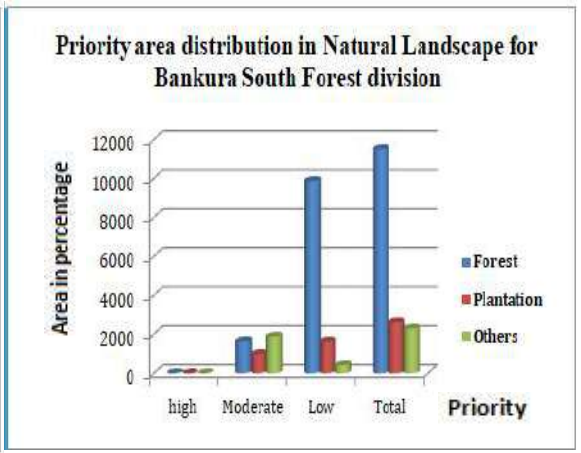

Priority area distribution in Natural Landscape for Durgapur Forest division
0.67%
3.56%
2.88%
3.28%
47.91%
Forest
Plantation
Others
CROP
FALLOW

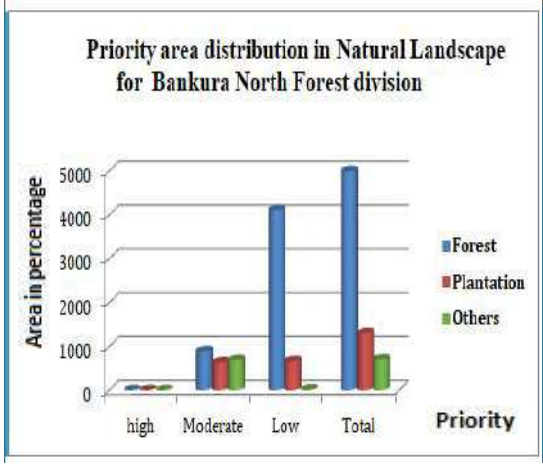

LULC wise Riverscape area under Damodar for Bankura South Forest division
2.19%
13.25%
2.65%
3.02%
67.33%
Forest
Others
Plantation
CROP
FALLOW

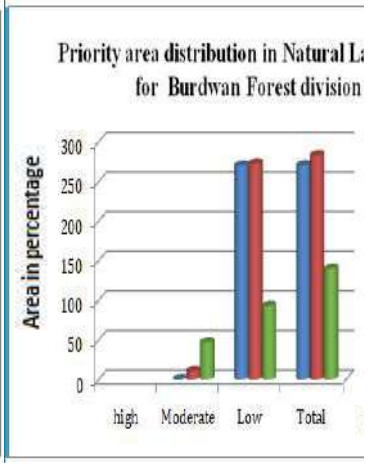

LULC wise Riverscape area under Damodar for Bankura North Forest division
2.25%
4.25%
0.60%
1.11%
69.19%
Forest
Others
Plantation
CROP
FALLOW


LULC wise Riverscape area und
Damodar for Burdwan Forest divi
0.43%
0.45%
1.01%
0.22%
72.14%

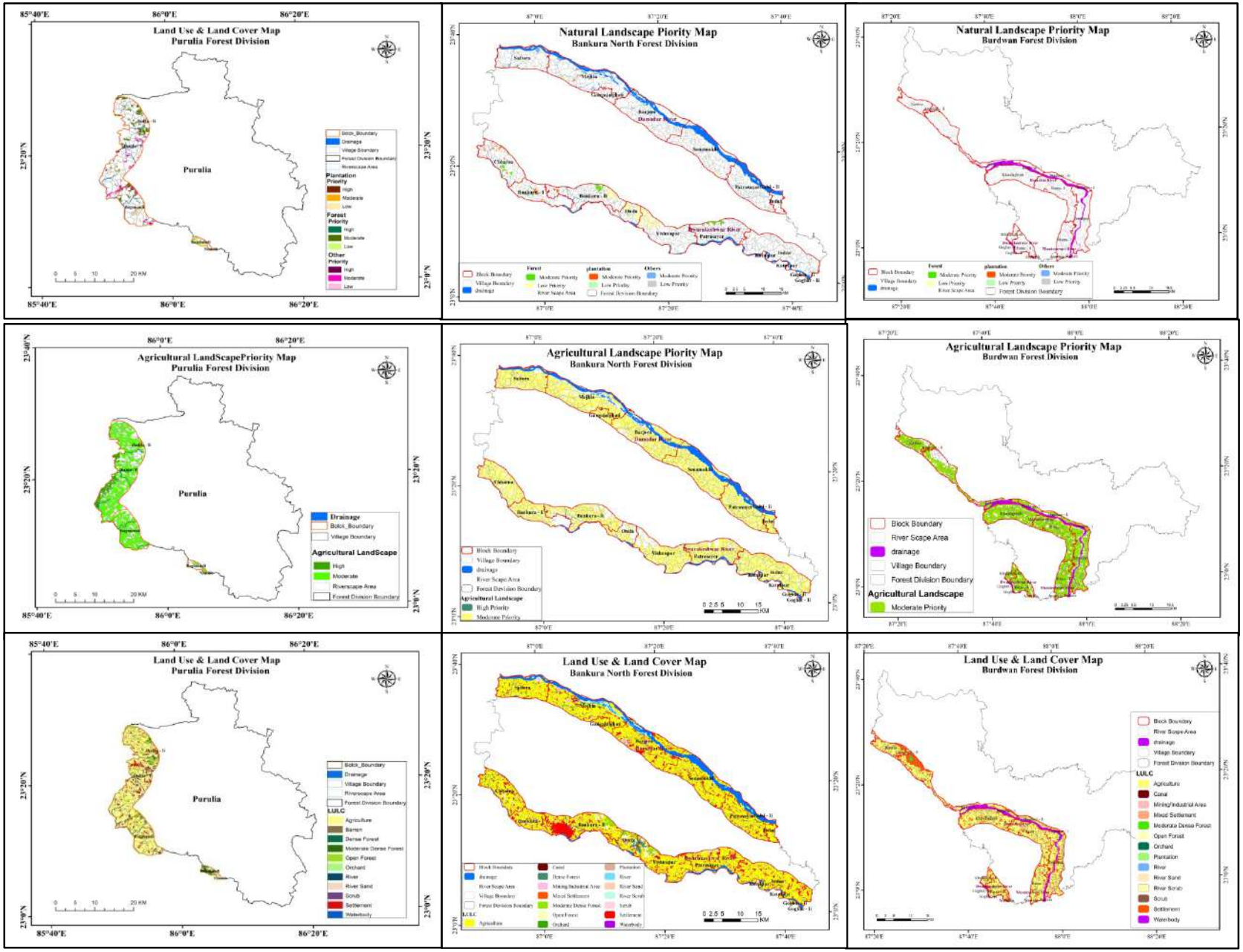

Priority area distribution in Natural Landscape for Durgapur Forest division
1400
1200
1000
800
600
400
200
0
Area in percentage
high
Moderate
Low
Priority Category
Forest
Plantation
Others

