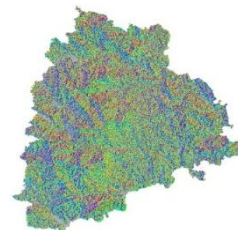
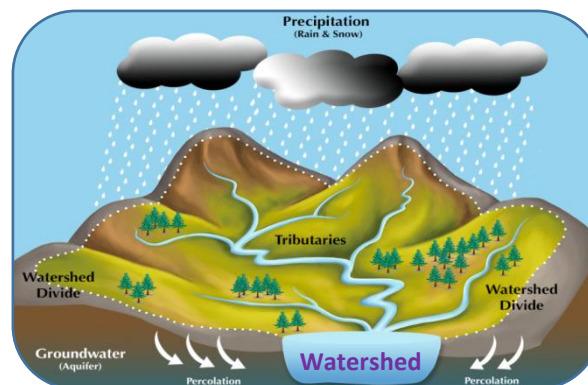


Government of Telangana – Forest Department



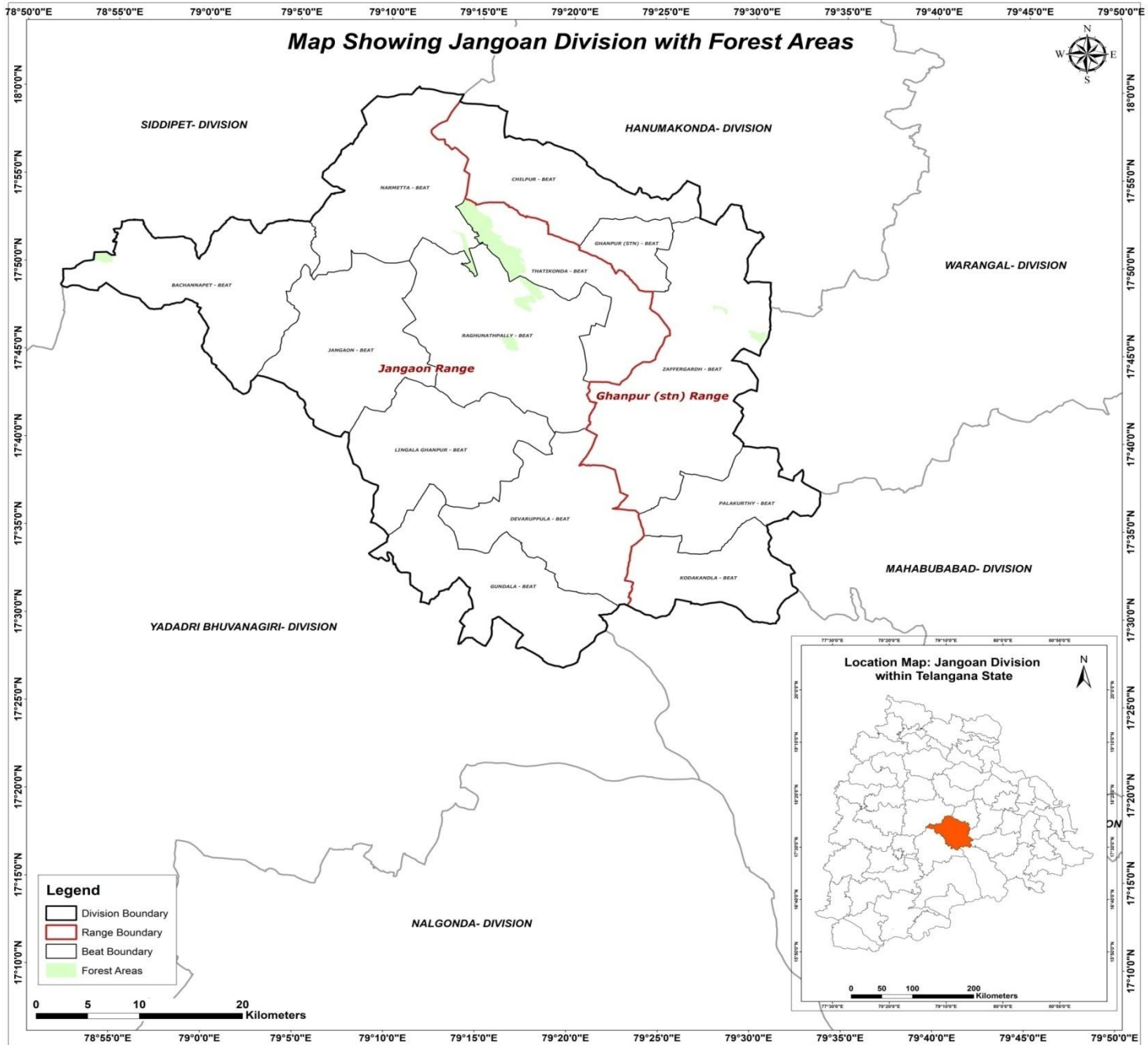
SITE SUITABILITY ANALYSIS FOR WATER HARVESTING STRUCTURES USING REMOTE SENSING & GIS



SITE SUITABILITY ANALYSIS FOR WATER HARVESTING STRUCTURES USING REMOTE SENSING & GIS

**Circle: Yadadri
District: Jangaon
Division: Jangaon**

**Prepared at Geomatics Centre
O/o Prl.Chief Conservator of Forests
Aranya Bhavan, Saifabad
Hyderabad - 500004**



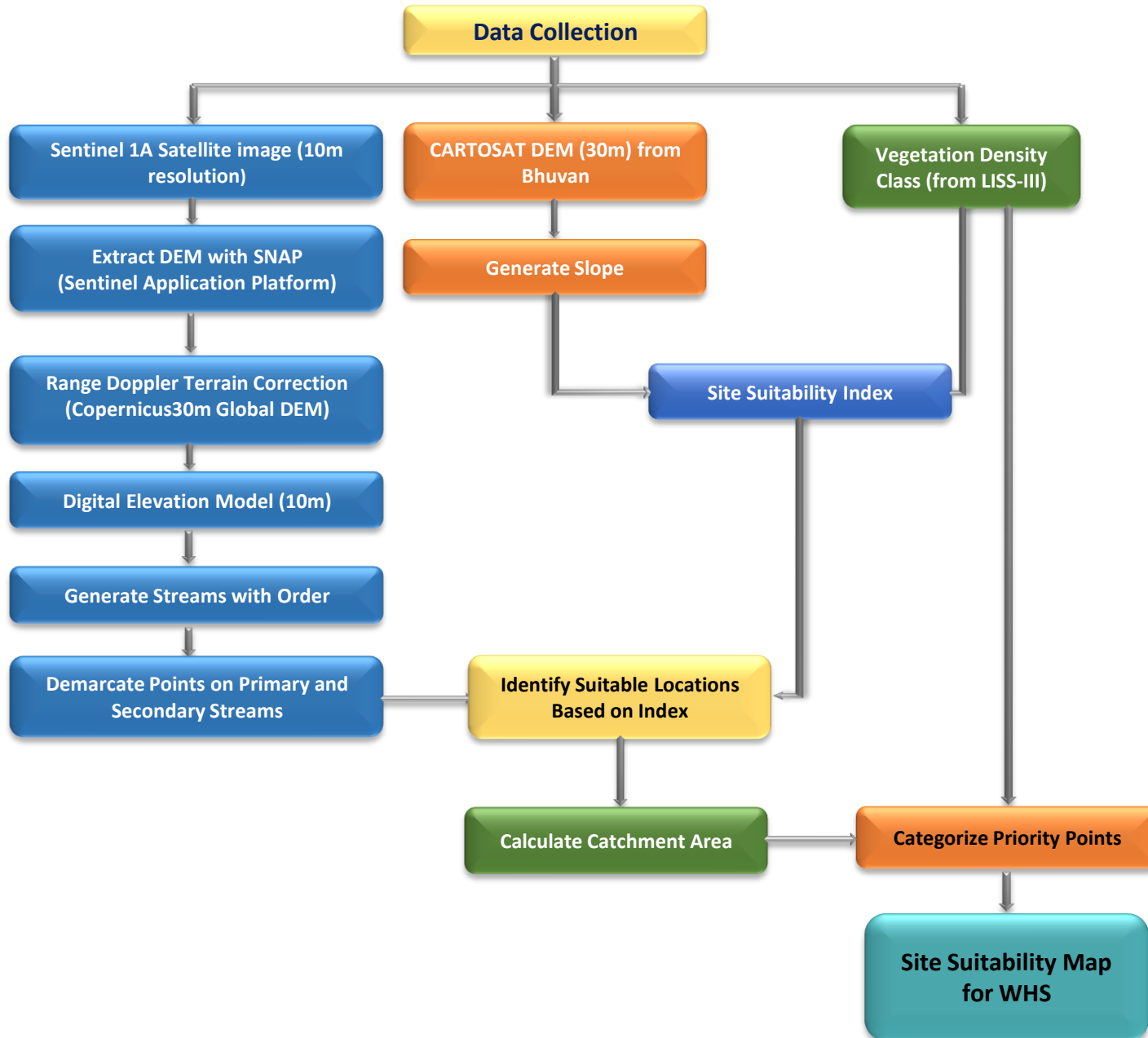
METHODOLOGY

Various methods are available to evaluate the suitability of locations for Percolation Tanks and other SMC structures using Arc GIS.

- A common approach is to use Geographic Information System (GIS) tools to decide the suitability by analysing factors like topography, vegetation density, distance to water sources, and terrain slope.
- Data was gathered from various sources, including the Raster Sentinel data obtained from the Copernicus open access hub.
- Elevation values were applied to the raster data using the SNAP software to create a Digital Elevation Model (DEM).
- Using Arc GIS, streams were mapped based on DEM, and potential percolation tank sites were identified based on stream order.
- Slope data generated from the CARTOSAT 30 m DEM (Source: Bhuvan) were also included in the analysis.
- By overlaying these spatial datasets and applying specific criteria, GIS can help identify optimal locations for building percolation tanks.
- Once the best location is identified, the catchment area is determined.
- The location is then ranked on the basis of catchment area and vegetation cover, with rankings ranging from I to V.



FLOW CHART FOR METHODOLOGY



Guidelines for building Percolation Tanks:

- Refer to the Site Suitability Map given by the GIS Cell for suitable locations
- Choose the best location for constructing a percolation tank based on the ranking priority. The priority for treatment of the watershed should be based on stream order, with primary streams taking precedence over secondary streams and secondary streams taking precedence over tertiary streams. This phased approach will ensure effective management of the watershed.
- Field conditions such as local climate, slope, vegetation and soil type must be considered when determining the location. It is important to move either upstream or downstream for a distance of about 50M, depending on the specific conditions of the site.
- It is essential to follow the priority given in the map. If no specific points are indicated, site suitability should be considered a determining factor.
- Encroached areas were not considered when demarcating points for constructing the Percolation tank.
- In the field, where streams are found at the optimal location, a percolation tank can be built if a point is missing on the map.
- The catchment area should also be considered when estimating the construction requirements like length of the bund, height of the bund, wear width etc., after verifying with the actual field conditions.
- Planting native vegetation around the tank can stabilize the soil, prevent erosion, and improve water absorption. Use plants that are well suited to the local environment.



Suitability criteria for Check-Dams and Percolation Tanks (SITE SUITABILITY INDEX)

Index	Slope(Degrees)	Density Class
Highly suitable	0-5	Blank & Scrub
Moderately suitable	0-5	Open Forest
Least suitable	0-5	Dense Forest

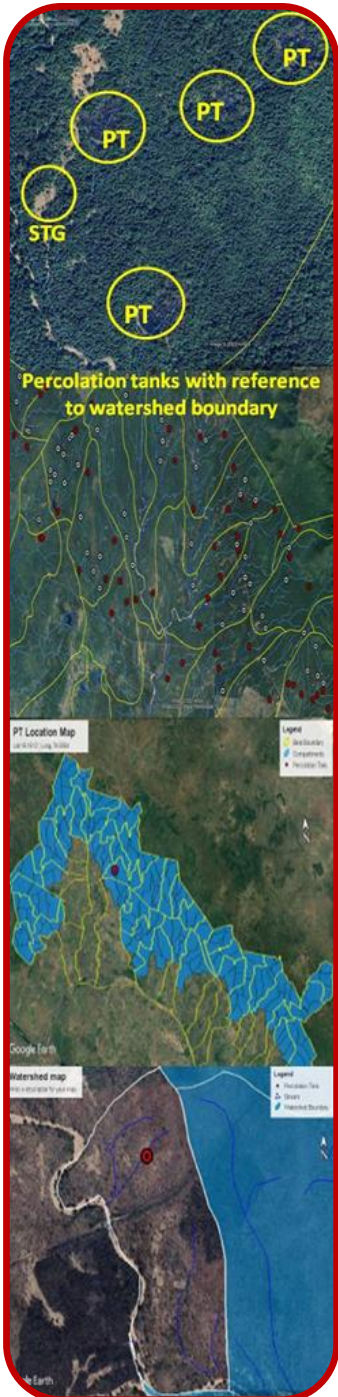
Suitability criteria for Continuous/Staggered contour trenches

Rank	Slope classes (Degrees)	Density Classes
Highly Suitable	>5 and <= 10	Blanks
Moderately Suitable	>5 and <= 10	Scrub forest
Least suitable	>5 and <= 10	Open forest
	> 10 and < 25	Blanks & scrubs
MPTs and SGPs	>5 and <= 10	Dense Forest
	> 10 and < 25	Open and Dense forest



