







Ministry of Climate Change Government of Pakistan

FOREST COVER ATLAS OF PAKISTAN





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PAKISTAN

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Farhat Jabeen





FOREST COVER ATLAS OF PAKISTAN

Dry Deciduous Forest

Alpine Scrub Forest

THE FALLEN PANDAS

RAFIULLAH SWATI Budding professional and

conservationist from early years

With a degree in forestry, Rafiullah joined WWF-Pakistan as an intern, like many of his team members. His passion for forestry was unlike others as he had grown up watching his father working in the same field and protecting forests. Already the team leader of the Hazara team of the National Forest Inventory under the REDD+ project, Rafiullah was highly ambitious by nature and aspired to become an expert

AAMIR SAEED KHAN A passionate environmentalist and loving father

Originally hailing from Kohat, Aamir had over 25 years of experience in conducting forest surveys and implementing community-based conservation projects. Aamir was a technical expert in his field and started his career in WWF working in the Salt Range for a decade. He held two Master's degrees, in organic chemistry and forestry from the Pakistan Forest Institute, and was passionate about the protection of natural resources. Known to all for his kind heart and charitable nature. Aamir was a committed disaster relief volunteer, having spent hours in the field to help communities recover and rebuild after the earthquake of 2005 and the floods of 2010. He leaves behind a wife, and three sons, aged 8, 15 and 21.

IFTIKHAR HUSSAIN Nature enthusiast and loyal friend

Iftikhar had been a part of the Panda family since his internship days at the Chitral field office. A true nature enthusiast, Iftikhar held a Bachelor of Science degree in environmental sciences and had helped the organization with many challenging projects, including work on snow leopards, lbex, and Markhors. He worked with the staff in WWF-Sweden who remembered him fondly and are shocked at his passing. His dedication towards his work, charismatic personality and humble nature made everyone warm up to him instantly, be it his colleagues, project partners, or the community members he worked with. Iftikhar leaves behind a young, grieving widow and his beloved mother.







ATIF ALI KHAN Future leader, beloved father and son

Anyone who knew Atif knew he had a bright future ahead of him. Well-organized, talented, and professional, Atif was a gold medalist with an MPhil degree in forestry and rangeland management and was towards the end of completing his PhD degree. He joined the Panda family as an intern and quickly gained confidence and respect within the teams. exhibiting a level of intellect and wisdom unparalleled by his peers. He leaves behind grieving parents, siblings, and









FARHAN ULLAH AFRIDI Dedicated, diligent and expectant father

Farhan demonstrated maturity and seriousness towards his duty as a driver. He was also fond of nature and so enioved working on WWF assignments as they gave him a chance to explore new areas and be close to nature. Coming from an extremely marginalized background, he could not complete his education. However, he worked hard to provide for his family and despite his young age, was revered for his professionalism and work ethic.

He is survived by aged parents and a young, pregnant wife.



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Ministry appreciates the work of WWF-Pakistan's GIS Lab and Forest Inventory team in generating the National and Sub-national Forest Cover Atlases under the supervision of the Ministry of Climate Change's National REDD+ Office. Ministy also recognize and honor the sacrifice of lives by five WWF-Pakistan's field team members AAMIR SAEED KHAN, IFTIKHAR HUSSAIN, ATIF ALI KHAN, RAFIULLAH SWATI and FARHAN ULLAH AFRIDI who lost their lives in the course of duty while collecting Forest Inventory data as a consequence of a fatal car accident.

Disclaimer:

The administrative boundary data is based on UNOCHA compiled by WWF-Pakistan and do not necessarily match with the national map published by SoP. The international boundary in Jammu and Kashmir hregion do not whatsoever represent the actual boundary. The accession of Jammu and Kashmir remains to be decided.



GENERAL FOREST SITUATION

Pakistan is mainly a dry land country with 80 percent of its land in arid and semiarid areas. Land Use Change Assessment plays important role in understanding and resolving various environment related issues especially related to the drivers of deforestation and forest degradation. The data generated from satellite images are good source in studying economic impacts of periodic land use changes and productivity, as well as habitat and biodiversity loss, climate variability and other environmental factors. Time Series Analysis from satellite images are therefore considered a more reliable and accurate mean of monitoring and measurements forests and changes to other land uses as compared to traditional methods. The Forest Cover Atlas gives an overall picture of existing forest cover on National and sub-national level. It shows the information on forest cover changes over a period of four years (2016-2020). The information is supported with tables, maps, graphs and charts of Forest cover and other land use / land cover classes.