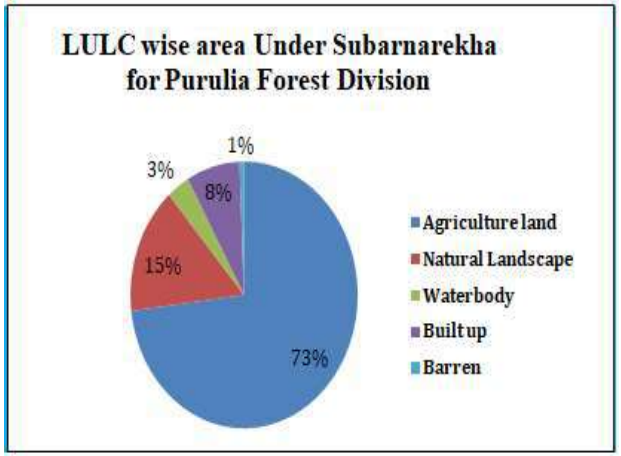

Priority area distribution in Natural Landscape for Bankura South Forest division
12000
10000
8000
6000
4000
2000
0
Area in percentage
high
Moderate
Low
Total
Priority
Forest
Plantation
Others

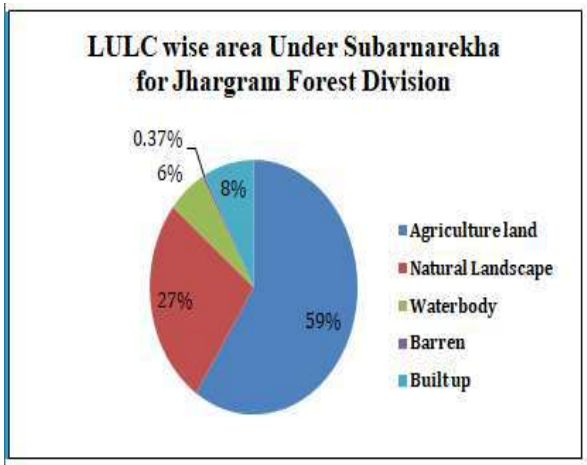

Priority area distribution in Natural Landscape for Bankura North Forest division
5000
4000
3000
2000
1000
0
Area in percentage
high
Moderate
Low
Total
Priority
Forest
Plantation
Others

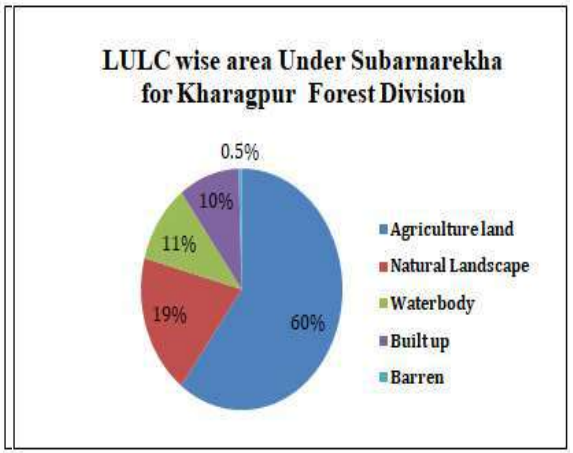

Priority area distribution in Natural L
for Burdwan Forest division
300
250
200
150
100
50
0
Area in percentage
high
Moderate
Low
Total

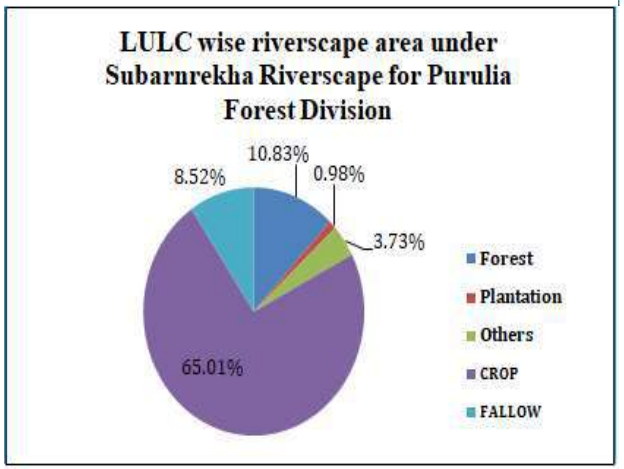
Forest Division wise area profile within the Subarnarekha Riverscape for West Bengal

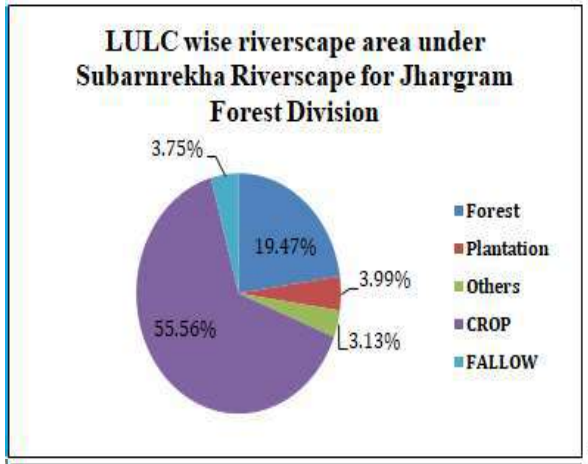


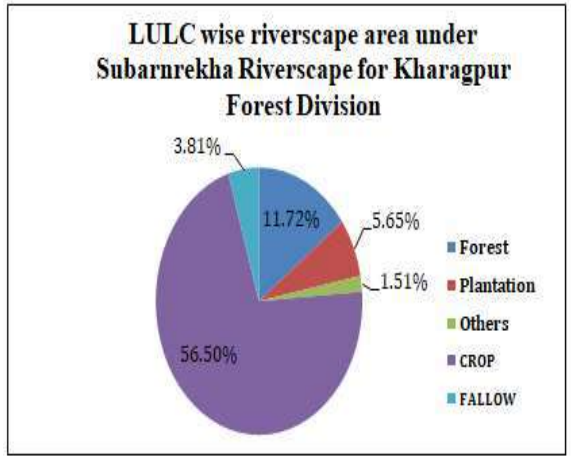

LULC wise area Under Subarnarekha for Purulia Forest Division
1%
3%
8%
15%
73%
Agriculture land
Natural Landscape
Waterbody
Built up
Barren