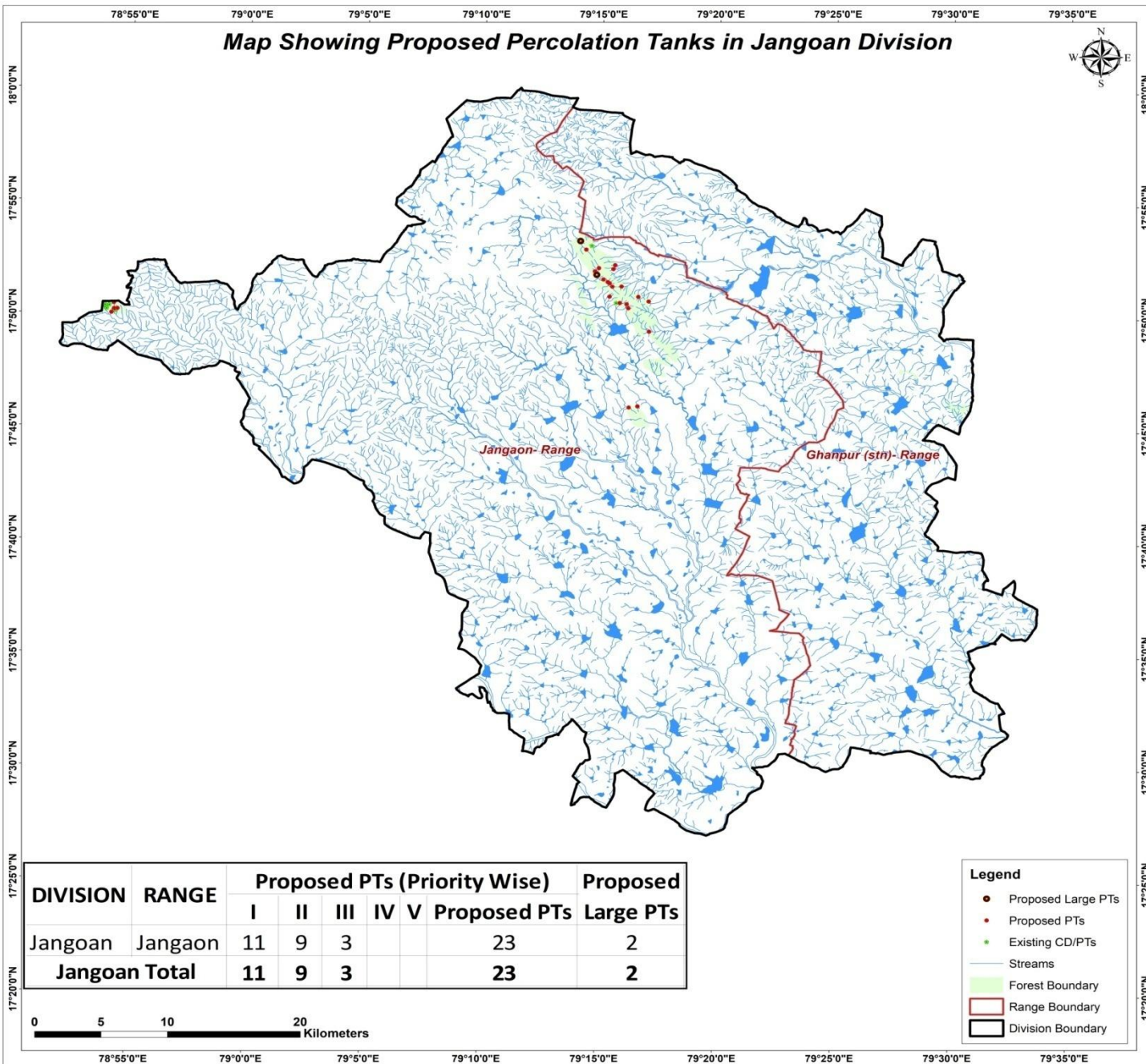
PRIORITY CLASSES FOR PERCOLATION TANK

Priority	Catchment Area(Ha)	Density Class
1	0-25	Scrub
	0-25	Blank
2	0-25	Open Forest
	25-50	Blank
3	25-50	Open Forest
	>50	Scrub & blank
4	0-25	Dense Forest
	>50	Open Forest
5	25-50	Dense Forest
	>50	Dense Forest





Map Showing Proposed Percolation Tanks in Jangoan Division

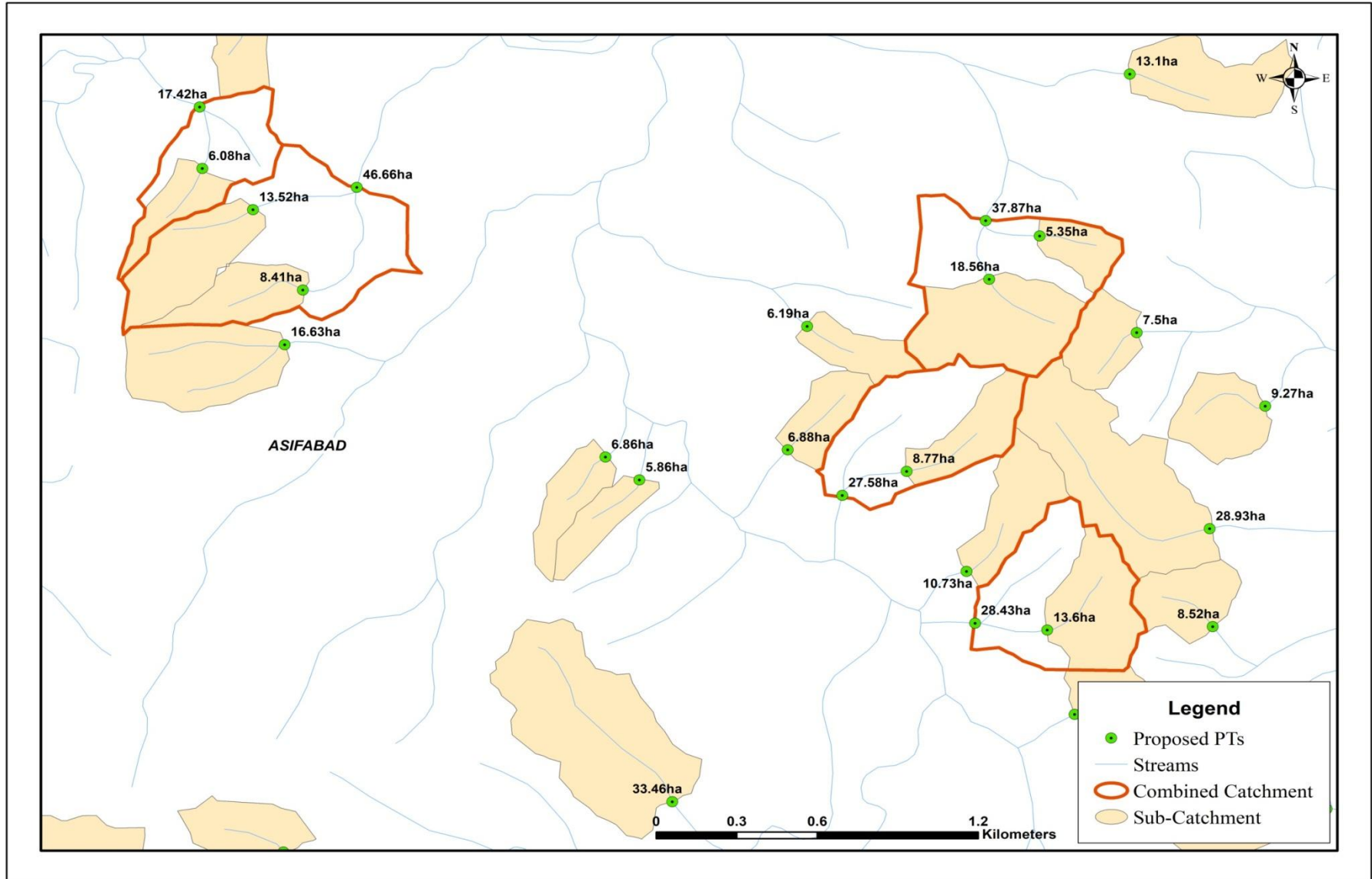


DIVISION	RANGE	Proposed PTs (Priority Wise)					Proposed PTs	Proposed Large PTs
		I	II	III	IV	V		
Jangoan	Jangaon	11	9	3			23	2
Jangoan Total		11	9	3			23	2

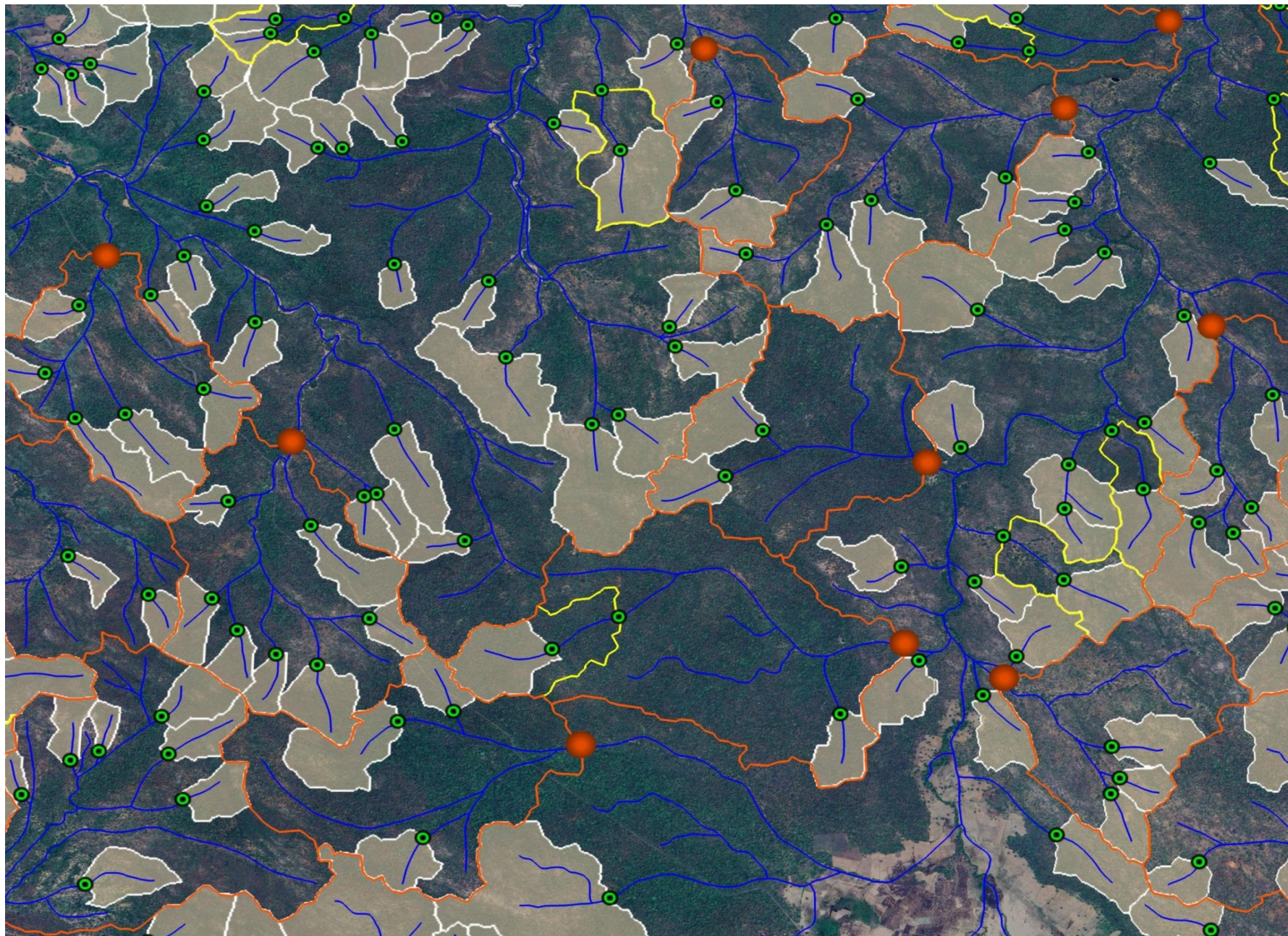
- Legend**
- Proposed Large PTs
 - Proposed PTs
 - Existing CD/PTs
 - Streams
 - Forest Boundary
 - Range Boundary
 - Division Boundary