The study revealed that the area of Forest Cover of the country increased from 4,005,180 (4.56%) of the total area (87,910,600 ha) of Pakistan including AJ&K and GB to 4,113,657 (4.68%) hectares from the year 2016 to 2020. This increase of 1,08,477 hectares in country's forest cover is result of extensive tree plantations initiatives at the federal and provincial levels to reduce deforestation and enhance national tree cover such as, Billion Tree Afforestation Project launched in 2015 by Khyber Pakhtunkhwa Province and large-scale mangrove restoration along the coast by Sindh Province. According to this study, the overall deforestation in Pakistan for the reference years 2016–2020 was 44,028.5 hectares, with an average annual rate of 11,007.1 hectares.

Forest Area and Carbon Stock (Period:2016-2020)							
	2016	2020	n 2021)				
Forest Stratification	Area (ha)	Area (ha)	C Density (tC/ha)	Carbon Stock (MtC)			
Sub-Alpine	97,945	102,320	66.22	6.78			
Dry Temperate	1,031,503	1,057,651	101.57	107.42			
Dry temperate Juniper and Chilghoza Forests	225,996	228,193	65.87	15.03			
Moist Temperate	550,303	556,525	120.92	67.29			
Sub-tropical Chir Pine	633,983	639,786	89.15	57.03			
Subtropical broad leaved (Scrub)	999,776	1,025,130	57.01	58.44			
Riverine Forests	117,872	112,878	42.20	4.77			
Tropical thorn	103,333	116,017	35.24	4.09			
Mangrove Forests	133,816	157,357	238.85	37.59			
Irrigated Plantation	60,672	66,774	69.05	4.61			
Farm Plantation (Gilgit Only)	49,981	51,026	56.35	2.88			
Total	4,005,180	4,113,657	86	366			
%age	4.56	4.68					

Emissions and Removals from Deforestation and Enhancement (period: 2016-2020)								
Forest Stratification	Total Deforestation	Total Emissions	Forest enhancement	Removals (A)	Net emissions/			
	(ha)	(Mt CO2e)	LUChange (A) (ha)	(Mt CO2e)	removals (Mt CO2e)			
Sub-Alpine	744.7	0.104	4,872.1	0.054	0.051			
Dry Temperate	3,674.5	0.688	18,139.0	0.162	0.527			
Dry temperate Juniper and Chilghoza Forests	294.8	0.037	281.5	0.002	0.035			
Moist Temperate	959.9	0.235	4,462.8	0.068	0.167			
Sub-tropical Chir Pine	2,332.6	0.326	4,572.8	0.053	0.274			
Subtropical broad leaved (Scrub)	5,398.5	0.160	6,981.4	0.046	0.114			
Riverine Forests	25,989.0	0.357	27,945.0	0.177	0.180			
Tropical thorn	3,914.5	0.078	18,783.0	0.039	0.038			
Mangrove Forests	720.0	0.039	30,193.2	0.963	-0.924			
Total	44,028.5	2.024	116,230.7	1.563	0.461			
Annual (2016-2020)	11,007.1	0.51	29,057.7	0.39	0.12			

Emissions and Removals from Forest Degradation and Improvement in forest cover density									
(2016-2020)									
Forest Stratification	Total Degradation	Total Emissions	Enhancement in forest cover	Removals (B)	Net Emissions / Removals (Mt				
	(ha)	(Mt CO2e)	density (B) (ha)	(Mt CO2e)	CO2e)				
Sub-Alpine	18,706	1.744	4,352	0.413	1.277				
Dry Temperate	182,691	19.937	133,673	18.253	1.738				
Dry temperate Juniper and Chilghoza Forests	55,884	3.480	7,997	0.561	2.927				
Moist Temperate	107,928	12.297	35,929	5.319	6.987				
Sub-tropical Chir Pine	117,516	6.818	40,674	2.171	4.616				
Subtropical broad leaved (Scrub)	119,662	4.293	125,237	3.133	1.202				
Riverine Forests	12,276	0.121	11,243	0.067	0.054				
Tropical thorn	11,898	0.318	16,112	0.397	-0.086				
Mangrove Forests	4,270	0.060	34,539	0.410	-0.340				
Total	630,831	49.068	409,756	30.724	18.375				
Annual (2016-2020)	157,708	12.267	102,439	7.681	4.594				