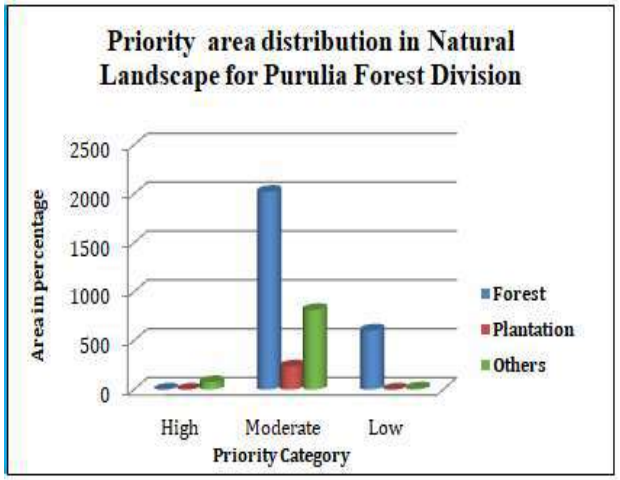

LULC wise area Under Subarnarekha for Jhargram Forest Division
0.37%
6%
8%
27%
59%
Agriculture land
Natural Landscape
Waterbody
Barren
Built up

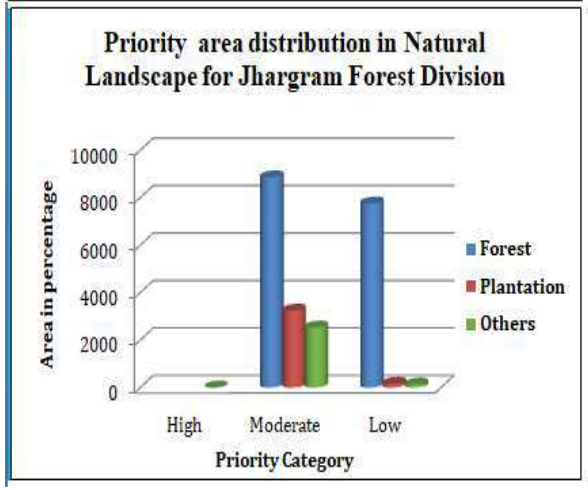

LULC wise area Under Subarnarekha for Kharagpur Forest Division
0.5%
10%
11%
19%
60%
Agriculture land
Natural Landscape
Waterbody
Built up
Barren

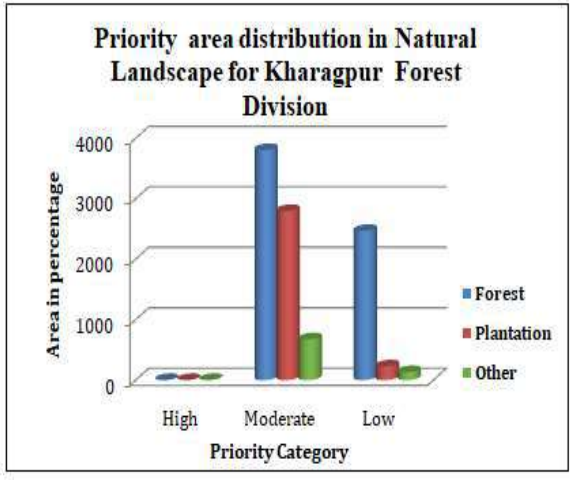

LULC wise riverscape area under Subarnrekha Riverscape for Purulia Forest Division
10.83%
8.52%
0.98%
3.73%
65.01%
Forest
Plantation
Others
CROP
FALLOW


LULC wise riverscape area under Subarnrekha Riverscape for Jhargram Forest Division
3.75%
19.47%
3.99%
55.56%
3.13%
Forest
Plantation
Others
CROP
FALLOW

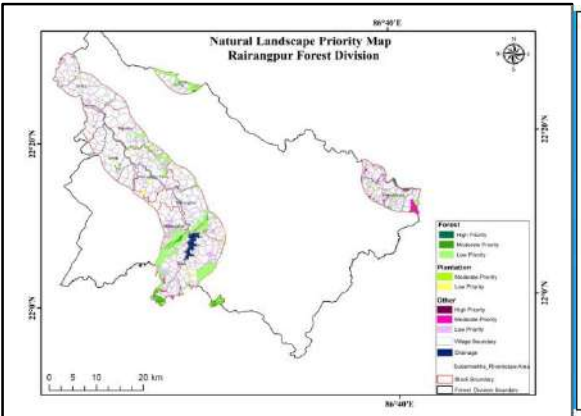

LULC wise riverscape area under Subarnrekha Riverscape for Kharagpur Forest Division
3.81%
11.72%
5.65%
1.51%
56.50%
Forest
Plantation
Others
CROP
FALLOW

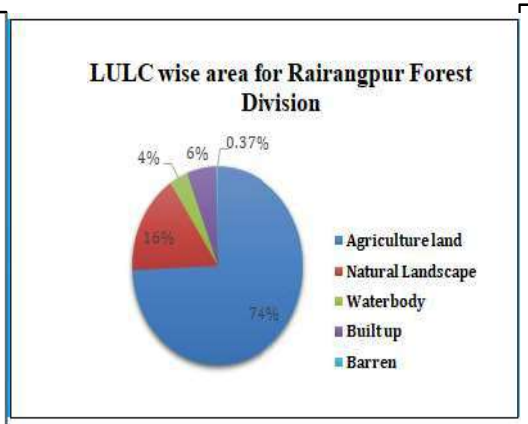

Priority area distribution in Natural Landscape for Purulia Forest Division
2500
2000
1500
1000
500
0
Area in percentage
High
Moderate
Low
Priority Category
Forest
Plantation
Others