0 5 10 20 Kilometers

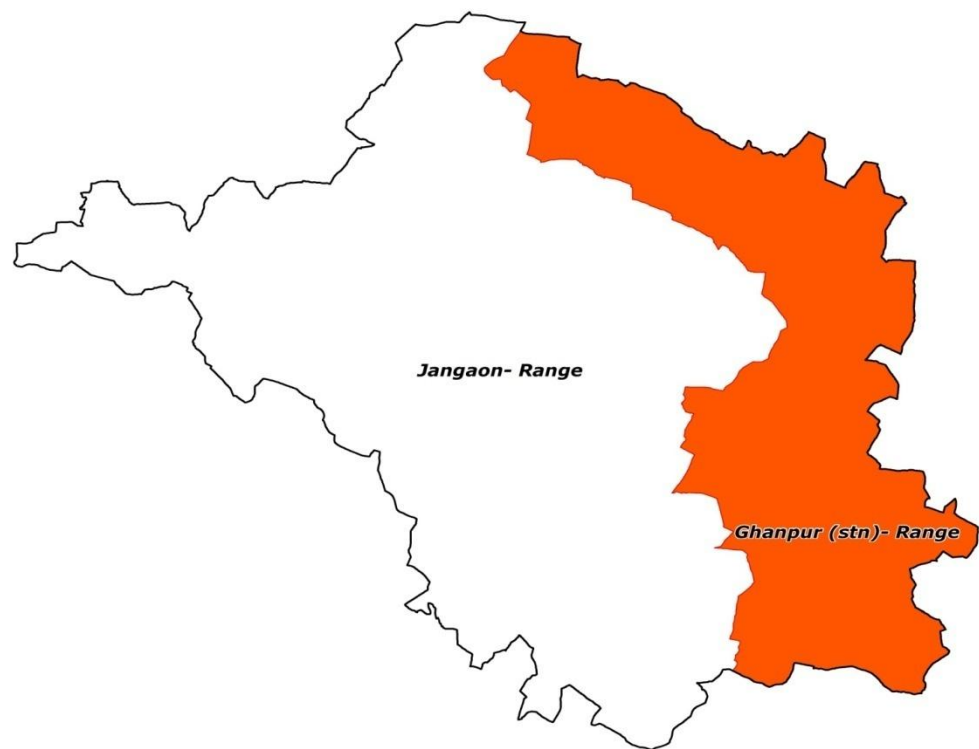
CATCHMENT AREA



Sample Catchment Map

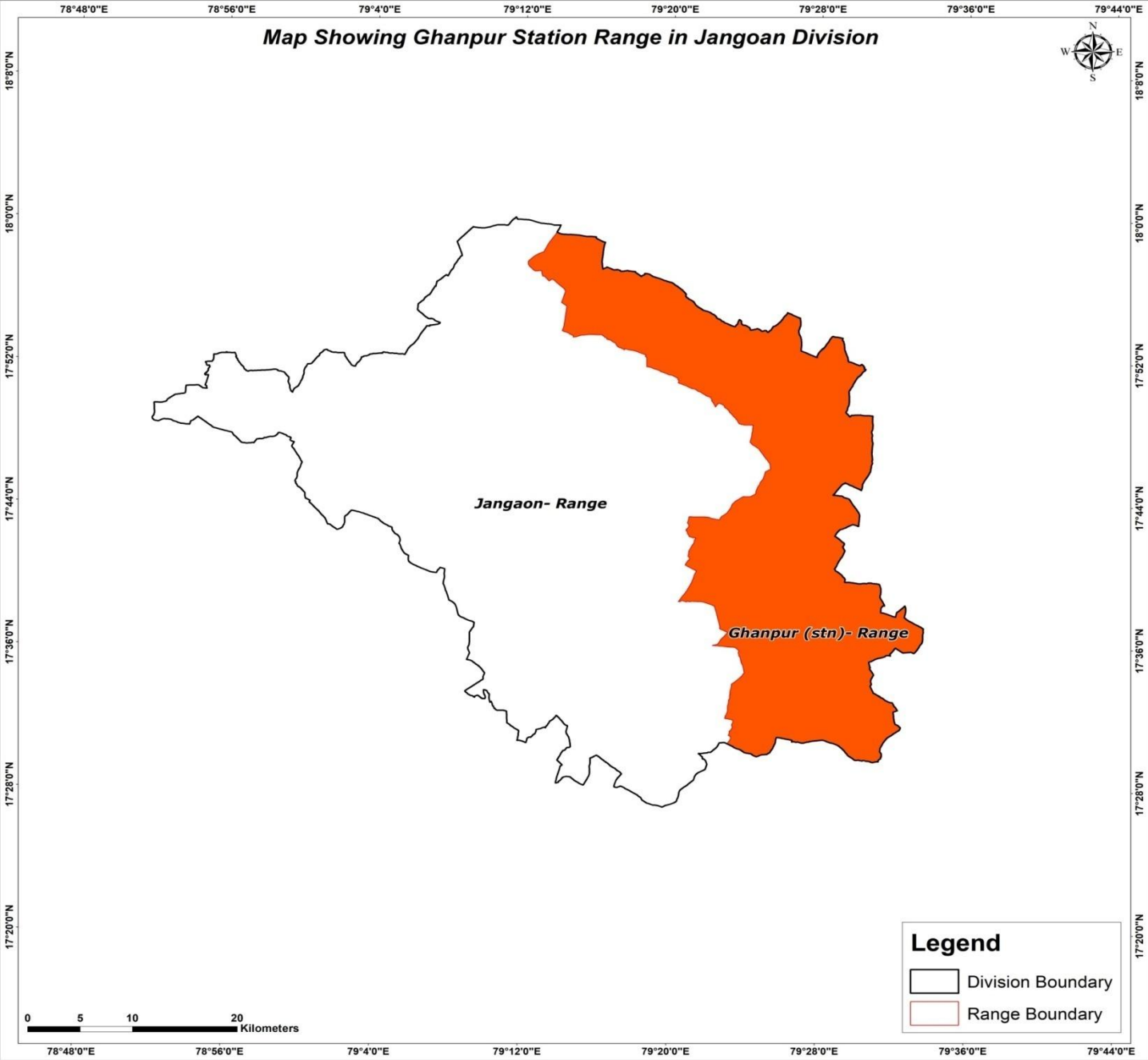


Map Showing Ghanpur Station Range in Jangoan Division



Jangoan- Range

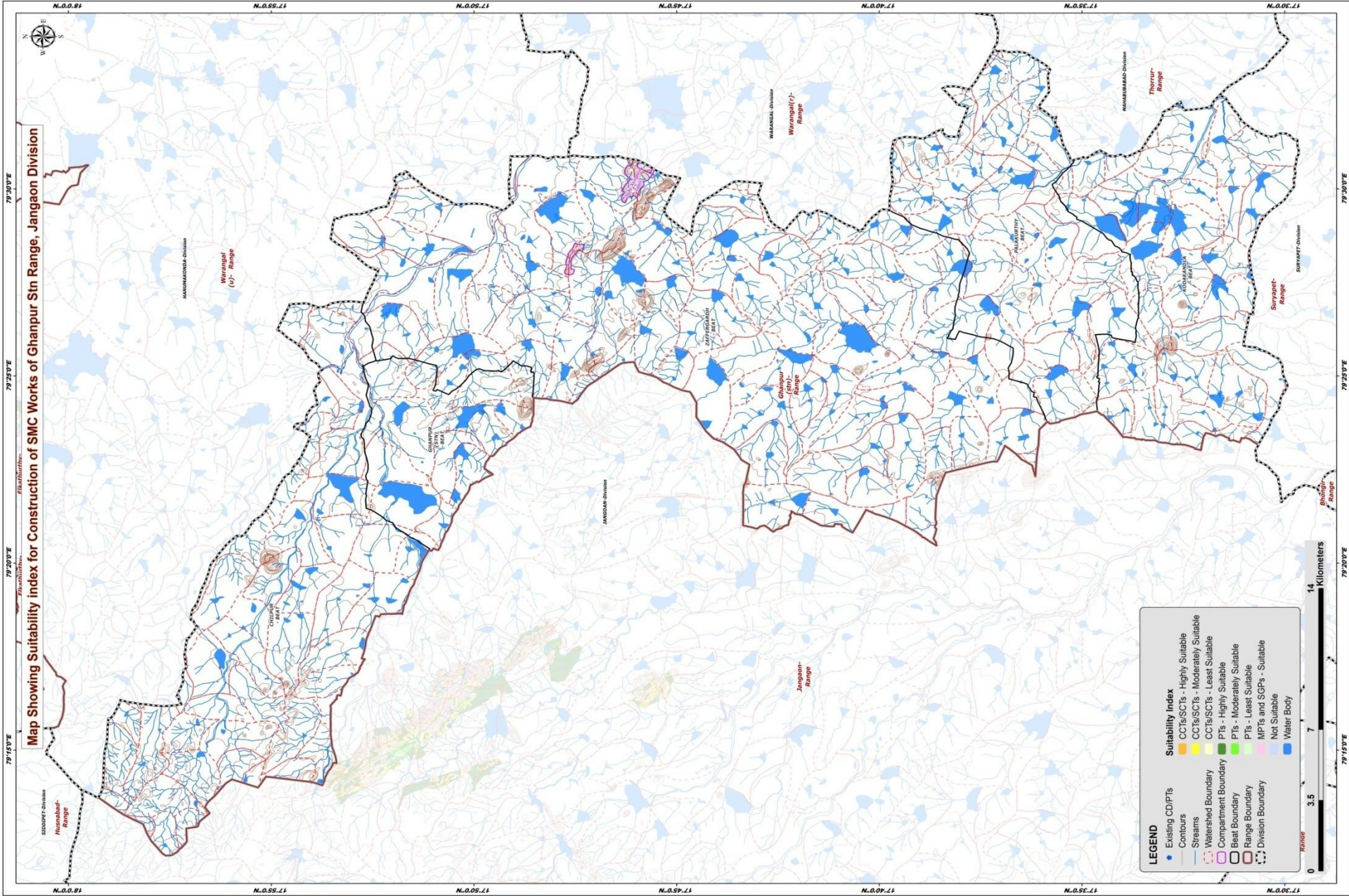
Ghanpur (stn)- Range



Legend

- Division Boundary
- Range Boundary

Map Showing Suitability Index for Construction of SMC Works of Ghanpur Stn Range, Jangaon Division

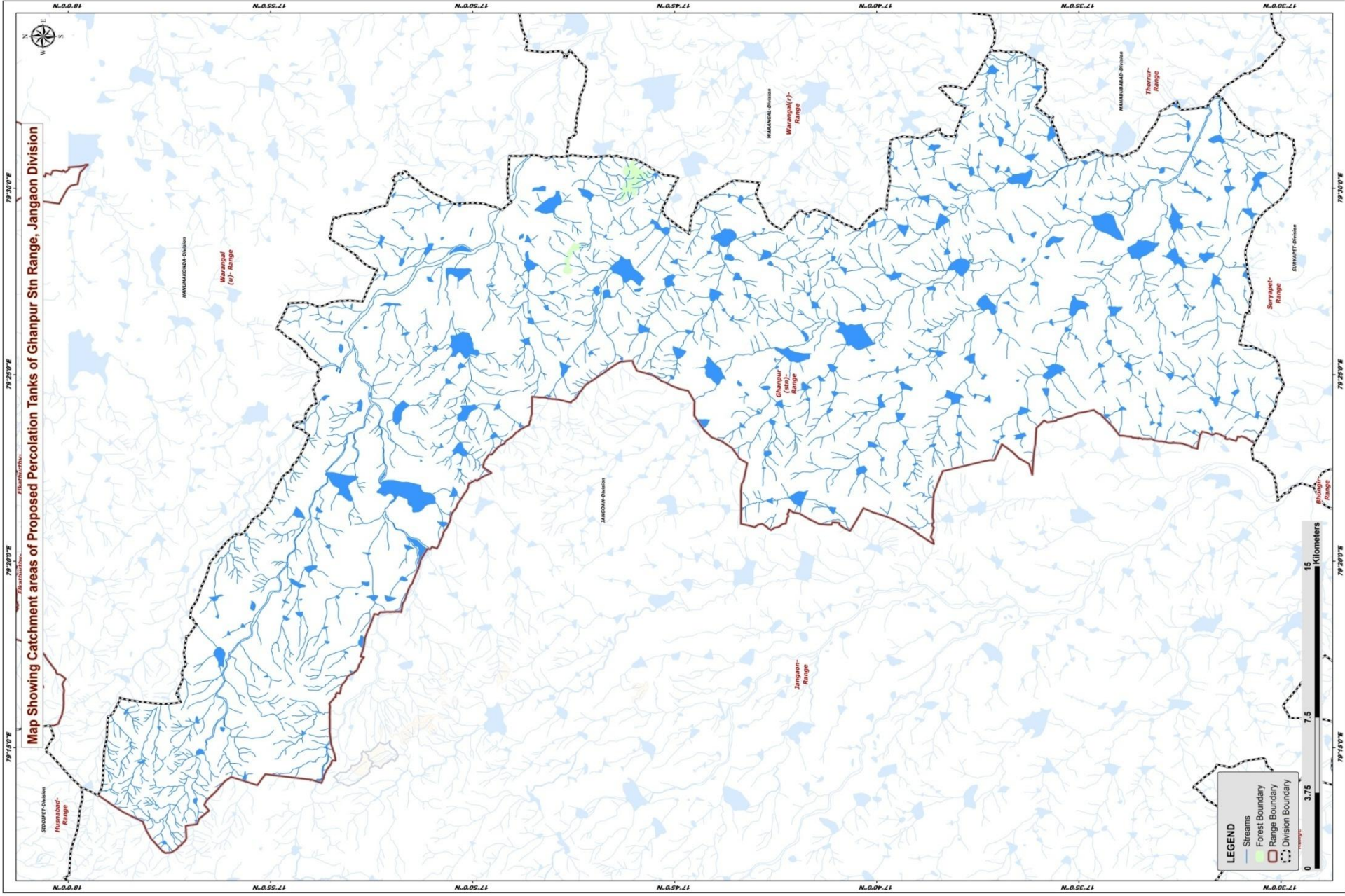


LEGEND

● Existing CD/PTS	Suitability Index
— Contours	■ CCTs/SCTs - Highly Suitable
— Streams	■ CCTs/SCTs - Moderately Suitable
— Watershed Boundary	■ CCTs/SCTs - Least Suitable
— Compartment Boundary	■ PTS - Highly Suitable
— Beat Boundary	■ PTS - Moderately Suitable
— Range Boundary	■ PTS - Least Suitable
— Division Boundary	■ MPTs and SGP - Suitable
—	■ Not Suitable
—	■ Water Body



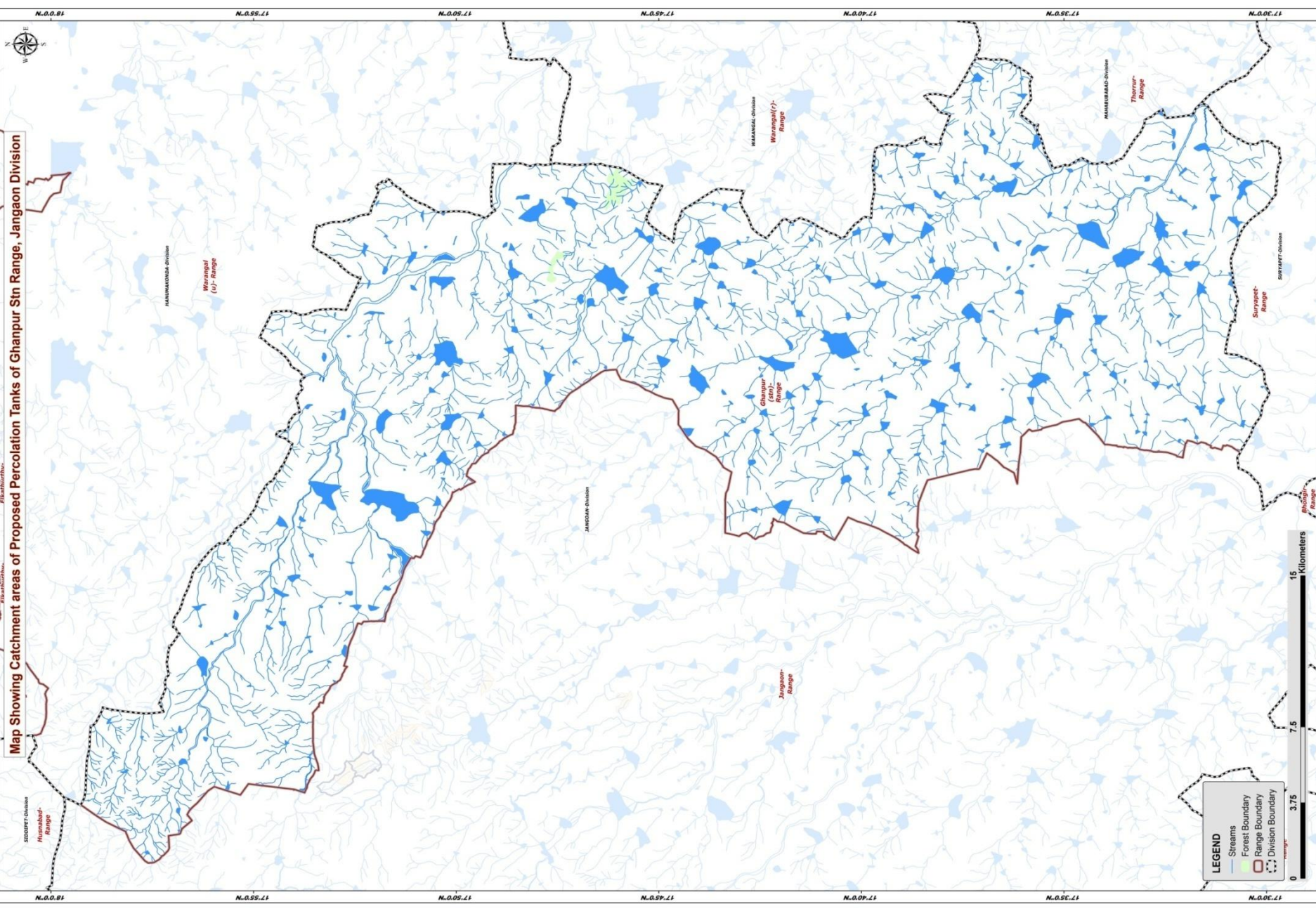
Map showing the suitability index for construction of SMC works in the Ghanpur Stn Range, Jangaon Division. The map includes labels for various ranges and divisions: Muzaffarpur Range, Waringal (U) Range, Ghanpur Range, Jangaon Range, Warangal Range, Thorer Range, and Suryapet Range. It also identifies specific beats such as SINGH BEAT, CHANDRA BEAT, and KOTAPUR BEAT. The map is overlaid with a grid of latitude and longitude coordinates.