Overall Emissions and Removals from forests (2016-2020)								
Forest Stratification	Emissions from deforestation (Mt CO2e)	eforestation forest degradation enhancements		Removals from Enhancements (B) (Mt CO2e)	Overall Net Emissions/ Removals (Mt CO2e)			
Sub-Alpine	0.105	1.709	0.053	0.413	1.348			
Dry Temperate	0.687	19.982	0.161	18.253	2.254			
Dry temperate Juniper and Chilghoza Forests	0.036	3.493	0.002	0.564	2.963			
Moist Temperate	0.234	12.307	0.068	5.319	7.155			
Sub-tropical Chir Pine	0.326	6.787	0.053	2.171	4.890			
Subtropical broad leaved (Scrub)	0.164	4.334	0.048	3.136	1.315			
Riverine Forests	0.357	0.124	0.177	0.066	0.239			
Tropical thorn	0.078	0.319	0.040	0.401	-0.043			
Mangrove Forests	0.039	0.069	0.963	0.410	-1.264			
Total	2.026	49.124	1.566	30.732	18.855			
Annual	0.507	12.281	0.391	7.683	4.714			

STANDARDS & METHODOLOGY

Province wise Satellite based Land / Use Land cover, mainly focused on forests, of Pakistan was developed using Mid-resolution Remote Sensing Satellite (Landsat 8) cloud free data for the reference year of 2016 and 2020. Free and Open Source Software (FOSS) including OpenForis Collect Earth and QGIS were utilized to generate activity data (AD). A Non-parametric regression model such as Random Forest was used to classify the satellite imagery into IPCC's six LULC classes. The standard and harmonised definitions of forest, deforestation, forest degradation, and other IPCC land use categories (cropland, grassland, settlement, wetland and other land) used in creating the Activity Data (AD) are as follows.

Forest:

"A minimum area of land of 0.5 ha with a tree crown cover of more than 10 % comprising trees with the potential to reach a minimum height of 2 meters. This will also include existing irrigated plantations as well as areas that have already been defined as Forests in respective legal documents and expected to meet the required thresholds as defined in the national Forest definition of Pakistan."

Cropland:

This category includes arable and tillage land, and agro-Forestry systems where vegetation falls below the thresholds used for the Forest Land category, consistent with the selection of national definitions.

Grassland:

This category includes rangelands and pastureland that is not considered as Cropland. It also includes systems with vegetation that fall below the threshold used in the Forest Land category and which are not expected to exceed, without human intervention, the threshold used in the Forest Land category. The category also includes all Grassland from wild lands to recreational areas as well as agricultural and silvo-pastoral systems, subdivided into managed and unmanaged consistent with national definitions.

Settlement:

This category includes all developed land, including transportation infrastructure and human settlements of any size, unless they are already included under other categories. This should be consistent with the selection of national definitions.

Other Land:

This category includes bare soil, rock, ice, and all unmanaged land areas that do not fall into any of the other five categories. It allows the total of identified land areas to match the national area, where data is available. This atlas describes the techniques and methodology to develop digital database of different LULC classes and prepare LULC maps. The overall methodology comprised of acquisition and processing of satellite images, Systematic Sample generation, Visual interpretation of samples, ROI generation, Classification, Post-processing, Accuracy Assessment and Change Detection.

Forest Degradation:

"Human induced long-term losses within Forest persisting for at least 4 years or more due to change in tree canopy cover i.e., open (11-30%), Sparse (31-50%), Medium (51-70 %) Dense (>70 %) resulting in reduction of Forest carbon stock and not qualifying as deforestation.

Satellite Land Monitoring System (SLMS) supports countries in development of systems to implement REDD+ interventions aligned with the National REDD+ Strategies and Action Plans. SLMS is one of the three functions of Measurement, Reporting and Verification (MRV) to continuously monitoring land by supporting National Forest Monitoring System (NFMS). Land use / land cover and land use change analysis data are the basis for activity Data (AD) which are fundamental input to national Greenhouse gas inventories (GHGi), essential for measuring progress towards climate action goals.