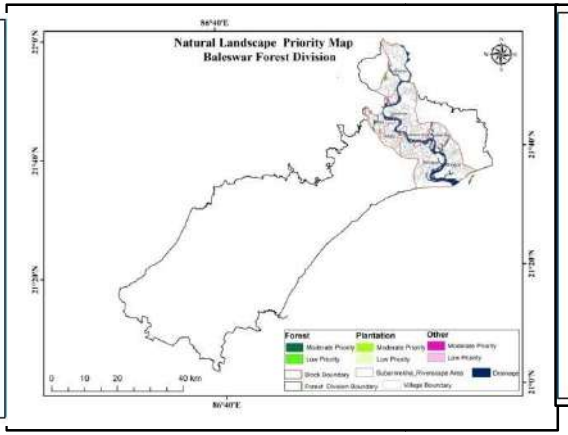

Priority area distribution in Natural Landscape for Jhargram Forest Division
10000
8000
6000
4000
2000
0
Area in percentage
High
Moderate
Low
Priority Category
Forest
Plantation
Others

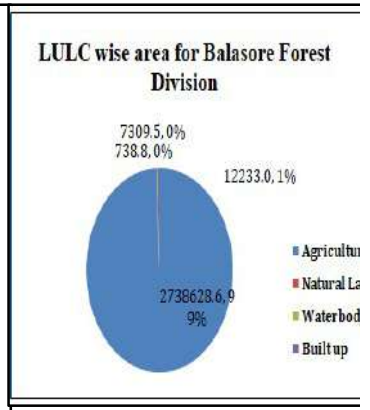

Priority area distribution in Natural Landscape for Kharagpur Forest Division
4000
3000
2000
1000
0
Area in percentage
High
Moderate
Low
Priority Category
Forest
Plantation
Other

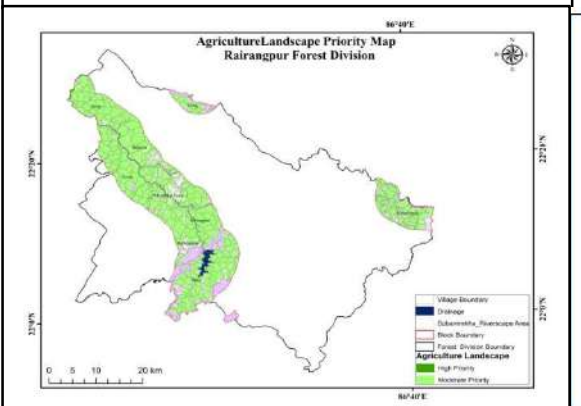
Forest Division wise area profile within the Subarnarekha River for Odisha