Map Showing Catchment areas of Proposed Percolation Tanks of Ghanpur Stn Range, Jangaon Division

LEGEND

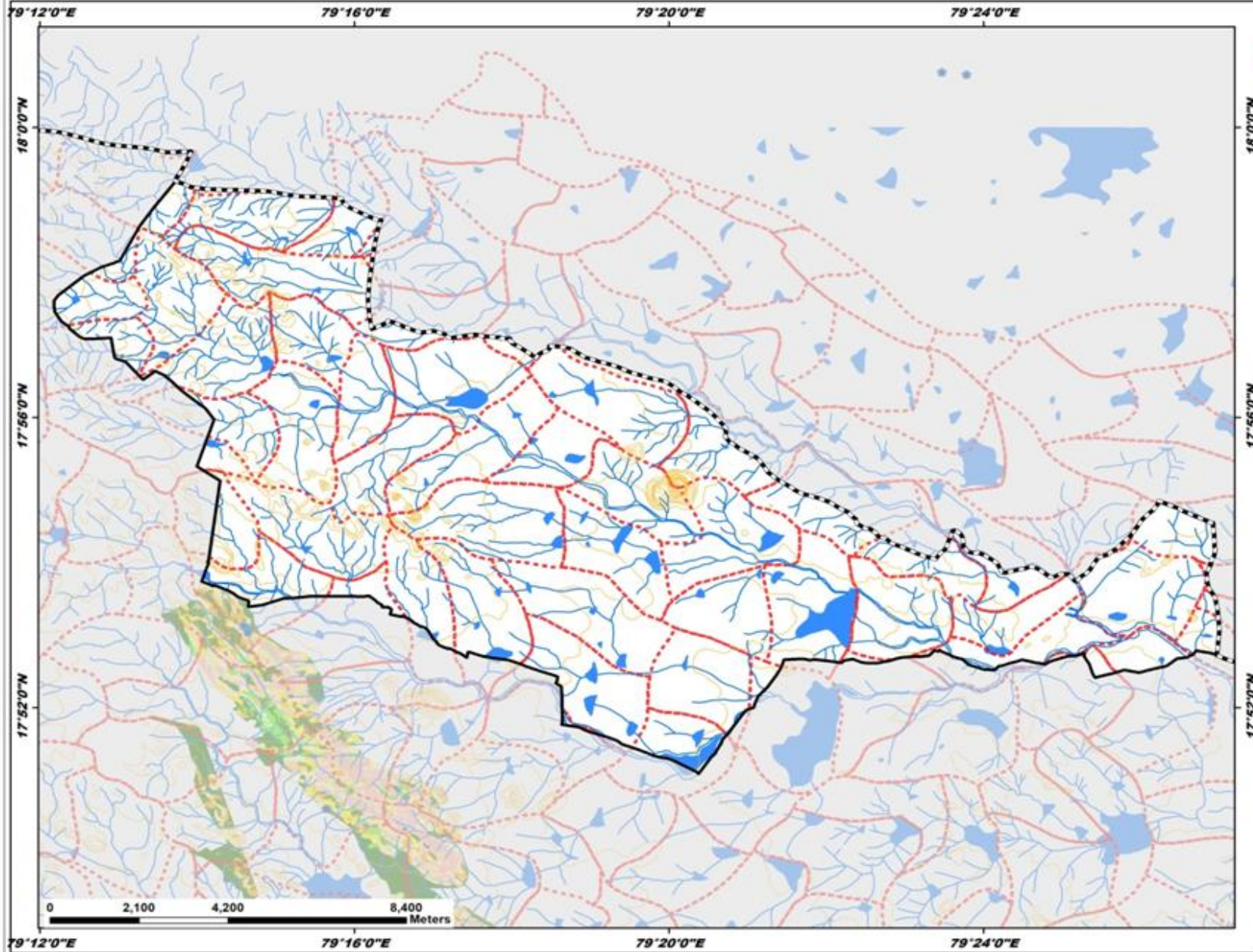
- Streams
- Forest Boundary
- Range Boundary
- Division Boundary



Map Showing Suitability index for Construction of SMC Works of Chilpur Beat



Division : Jangaon
Range : Ghanpur (STN)

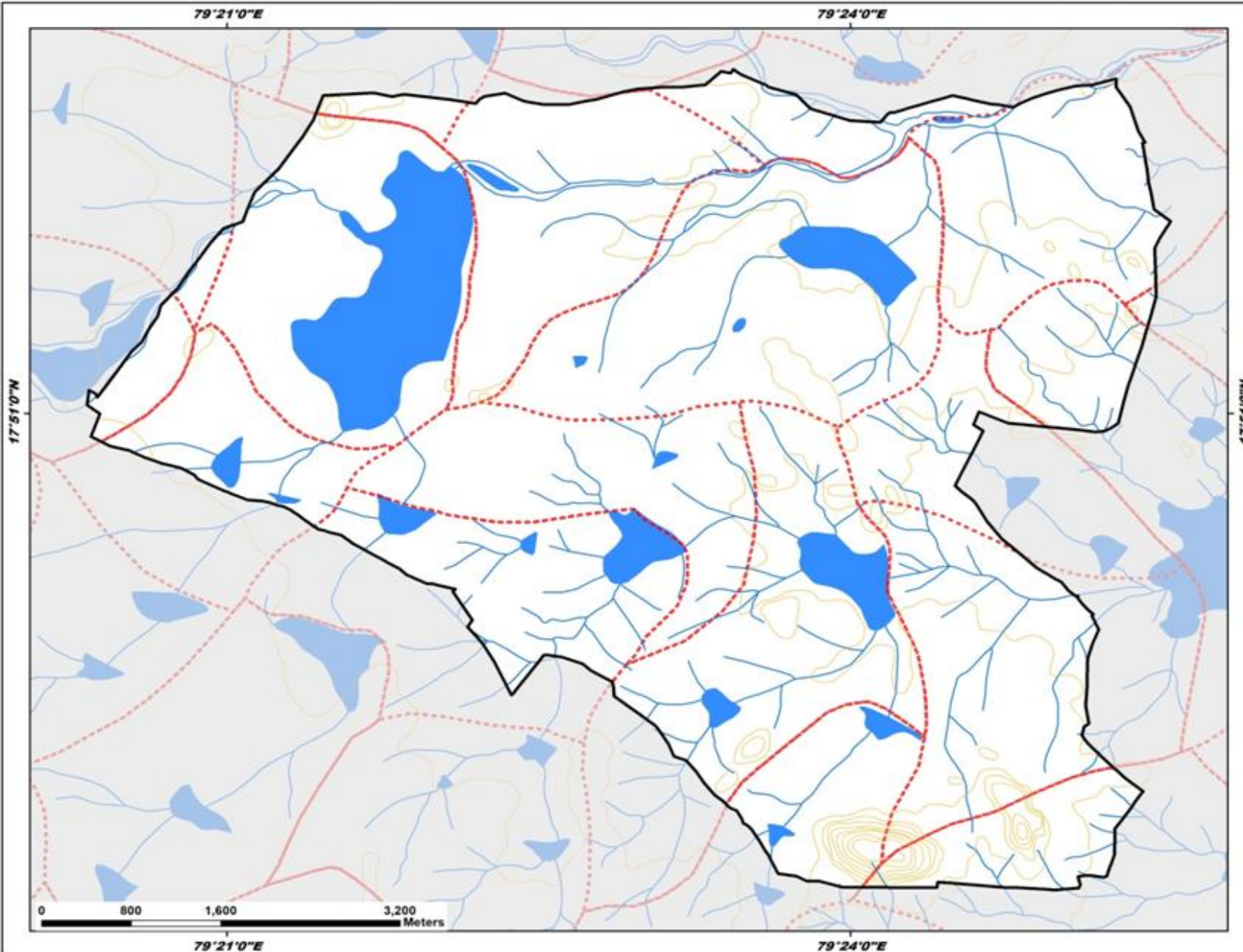


- Legend**
- Proposed_PTs
 - Existing CD/PTs
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
- Suitability Index**
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Ghanpur (STN) Beat



Division : Jangaon
Range : Ghanpur (STN)



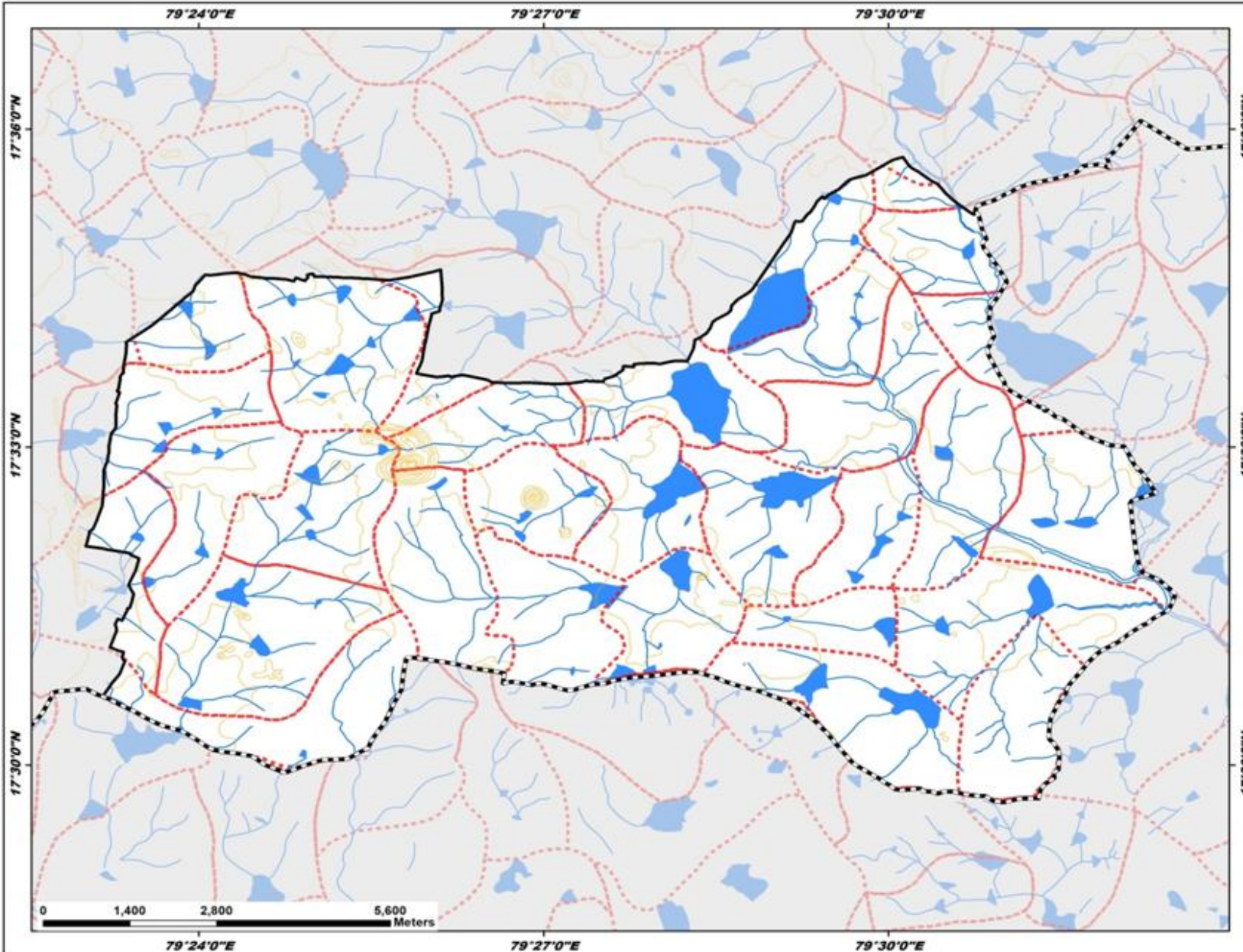
Legend

- Proposed_PT
 - Existing CD/PT
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
- Suitability Index**
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Kodakandla Beat



Division : Jangaon
Range : Ghanpur (STN)