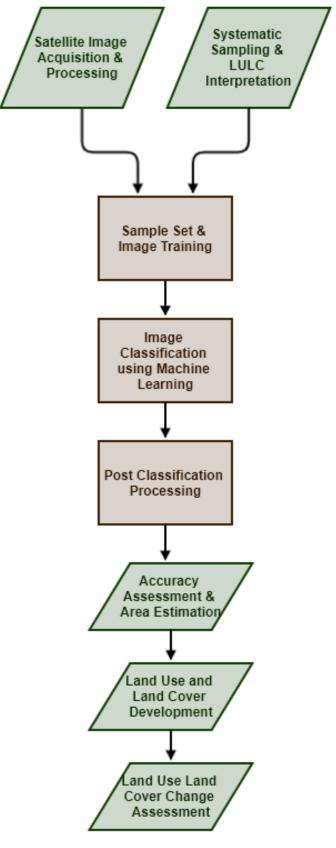
For the development of LULC, Total 130 (65 images for each year) freely available and cloud free (less than 10%) Satellite images of Landsat-8 L2SP (Collection 2 level 2 and Tier 1 Science Product) covering whole Pakistan were downloaded from the USGS Earth Explorer web portal (https://earthexplorer.usgs.gov). After image acquisition, FAO's Sample collection tool "Open-Foris Collect Earth" was used for the interpretation of systematically generated 10'x10' or 5'x5' sample grids to generate training and validations samples. In addition to systematic samples, manual training samples were also taken in cases where misclassification or a low number of samples against a particular class were observed. Then, from systematic and manual plots, Region of Interest (ROI) polygons containing spectral signature against each plot as seed for classification were generated. 70% of the generated ROIs were then used as training samples for image classification and remaining 30% for the accuracy assessments. Random Forest classifier algorithm in QGIS environment was applied to classify the imagery into National and sub-national forest cover maps.

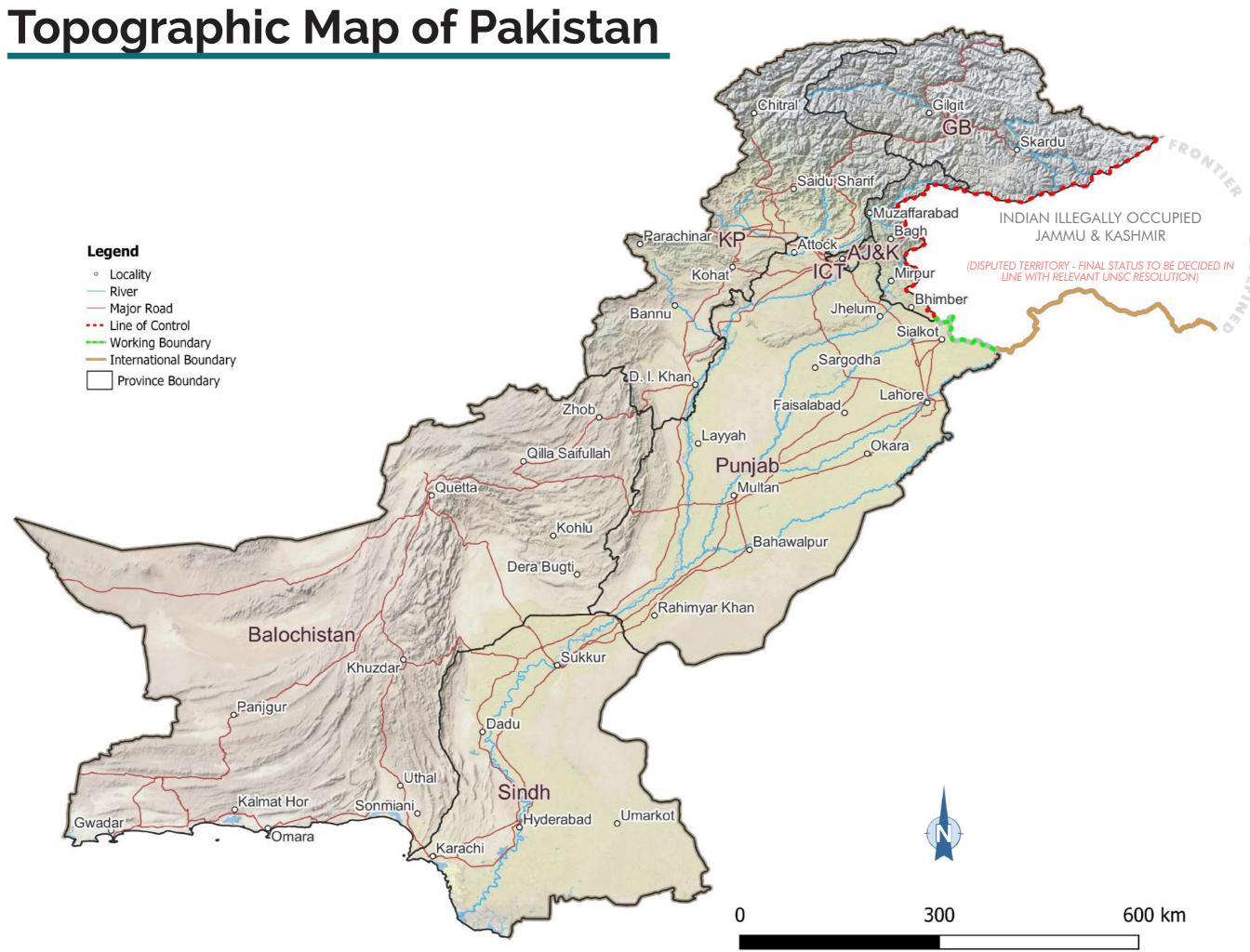
In the post-processing phase, a sieve of two pixels was applied to LULC rasters to reduce noise such as 'salt and pepper' effects. Accuracy assessment and area estimation of the Land Use and Land Cover maps were conducted using the sample of reference observations of the study area. The classification results were further improved by utilising historic LULCs, Feedback from provincial forest departments, field data and experts' ground knowledge. Pixel based Change analysis tool in QGIS was used to estimate the deforestation and enhancement. A sieve of 5 pixels was applied to the deforestation/enhancement rasters to extract the rate of deforestation and enhancement at the national as well as sub-national levels.