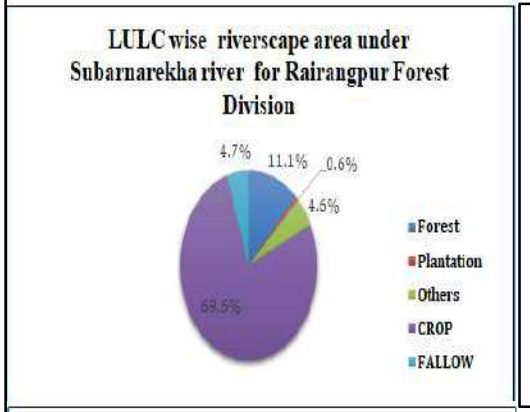


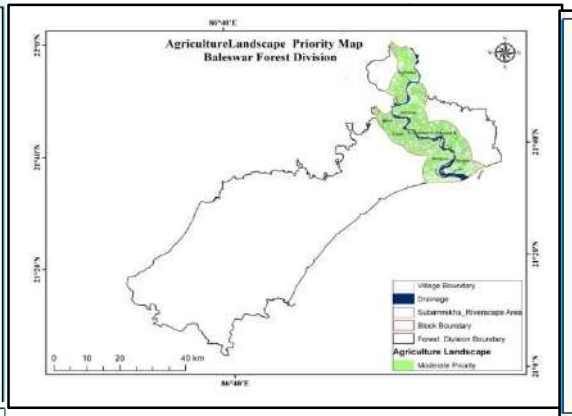


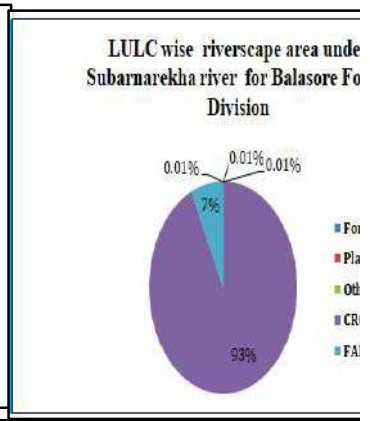


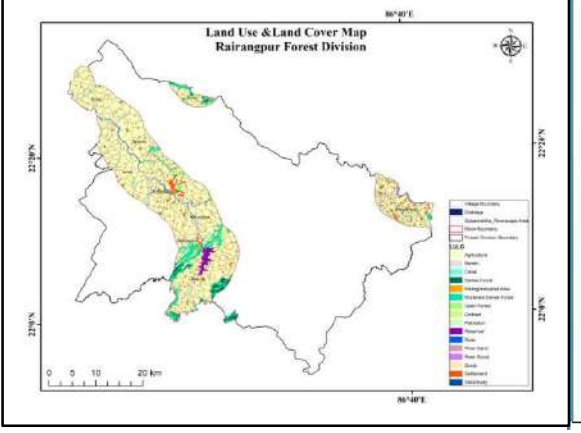


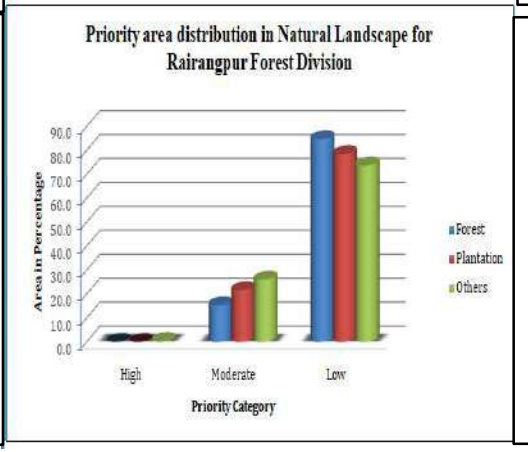


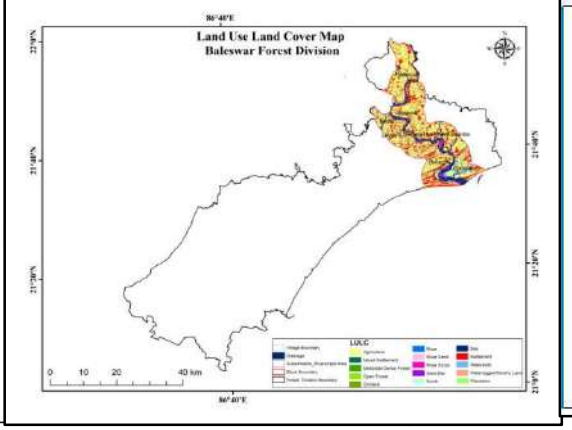


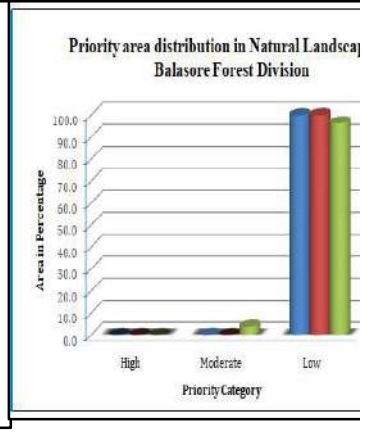




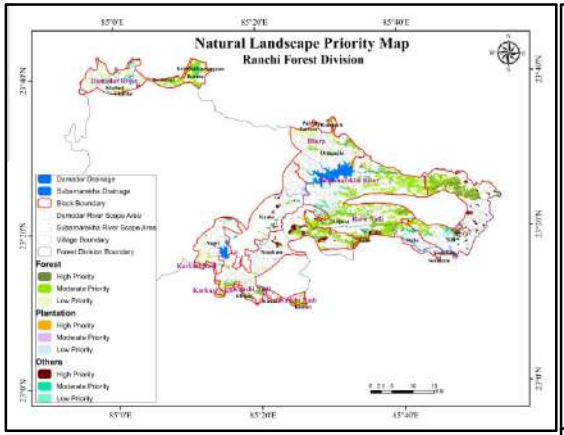


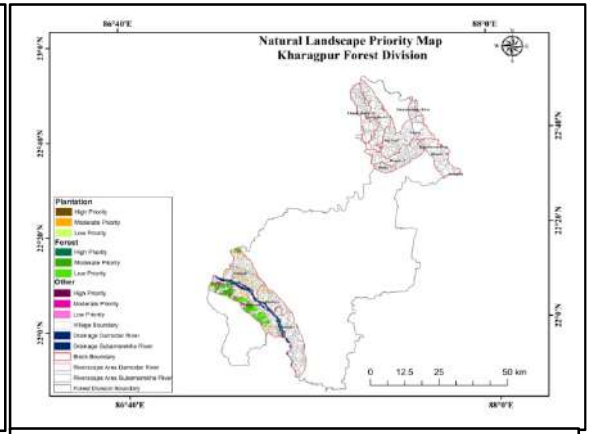


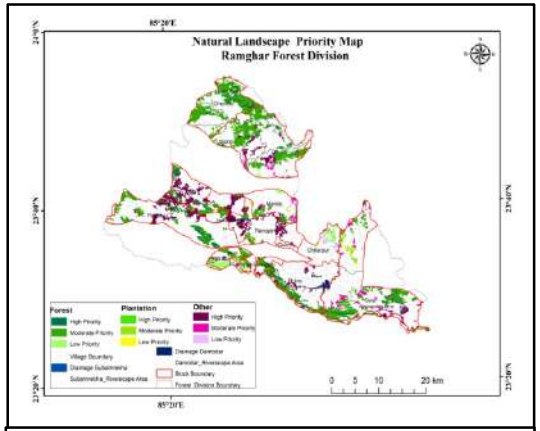


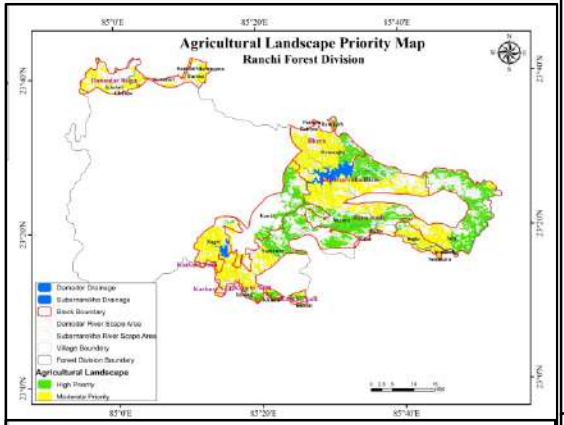


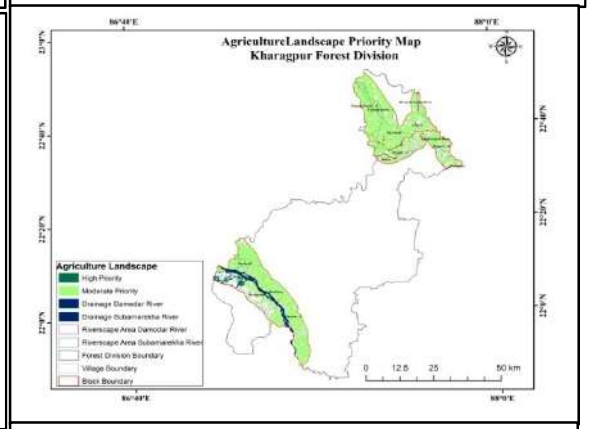
Profile for the Forest Divisions falling within the Riverscape of both the rivers