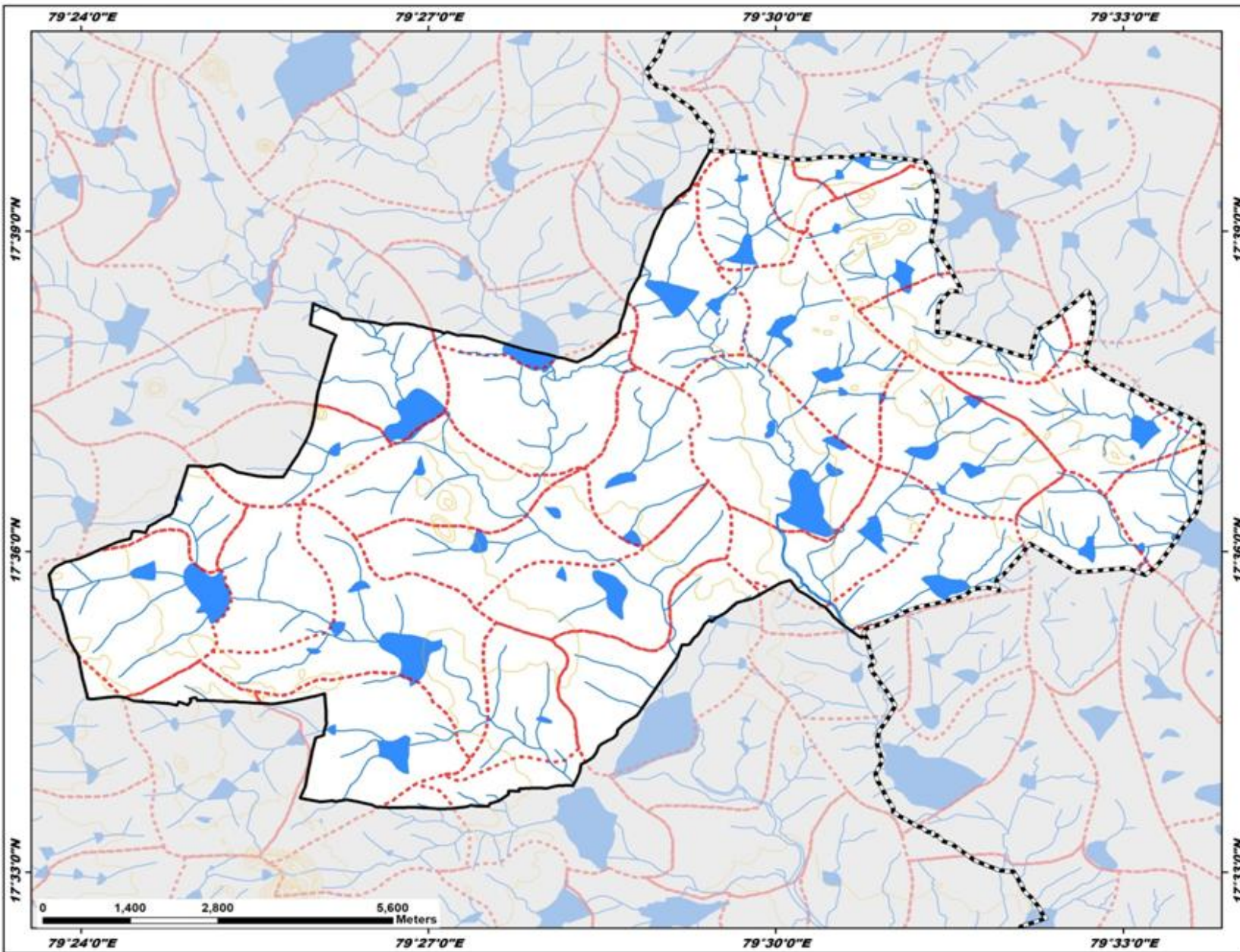
Legend

- Proposed_PT
 - Existing_CD/PT
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
- ### Suitability Index
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Palakurthy Beat



Division : Jangaon
Range : Ghanpur (STN)

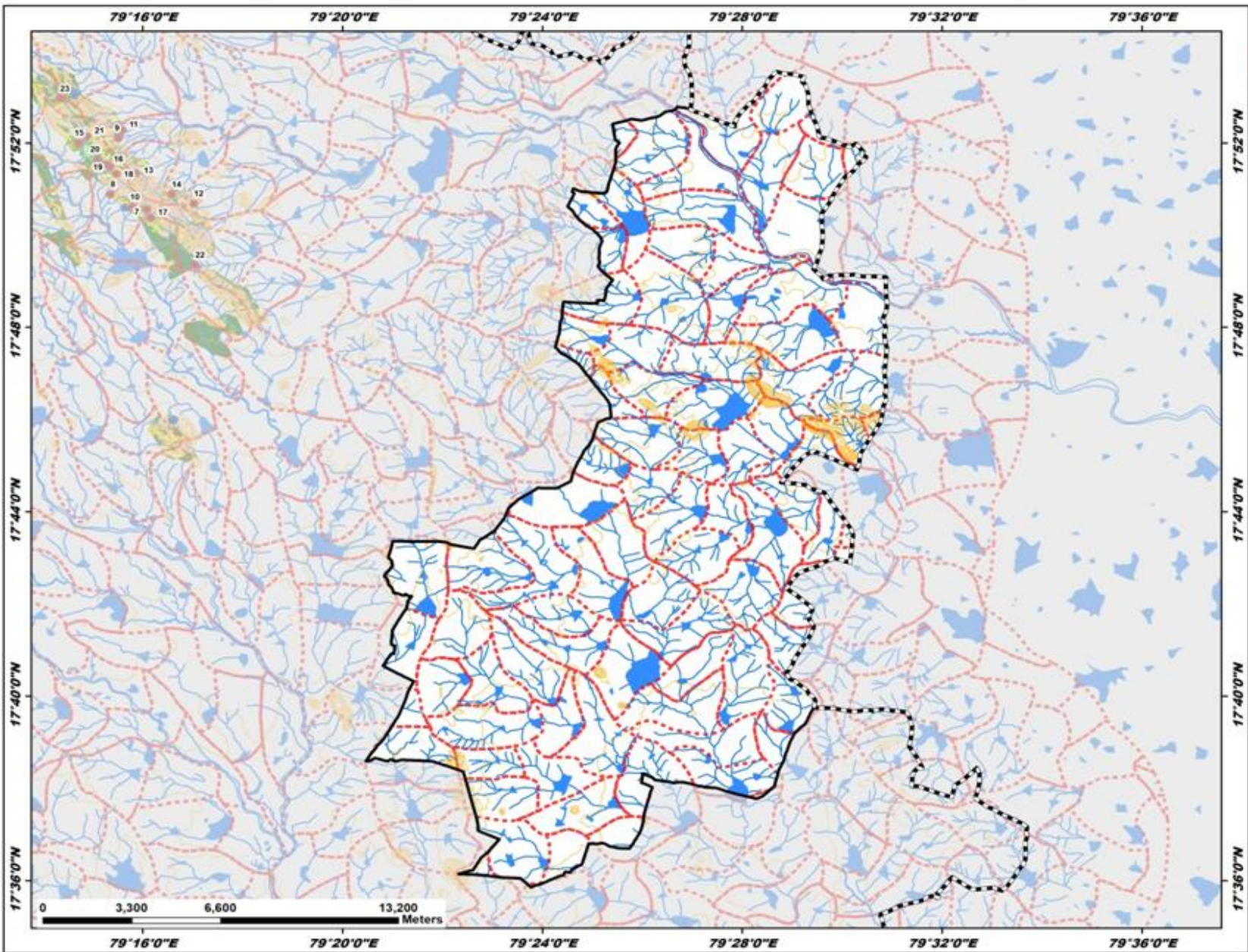


- Legend**
- Proposed_PTs
 - Existing CD/PTs
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
 - Suitability Index**
 - CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Zaffergardh Beat



Division : Jangaon
Range : Ghanpur (STN)



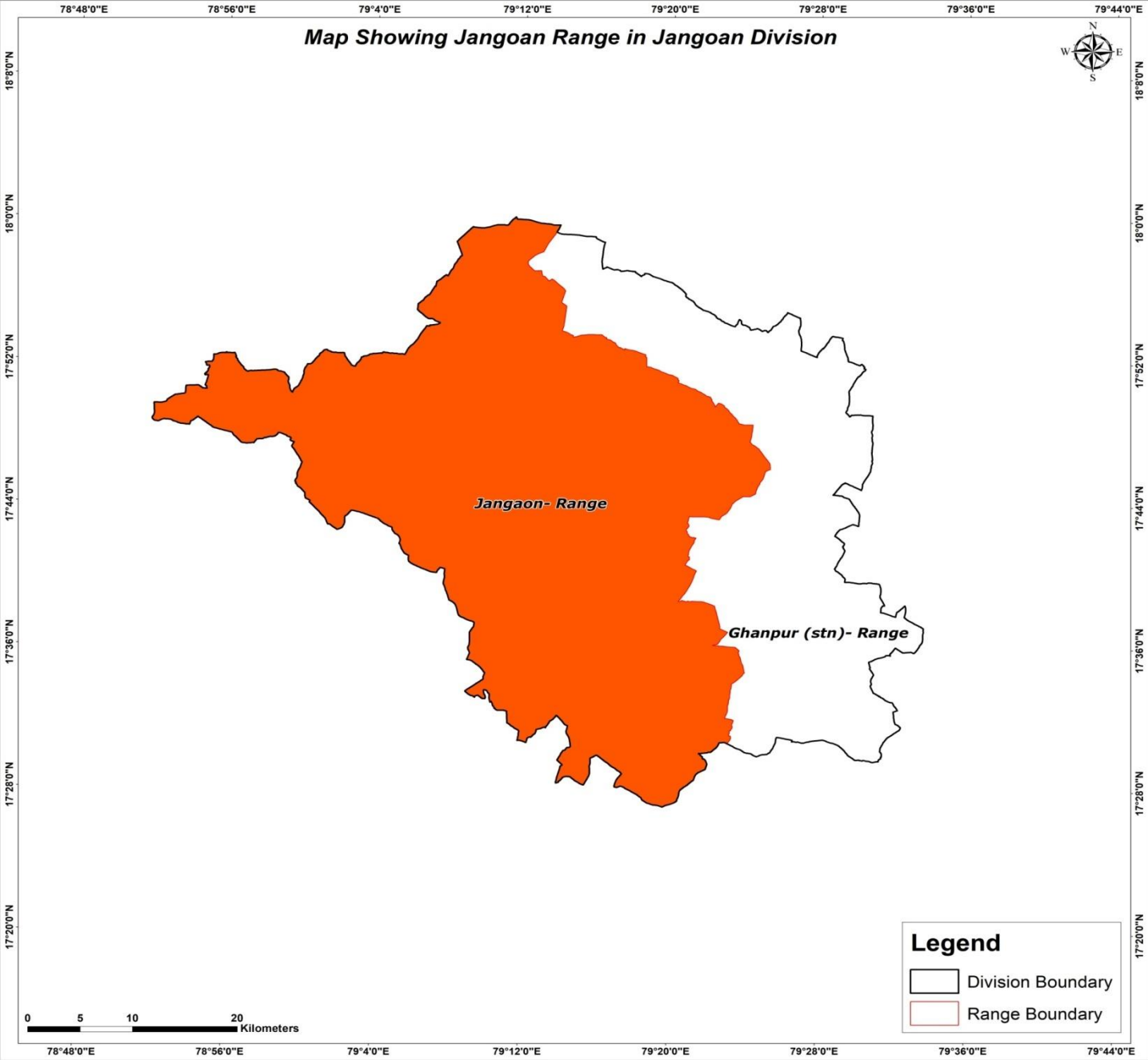
Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- Watershed Boundary
- Compartment Boundary
- Beat Boundary
- Division Boundary

Suitability Index

- CCTs/SCTs - Highly Suitable
- CCTs/SCTs - Moderately Suitable
- CCTs/SCTs - Least Suitable
- PTs - Highly Suitable
- PTs - Moderately Suitable
- PTs - Least Suitable
- MPTs and SGPs - Suitable
- Not Suitable
- Water Body

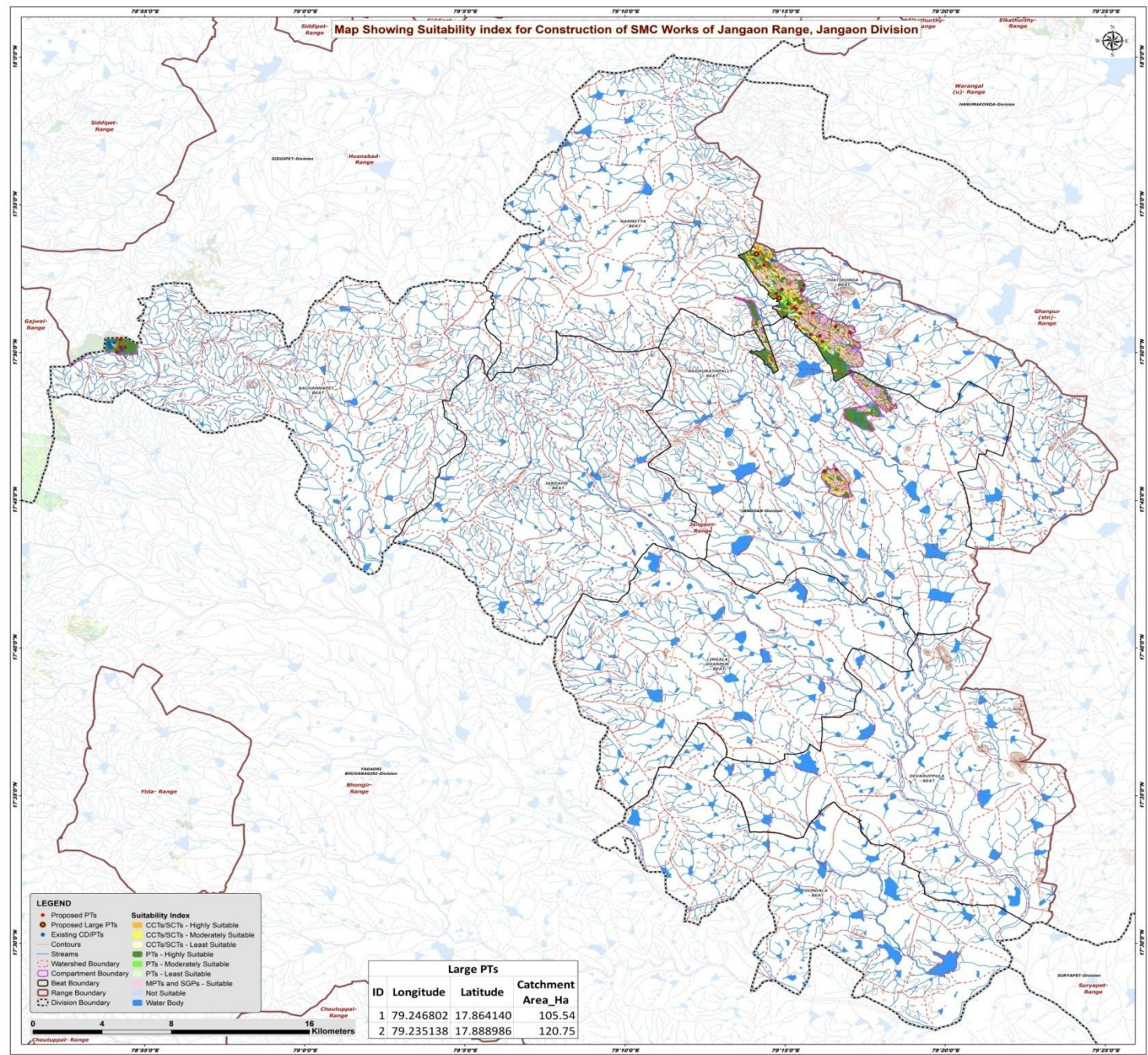
Map Showing Jangaon Range in Jangaon Division