Deforestation:

Deforestation is defined as the direct human induced conversion of Forest to non-Forest (UNFCCC) or the permanent reduction of the tree canopy cover below the minimum 10% threshold (FAO, 2015). In scope of Pakistan's first FREL submission, deforestation assessment has been based on changes in natural Forests and exclude irrigated plantations, though the notified Forest definition includes irrigated plantations as one of the Forest types.

Standard templates were designed in QGIS to develop the national and sub national forest cover maps and change maps. Sub national LULC rasters were utilized to develop National scale Forest cover map. Change detection maps for the deforestation and enhancement in the provinces were generated from the change analysis rasters of the reference year of 2016 and 2020.





GEOGRAPHY OF PAKISTAN

Pakistan is a Sub-tropical country with latitudes ranging from 23° 45' to 36° 77' North and longitudes ranging from 61° to 75° 50' East. The country is strategically placed at the crossroads of Asia, where a road connecting China and the Mediterranean meets a road connecting India and Central Asia. Iran borders the country on the west, India on the east, Afghanistan on the north-west, China on the north, and the Arabian Sea on the south. Pakistan is split into three geographical regions: lowlands along the Indus in the south and east, the desert plateau of Balochistan in the southwest, and the mountains in the north. The Indus River, which flows for 2,500 kilometers from the Himalayan and Karakoram Mountain ranges to the Arabian Sea, runs through Pakistan.

The temperature and Forest types of Pakistan vary due to differences in altitude from south to north ranging from sea level to above 8000-meter peaks in Himalayan mountains, while the country's geography ranges from snow-capped mountains in the north to desert and the Arabian Sea in the south. The months of April to September are the most comfortable in the northern half of the nation, with midday temperatures in the low-lying plains of the Indus Valley exceeding 40°C. The coldest months are December, January and February, when the lowland temperature drops to $10 - 25^{\circ}$ C.

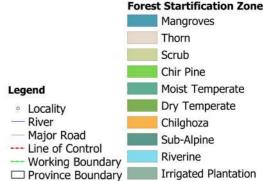
The average annual rainfall is 760 mm. Annual average rainfall in the plains ranges from 130 mm in the northern Indus plains to 890 mm in the Himalayan highlands. Monsoons arrive in late summer in the southern areas of the country, although rainfall is minimal in Balochistan and in northern parts (Gilgit-Baltistan, and northern parts of Khyber Pakhtunkhwa).