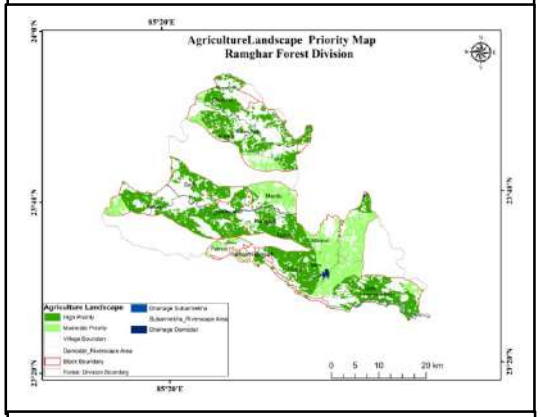


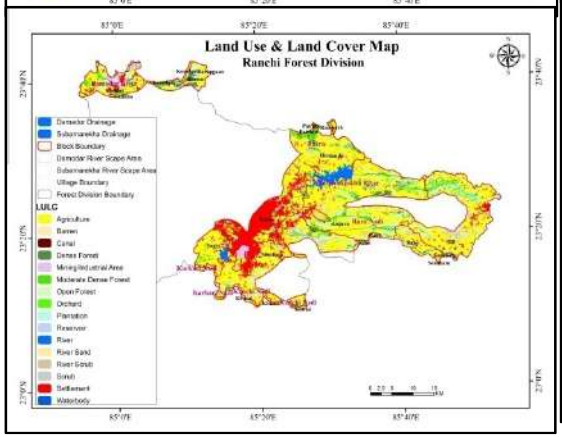


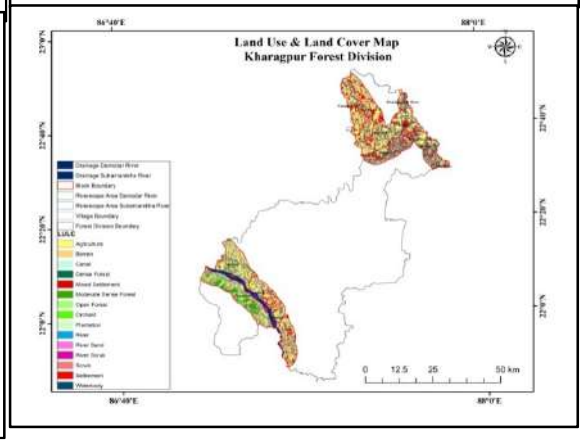


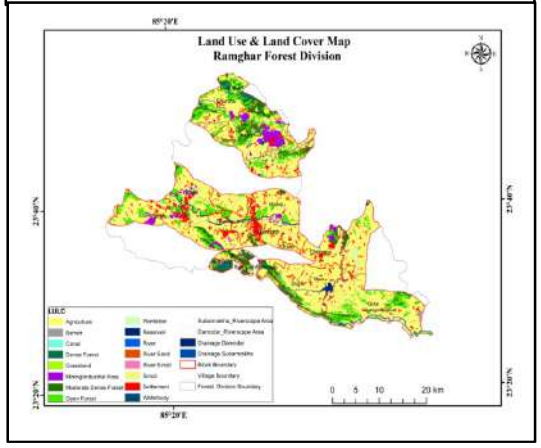




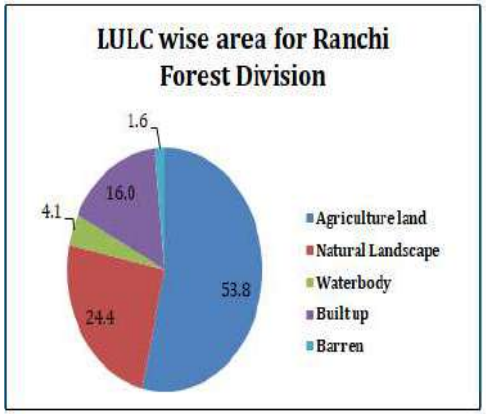


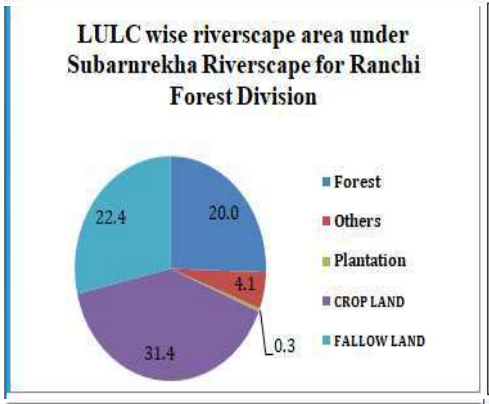


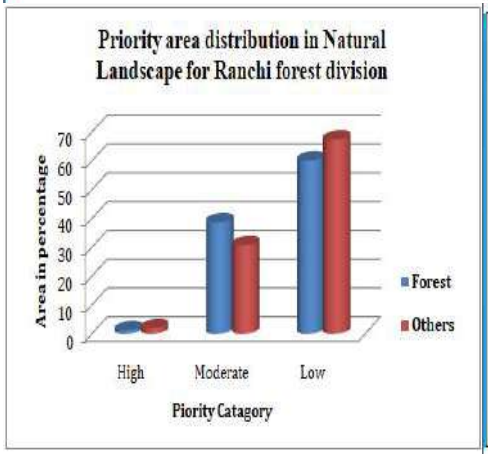




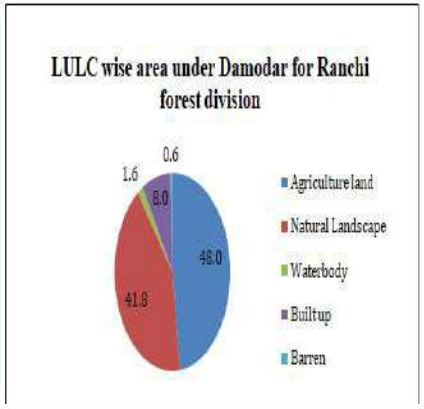
Subarnarekha Riverscape

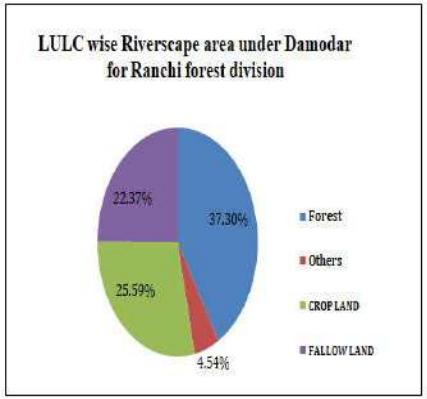


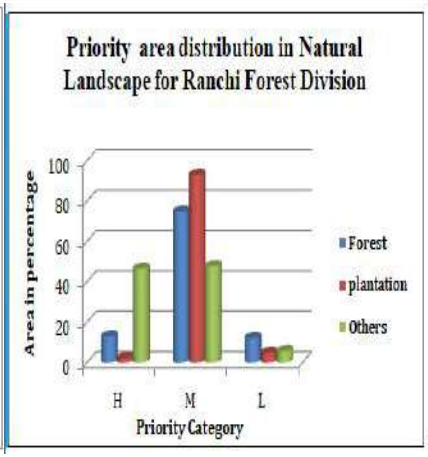




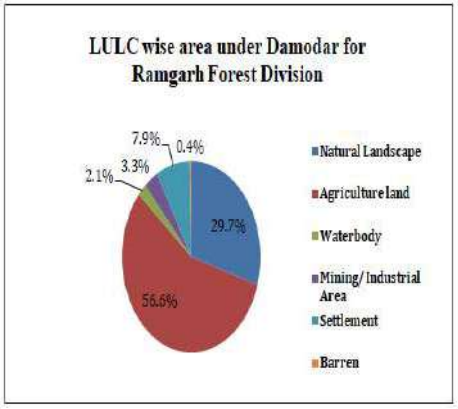
Damodar Riverscape

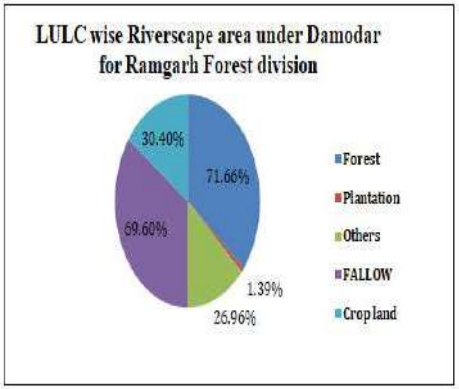


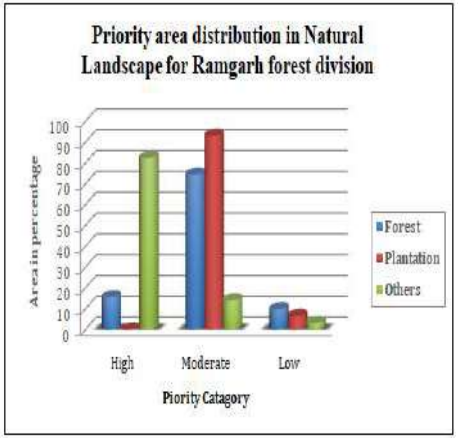




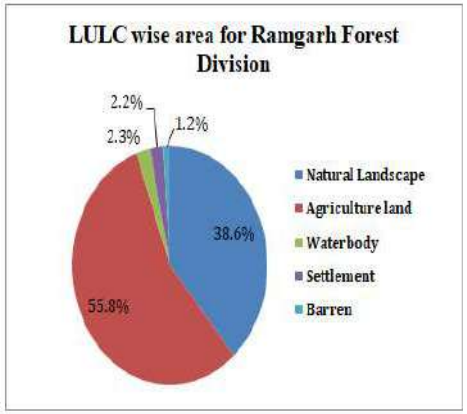
Damodar Riverscape

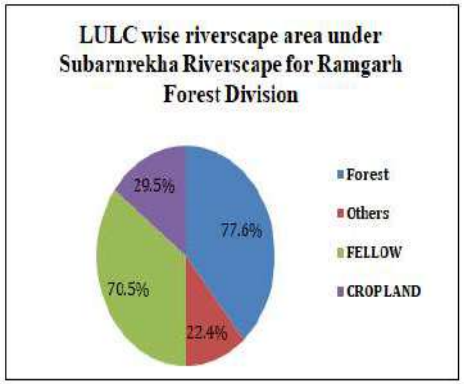


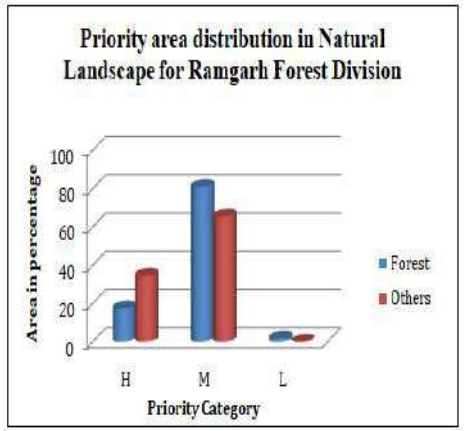




Subarnarekha Riverscape

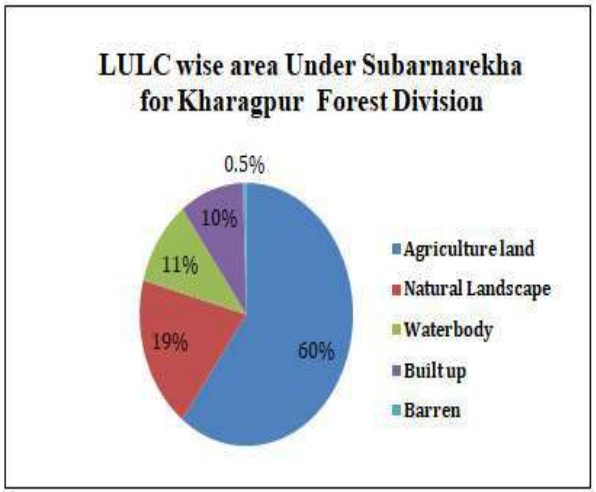


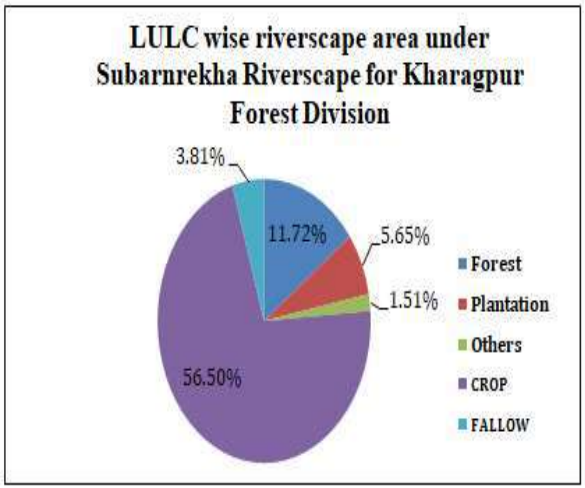


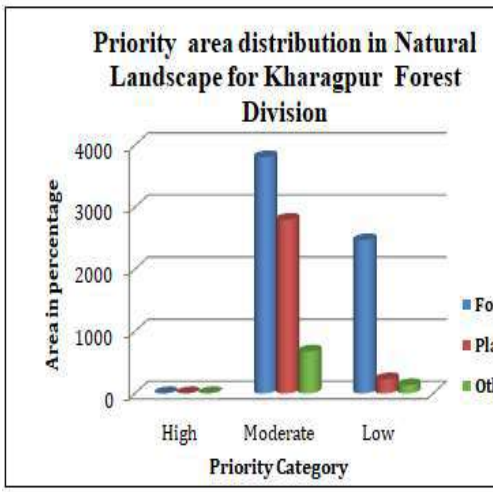


Subarnarekha Riverscape	Damodar Riverscape	Damodar Riverscape	Subarnarekha Ri

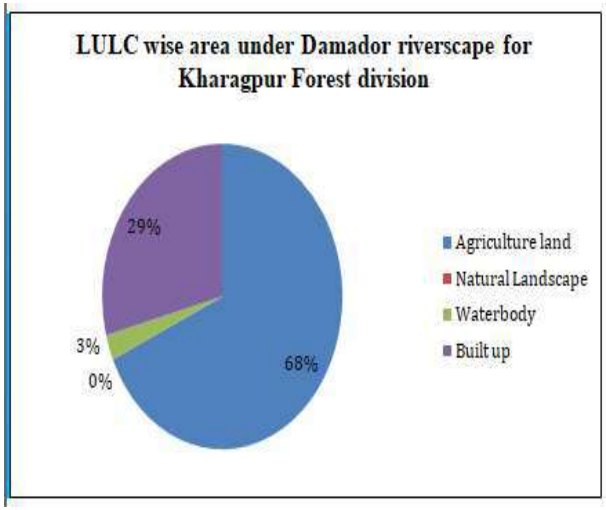
Subanarekha Riverscape

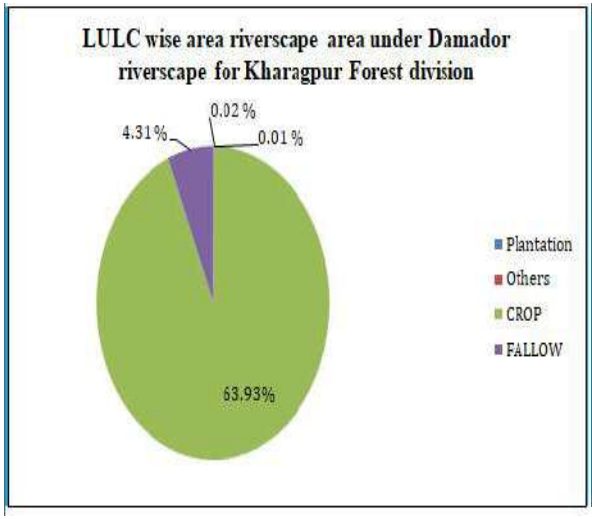


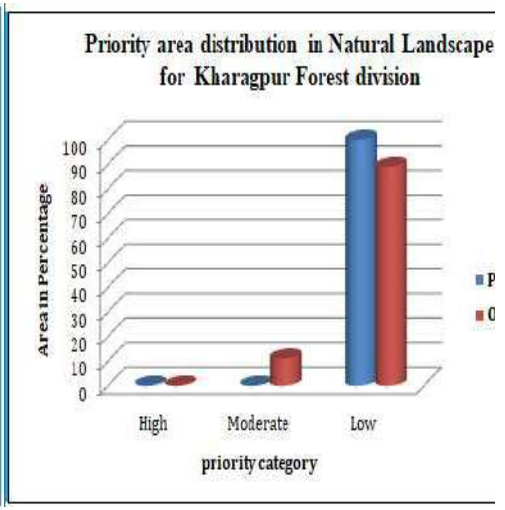




Damodar Riverscape







Annexure – III

Intervention Models

Forestry intervention strategies concerning river rejuvenation involve a combination of approaches aimed at improving the health and function of riparian ecosystems. The strategies typically focus on restoring indigenous