Legend

- Division Boundary
- Range Boundary

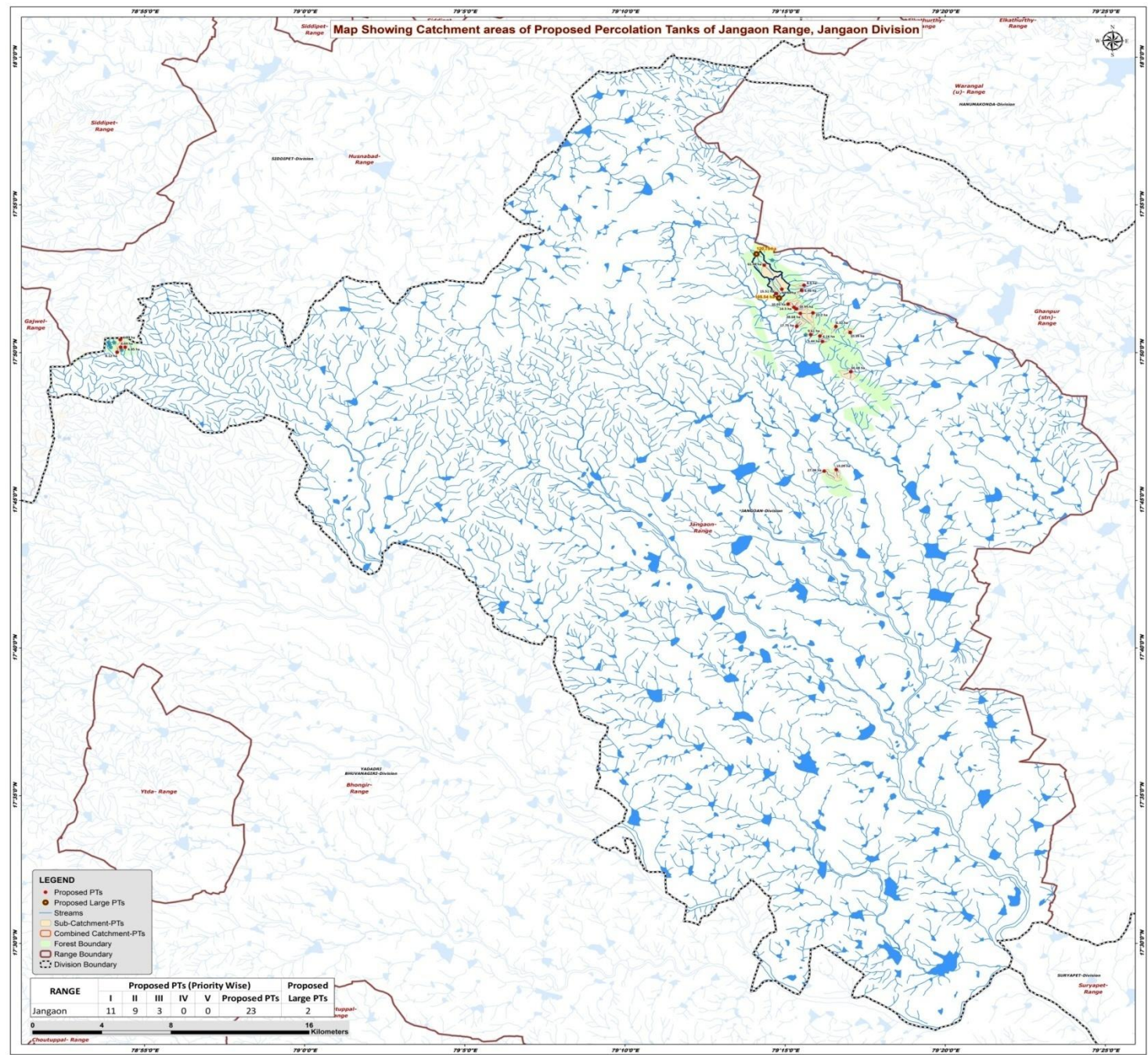
Map Showing Suitability index for Construction of SMC Works of Jangaon Range, Jangaon Division



- LEGEND**
- Proposed PTs
 - Proposed Large PTs
 - Existing CD/PTs
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Range Boundary
 - Division Boundary
- Suitability Index**
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MP/Is and SGP/s - Suitable
 - Not Suitable
 - Water Body

Large PTs			
ID	Longitude	Latitude	Catchment Area_Ha
1	79.246802	17.864140	105.54
2	79.235138	17.888986	120.75

Map Showing Catchment areas of Proposed Percolation Tanks of Jangaon Range, Jangaon Division



- LEGEND**
- Proposed PTs
 - Proposed Large PTs
 - Streams
 - ▭ Sub-Catchment-PTs
 - ▭ Combined Catchment-PTs
 - ▭ Forest Boundary
 - ▭ Range Boundary
 - ▭ Division Boundary

RANGE	Proposed PTs (Priority Wise)					Proposed PTs	Proposed Large PTs
	I	II	III	IV	V		
Jangaon	11	9	3	0	0	23	2



Beat wise Abstract of Proposed PT's – Jangaon Range

S. No.	Beat	Proposed PT's
1	BACHANNAPET	4
2	RAGHUNATHPALLY	2
3	THATIKONDA	17
	Total	23

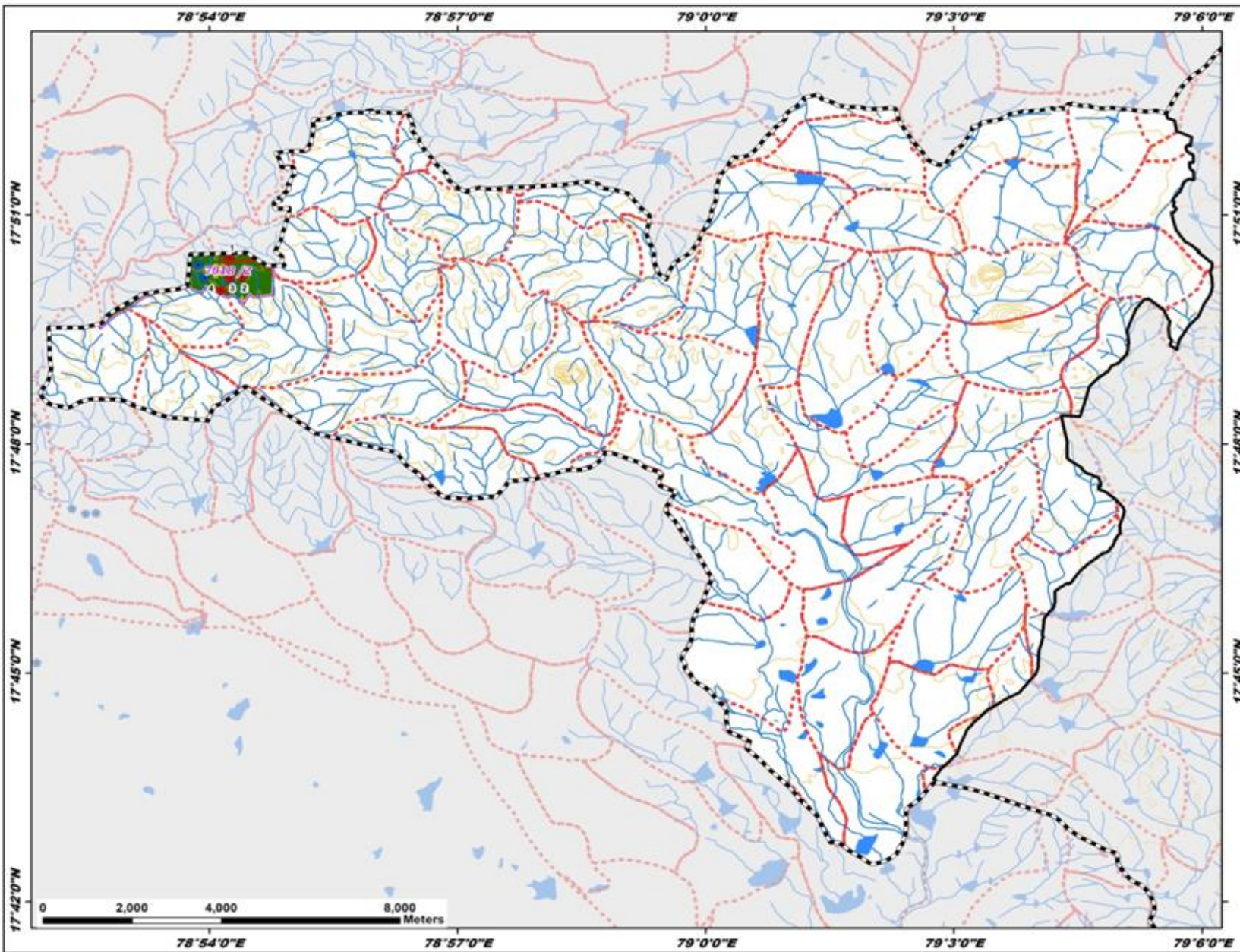
List of Proposed PTs – Jangaon Range

ID	Latitude	Longitude	Catchment Area_Ha	Priority	Beat
1	17.840658	78.904137	6.89	I	BACHANNAPET
2	17.836380	78.906629	6.85	I	BACHANNAPET
3	17.836350	78.904285	6.69	I	BACHANNAPET
4	17.833549	78.902404	8.12	I	BACHANNAPET
5	17.767296	79.276627	13.09	I	RAGHUNATHPALLY
6	17.766459	79.270349	27.06	II	RAGHUNATHPALLY
7	17.842683	79.268154	6.16	I	THATIKONDA
8	17.848143	79.256045	17.75	I	THATIKONDA
9	17.868479	79.258642	6.46	I	THATIKONDA
10	17.843514	79.263329	9.61	I	THATIKONDA
11	17.871386	79.259896	8.90	I	THATIKONDA
12	17.844739	79.283896	10.39	I	THATIKONDA
13	17.855739	79.264529	22.20	II	THATIKONDA
14	17.848098	79.276444	6.32	II	THATIKONDA
15	17.866661	79.245538	15.51	II	THATIKONDA
16	17.858898	79.254632	14.50	II	THATIKONDA
17	17.839636	79.269457	5.44	II	THATIKONDA
18	17.855485	79.257916	28.68	II	THATIKONDA
19	17.858032	79.255958	18.95	II	THATIKONDA
20	17.860721	79.251599	10.03	II	THATIKONDA
21	17.869133	79.248320	44.44	III	THATIKONDA
22	17.822559	79.284278	34.48	III	THATIKONDA
23	17.882681	79.239166	61.48	III	THATIKONDA

Map Showing Suitability index for Construction of SMC Works of Bachannapet Beat



Division : Jangaon
Range : Jangaon



ID	Latitude	Longitude	Catchment Area_Ha	Priority
1	17.840658	78.904137	6.89	1
2	17.836380	78.906629	6.85	1
3	17.836350	78.904285	6.69	1
4	17.833549	78.902404	8.12	1

Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- ⋯ Watershed Boundary
- ⋯ Compartment Boundary
- ▬ Beat Boundary
- ⋯ Division Boundary