vegetation, managing land use practices, and the adoption of sustainable forestry practices. Current DPR offers diverse intervention models to achieve aforementioned objectives. Following are some of major considerations that have been taken into account to formulate intervention models:

1. Based on LULC, three major categories of different land classes such as Natural, Agriculture, and Urban were delineated for the riverscape area.
2. A priority zonation map for the riverscape area was generated, considering various factors such as soil profile, slope, landscape, elevation, and landclass. Subsequently, High, Moderate, and Low priority areas were assigned and mapped for the riverscape.
3. Consultation with forest department officials to gain insight in their prioritised species to meet local goals.
4. Extensive field surveys were conducted to interact with farmers, and study the existing agriculture practices, and to gain insight to farmers and local people's perspective for the river rejuvenation and local environmental issues. These surveys aim to understand farmers' preferences for species selection in agroforestry models and homestead plantation.
5. Screening of species based on agro-climatic zone, forest type of the riverscape area, and stakeholder's preference.
6. Desirability and economical viability of agroforestry models.

Table.1: Proposed Intervention Models for West Bengal under Subarnrekha Riverscape

I - Natural Landscape (NL) Subarnarekha River		
States	**Model name**	**States Model name Model no.**
West Bengal	Sal and Associate Species Conservation Model	SB/WB/NL/01
West Bengal	Restoration of degraded Sal Forest Model	SB/WB/NL/02
West Bengal	Multiple shoot cutting	SB/WB/NL/03
West Bengal	Wetland Management Model	SB/WB/NL/04
West Bengal	Elephant Corridor Model	SB/WB/NL/05
II – Agricultural Landscape (AL) Subarnarekha River		
West Bengal	Silvi-Agri-Horticulture Model	SB/WB/AL/01
III – Urban Landscape (UL) Subarnarekha River		
West Bengal	River Front Development	SB/WB/UL/R/01
West Bengal	Park Development	SB/WB/UL/P/02

Table.2: Proposed Intervention Models for WB under Damodar Riverscape

I - Natural Landscape (NL) Damodar River		
States	**Model name**	**States Model name Model no.**
West Bengal	Sal and Associate Species Conservation Model	DM/WB/NL/01
West Bengal	Restoration of degraded Sal Forest Model	DM/WB/NL/02
West Bengal	Mixed Indigenous Species Conservation Model	DM/WB/NL/03
West Bengal	Elephant Corridor Model	DM/WB/NL/04
West Bengal	Wetland Management Model	DM/WB/NL/05
II – Agricultural Landscape (AL) Damodar River		
West Bengal	Silvi-Agri-Horticulture Model	DM/WB/AL/01
III – Urban Landscape (UL) Damodar River		
West Bengal	River Front Development	DM/WB/UL/R/01
West Bengal	Park Development	DM/WB/UL/P/02

***Model details and proposed costs are well discussed and described in the concerned chapters**.