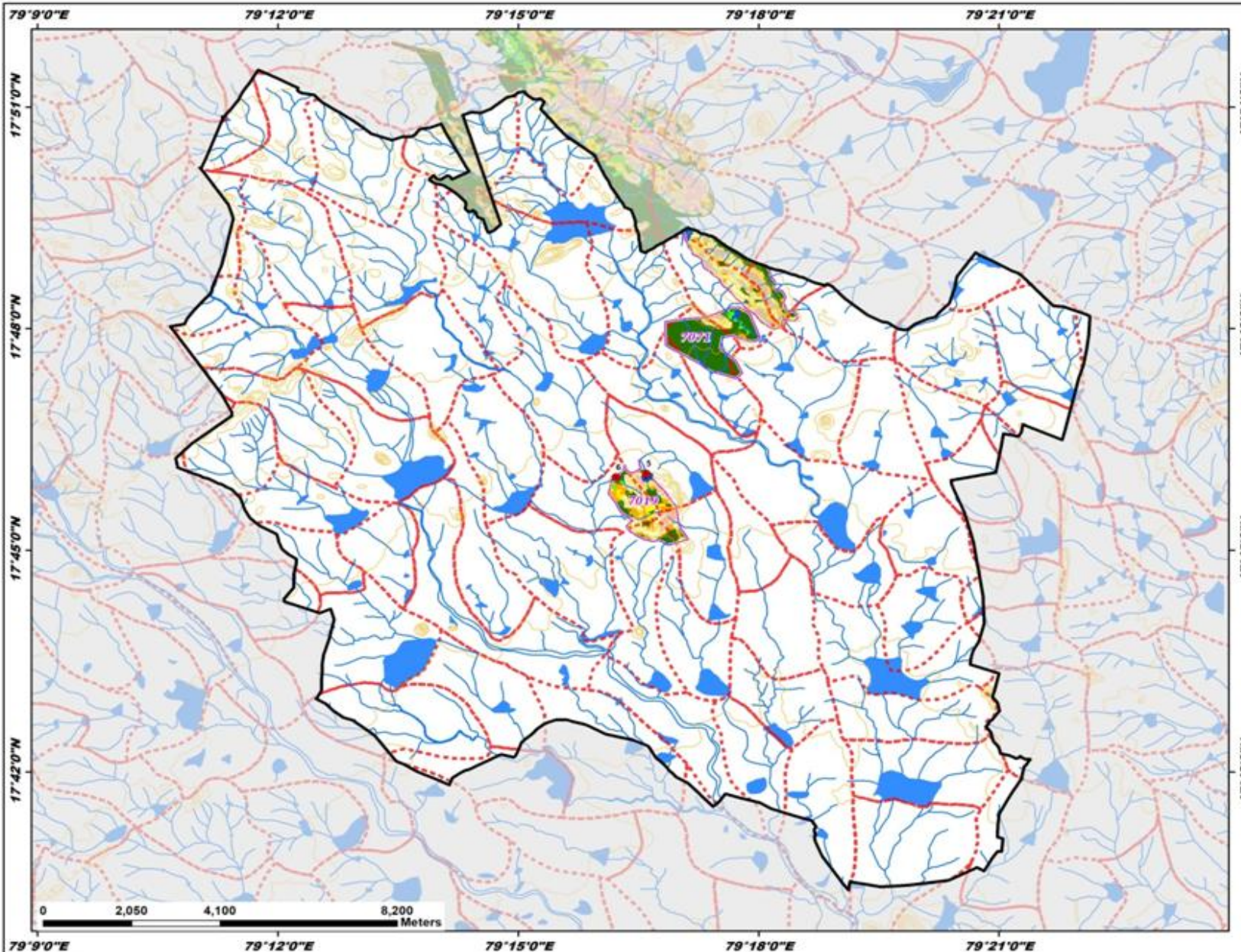
Suitability Index

- CCTs/SCTs - Highly Suitable
- CCTs/SCTs - Moderately Suitable
- CCTs/SCTs - Least Suitable
- PTs - Highly Suitable
- PTs - Moderately Suitable
- PTs - Least Suitable
- MPTs and SGPs - Suitable
- Not Suitable
- Water Body

Map Showing Suitability index for Construction of SMC Works of Raghunathpally Beat



Division : Jangaon
Range : Jangaon



ID	Latitude	Longitude	Catchment Area_Ha	Priority
5	17.767296	79.276627	13.09	I
6	17.766459	79.270349	27.06	II

Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- - - Watershed Boundary
- - - Compartment Boundary
- ▭ Beat Boundary
- - - Division Boundary

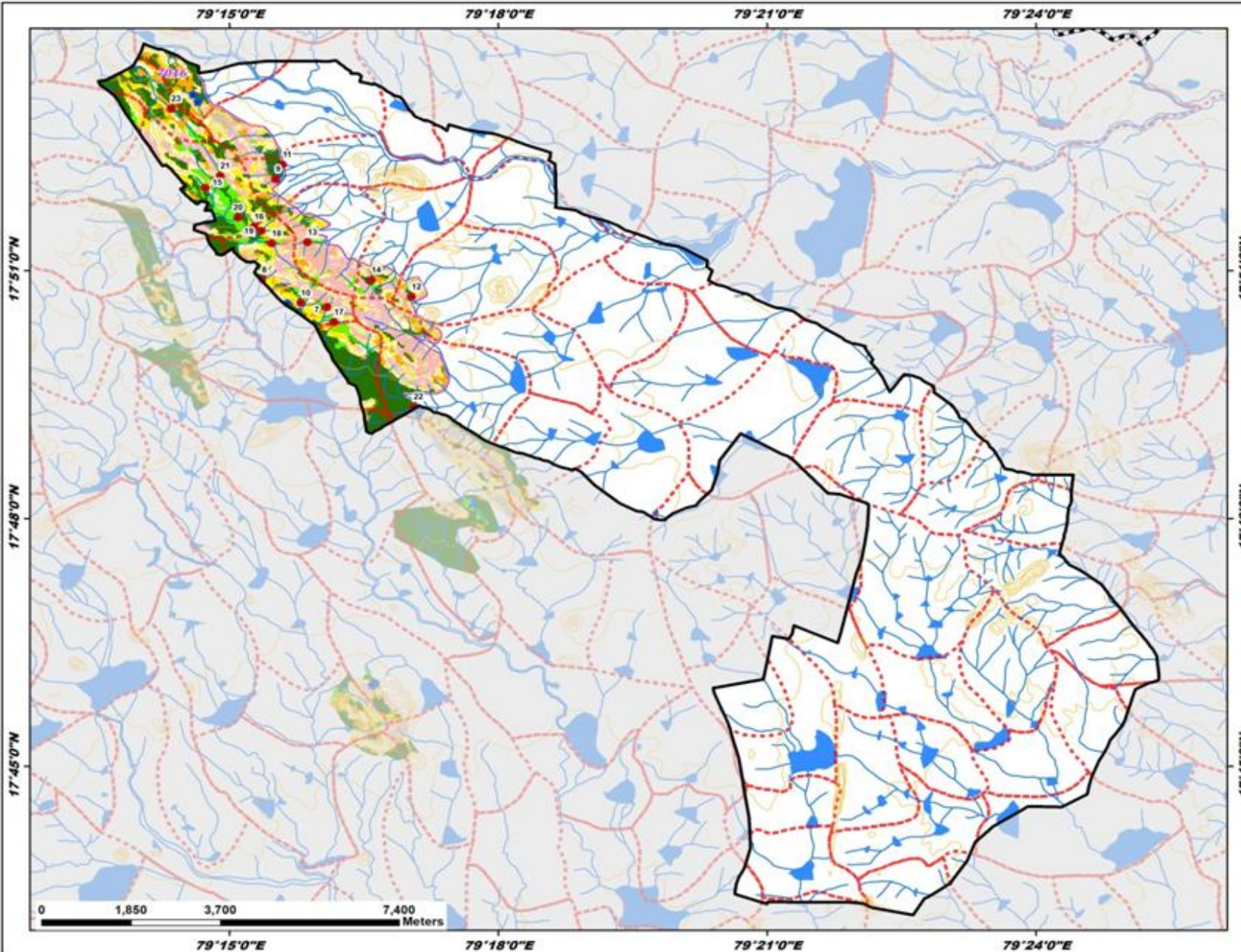
Suitability Index

- CCTs/SCTs - Highly Suitable
- CCTs/SCTs - Moderately Suitable
- CCTs/SCTs - Least Suitable
- PTs - Highly Suitable
- PTs - Moderately Suitable
- PTs - Least Suitable
- MPTs and SGPs - Suitable
- Not Suitable
- Water Body

Map Showing Suitability index for Construction of SMC Works of Thatikonda Beat



Division : Jangaon
Range : Jangaon



ID	Latitude	Longitude	Catchment Area_Ha	Priority
7	17.842683	79.268154	6.16	I
8	17.848143	79.256045	17.75	I
9	17.868479	79.258642	6.46	I
10	17.843514	79.263329	9.61	I
11	17.871386	79.259896	8.90	I
12	17.844739	79.283896	10.39	I
13	17.855739	79.264529	22.20	II
14	17.848098	79.276444	6.32	II
15	17.866661	79.245538	15.51	II
16	17.858898	79.254632	14.50	II
17	17.839636	79.269457	5.44	II
18	17.855485	79.257916	28.68	II
19	17.858032	79.255958	18.95	II
20	17.860721	79.251599	10.03	II
21	17.869133	79.248320	44.44	III
22	17.822559	79.284278	34.48	III
23	17.882681	79.239166	61.48	III

Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- Watershed Boundary
- Compartment Boundary
- Beat Boundary
- Division Boundary

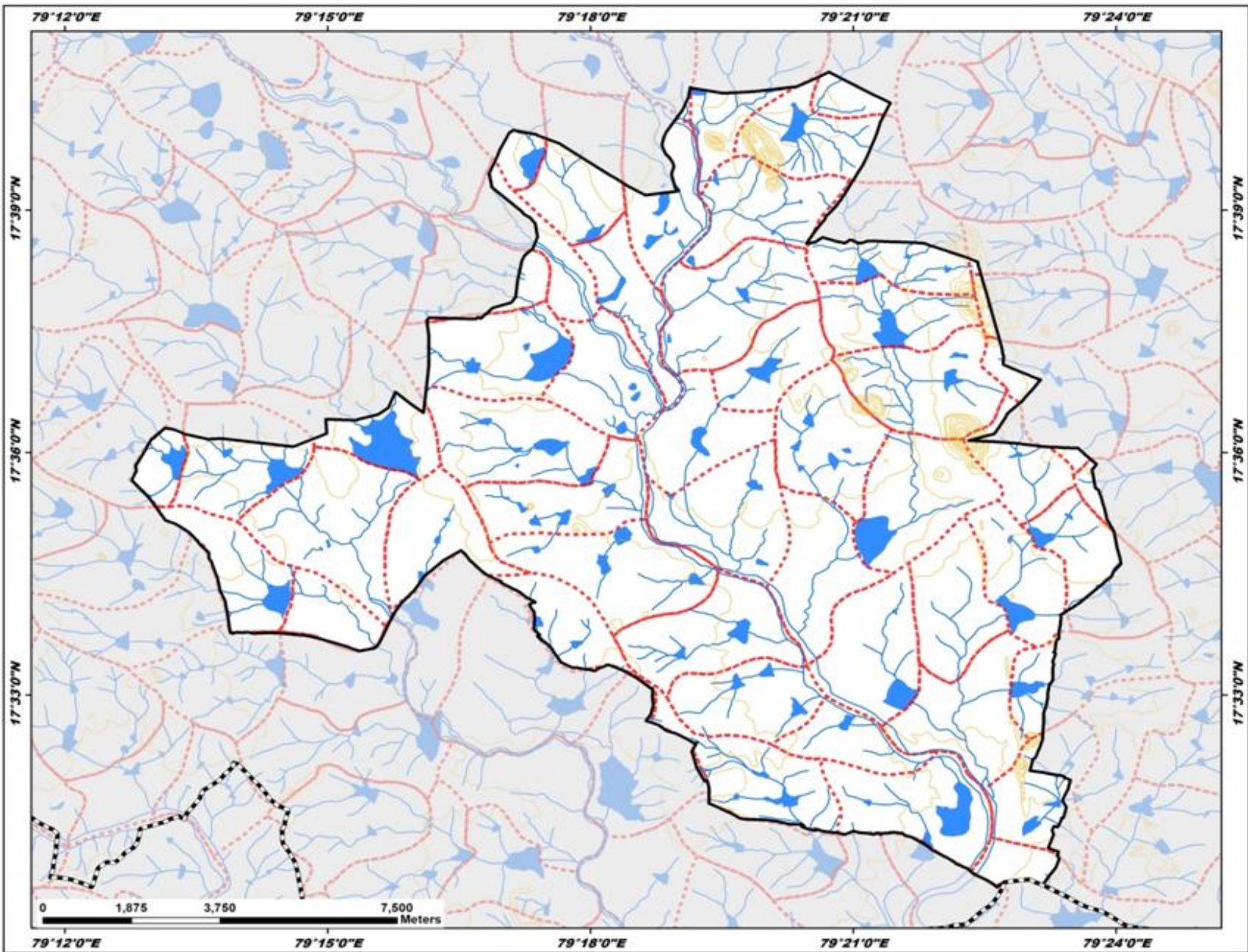
Suitability Index

- Orange: CCTs/SCTs - Highly Suitable
- Yellow: CCTs/SCTs - Moderately Suitable
- Light Green: CCTs/SCTs - Least Suitable
- Dark Green: PTs - Highly Suitable
- Light Green: PTs - Moderately Suitable
- Light Green: PTs - Least Suitable
- Pink: MPTs and SGPs - Suitable
- Light Blue: Not Suitable
- Blue: Water Body

Map Showing Suitability index for Construction of SMC Works of Devaruppla Beat



Division : Jangaon
Range : Jangaon

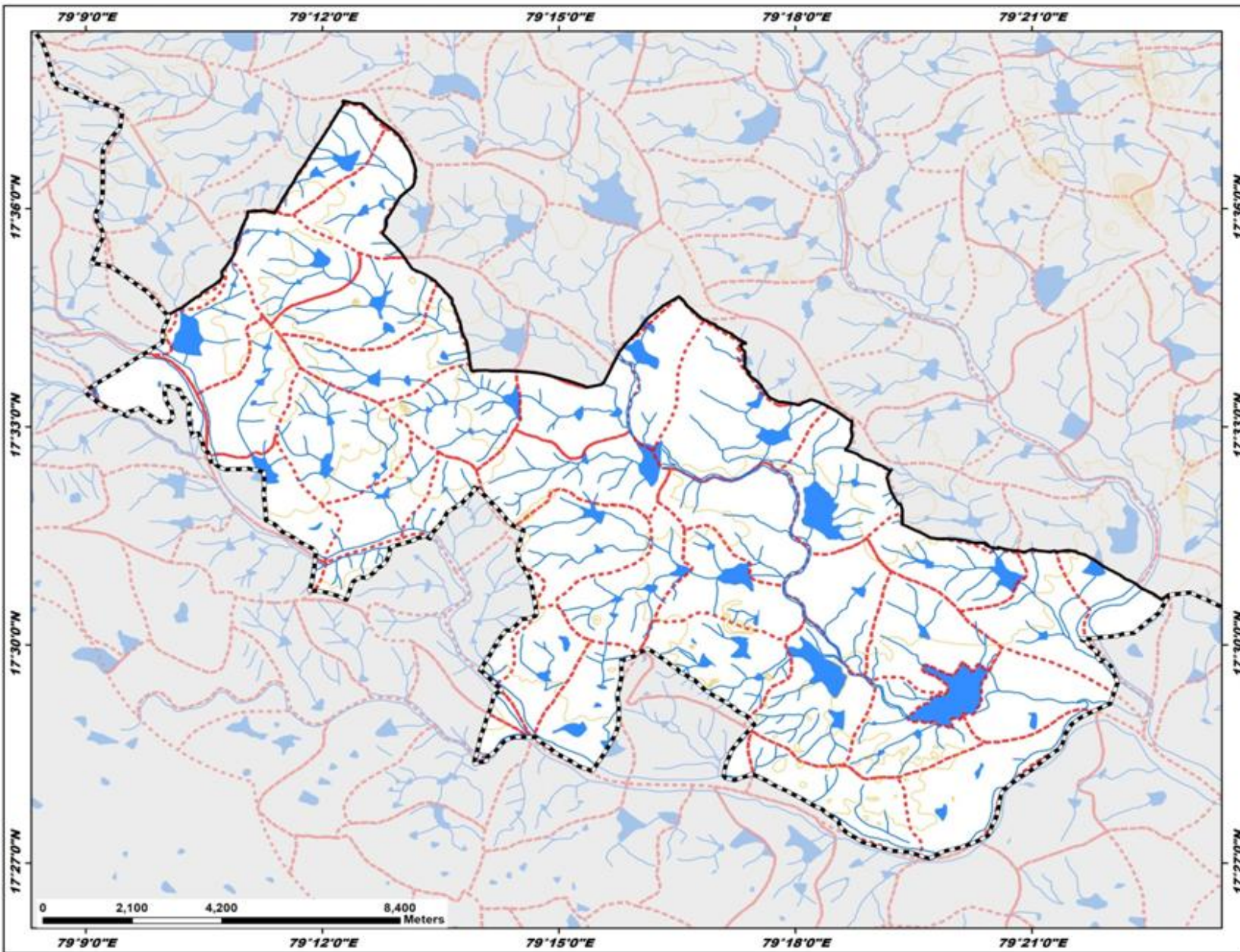


- Legend**
- Proposed_PTs
 - Existing CD/PTs
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
- Suitability Index**
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Gundala Beat



Division : Jangaon
Range : Jangaon

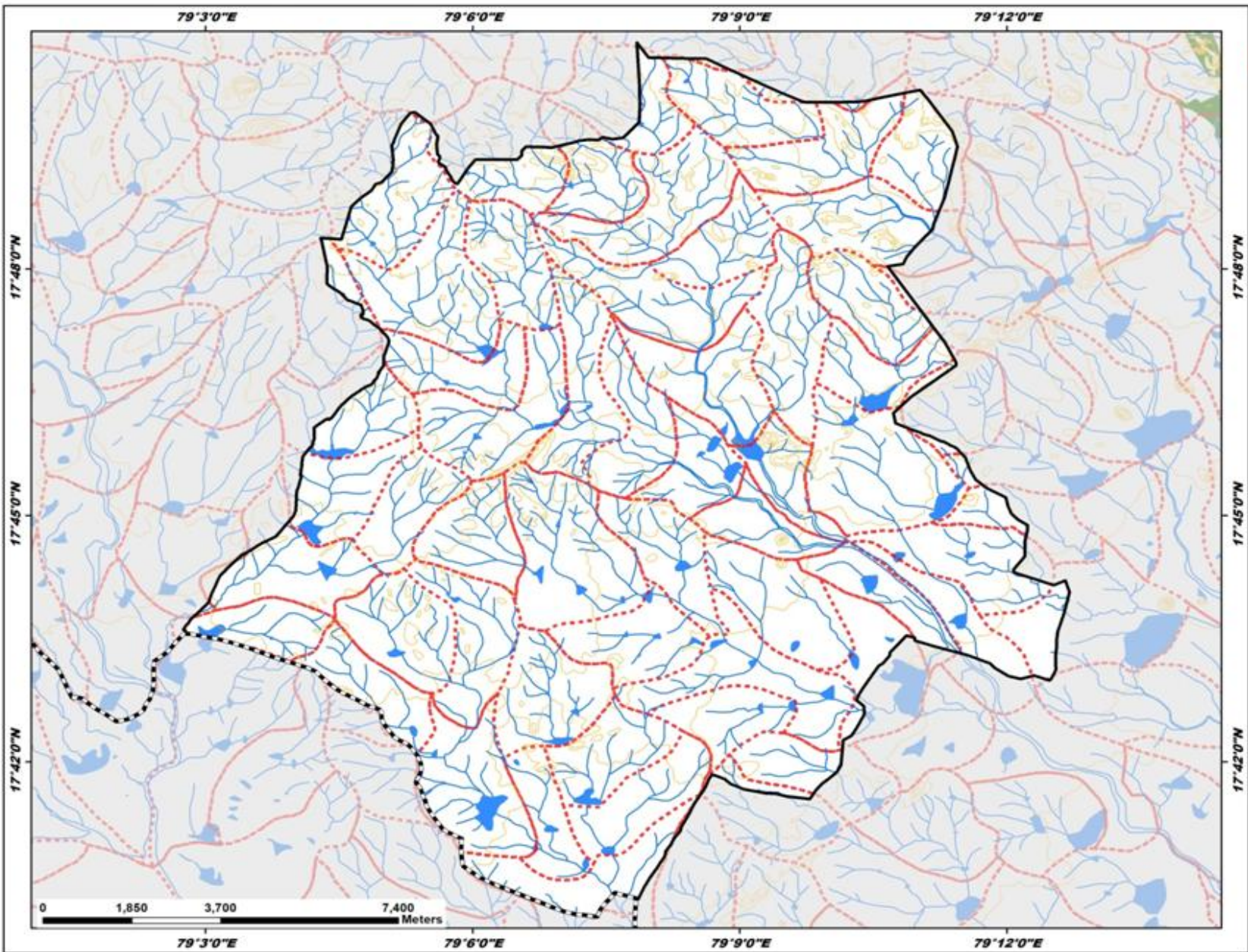


- Legend**
- Proposed_PT
 - Existing CD/PT
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
- Suitability Index**
- CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

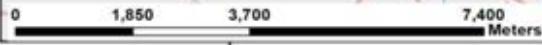
Map Showing Suitability index for Construction of SMC Works of Jangaon Beat



Division : Jangaon
Range : Jangaon



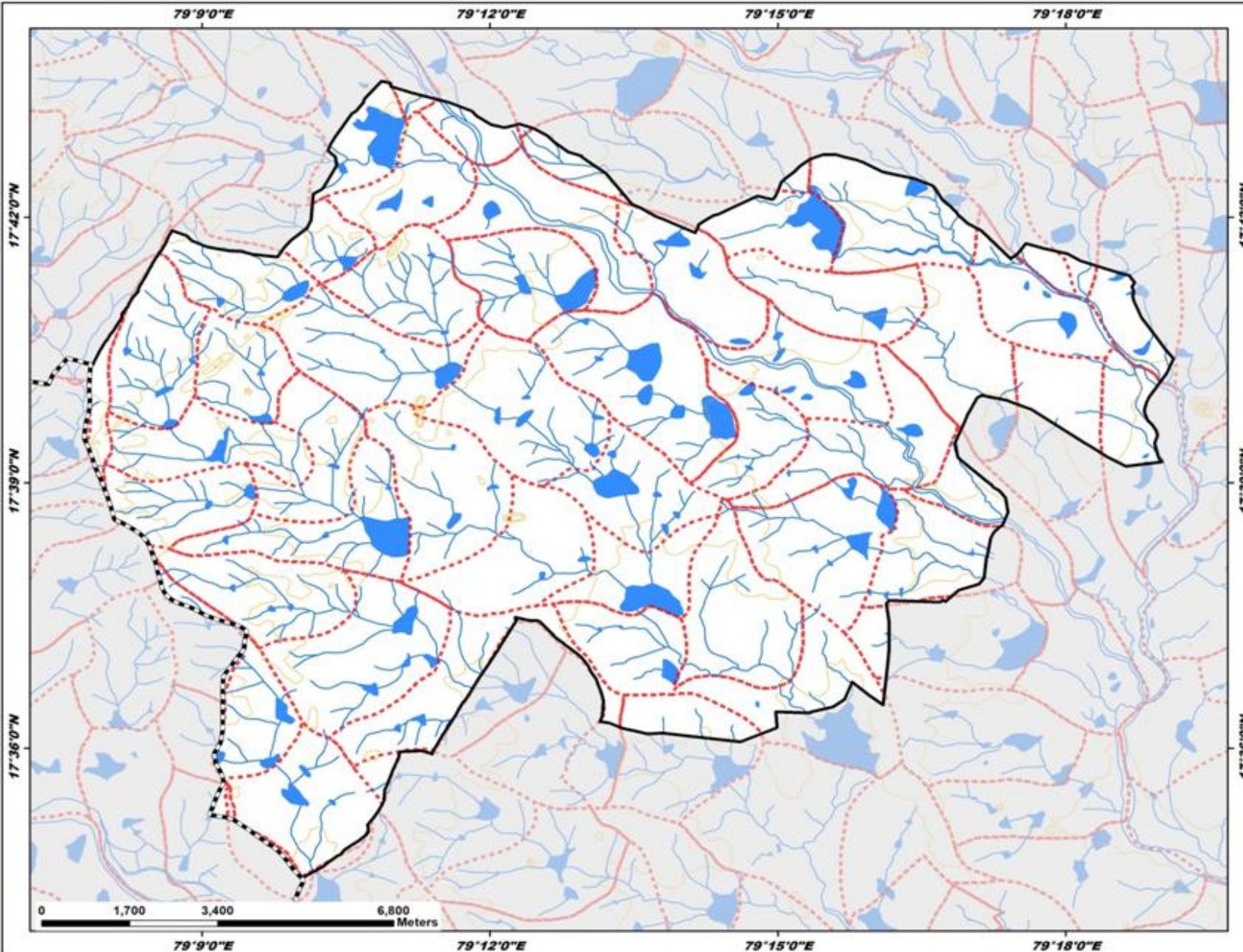
- Legend**
- Proposed_PT
 - Existing CD/PT
 - Contours
 - Streams
 - Watershed Boundary
 - Compartment Boundary
 - Beat Boundary
 - Division Boundary
 - Suitability Index**
 - CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body



Map Showing Suitability index for Construction of SMC Works of Lingala Ghanpur Beat



Division : Jangaon
Range : Jangaon



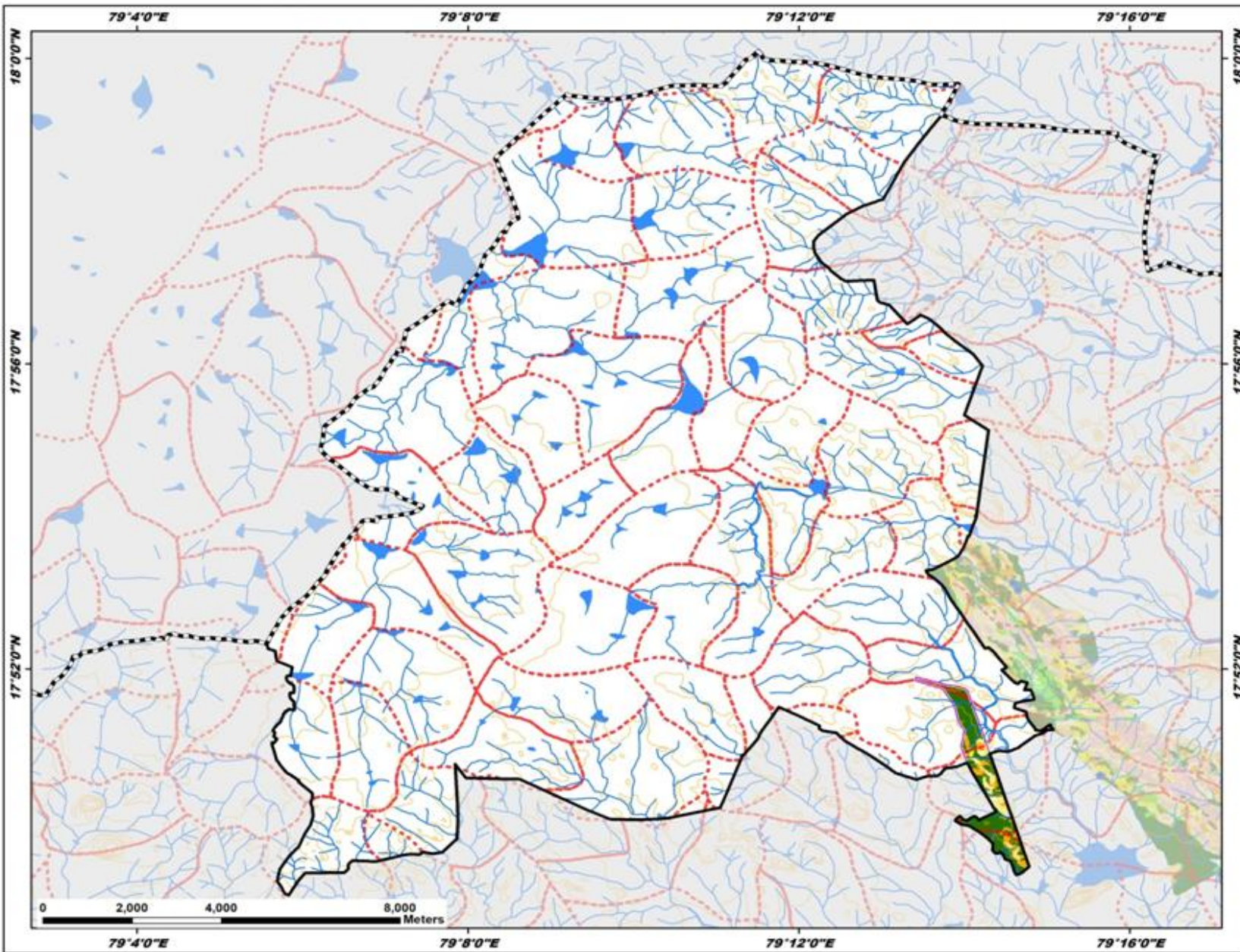
Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- Watershed Boundary
- Compartment Boundary
- Beat Boundary
- Division Boundary
- Suitability Index**
 - CCTs/SCTs - Highly Suitable
 - CCTs/SCTs - Moderately Suitable
 - CCTs/SCTs - Least Suitable
 - PTs - Highly Suitable
 - PTs - Moderately Suitable
 - PTs - Least Suitable
 - MPTs and SGPs - Suitable
 - Not Suitable
 - Water Body

Map Showing Suitability index for Construction of SMC Works of Narmetta Beat



Division : Jangaon
Range : Jangaon



Legend

- Proposed_PTs
- Existing CD/PTs
- Contours
- Streams
- - - Watershed Boundary
- - - Compartment Boundary
- ▭ Beat Boundary
- - - Division Boundary

Suitability Index

- CCTs/SCTs - Highly Suitable
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