FOREST STRATIFICATION OF PAKISTAN

Climate Zone 1. Tropical	Main Forest Stratum					
1. Tropical	Wall FUIESt Stratulli	Sub-Stratum	and the states of the		ţ	Nţ
	1.1 Littoral and Swamp Forest	1.1.1 Mangroves				
	1.2 Dry Deciduous			È.		
	1.3 Thorn Forest		Chitral	1		
	1.4 Riverine Forest		GB	and		
. Sub-Tropical	2.1 Broad-laved evergreen Scrub	2.1.1 Montane sub-tropical scrub	Skard	du i i i ut	~	
	forests	2.1.2 Sub-tropical broad-leaved evergreen		the start	Ro	
	2.2 Chir Pine Forests		Saidu Sharif	1		
. Temperate	3.1 Moist Temperate Forests			and my	11	
remperate	3.2 Dry Temperate Forests	3.2.1 Montane Dry Temperate Coniferous	Muzaffarabad	2 V		
	3.2 Dry remperate rolests	3.2.2 Dry temperate Juniper and Chilghoza	KP Bagin INDIAN	I ILLEGATER OCCUR	IED	
			Parachinar	AMMU & KASHMIR	5 m	
Alalas	4.4 Cub Alatina Facanta	3.2.3 Dry Temperate Broad-leaved	ICTIslamabad	25 2		Z
. Alpine	4.1 Sub-Alpine Forests	5.4.4 Deed side electrolices	(DISPUTED JERRIT	TORY - FINAL STATUS TO BE	PECIDED IN	D
. Plantations	5.1 Linear	5.1.1 Road side plantations	Bhimber	RELEVANT UNSC RESOLUTION	CHEL	
		5.1.2 Railway side plantations	Jhelum 2 Chilling		~	1
		5.1.3 Canal side plantations	Sialkot		<u>~</u> 1	
	5.2 Irrigated Plantations		Sargodha	Y I I	0	
			Multan			
	Panjgu	Balochistan Khuzdar	Cohlu Dera Bugli Rahimyar Khan Sukkur	Legend Locality	Dry Te Chilgh Sub-Al Riverin Irrigat	ine Temperate emperate oza Ipine ne ed Plantati
	Panjgu	Khuzdar	Dera Bugti Rahimyar Khan	 Locality River Major Road Line of Control Working Boundary Province Boundary ALTITUDE RANGE (NORTHERN/SOUTHERN)	Chir Pi Moist ⁻ Dry Te Chilgh Sub-Al Riverin Irrigat	ine Temperate oza Ipine ne ed Plantati MININ
F	Panjgu	r Khuzdar	Dera Bugti Rahimyar Khan Sukkur FOREST STRATUM	 Locality River Major Road Line of Control Working Boundary Province Boundary ALTITUDE RANGE (NORTHERN/SOUTHERN)	Chir Pi Moist ⁻ Dry Te Chilgho Sub-Al Riverin Irrigato	ine Temperate oza Ipine ne ed Plantati MININ TEMPER
		Ir Uthal	Dera Bugti Rahimyar Khan Sukkur FOREST STRATUM LITTORAL AND SWAMP (MANGROVES)	 Locality River Major Road Line of Control Working Boundary Province Boundary ALTITUDE RANGE (NORTHERN/SOUTHERN ASPECT) 	MEAN ANNUAL RAINFALL	ine Temperate emperate oza Ipine ne
	Kalmat	Ir Uthal	Dera Bugtion Rahimyar Khan Sukkur FOREST STRATUM LITTORAL AND SWAMP (MANGROVES)	 Locality River Major Road Line of Control Working Boundary Province Boundary ALTITUDE RANGE (NORT HERN/SOUT HERN	MEAN ANNUAL RAINFALL 16-23 cm 83-107 cm	ine Temperate oza Ipine ed Plantati MININ TEMPER 16 10 10
		ur Uthal	Dera Bugti Rahimyar Khan Sukkur FOREST STRATUM Sindh LITTORAL AND SWAMP (MANGROVES) THORN DRY DECIDUOUS SCRUB SCRUB	 Locality River Major Road Line of Control Working Boundary Province Boundary Province Boundary Max3 m 3-385 m 253-510 m 457-1524 m 	MEAN ANNUAL RAINFALL 16-23 cm 32-49 cm 12-98 cm	ine Temperate oza Ipine ed Plantat MINII TEMPER 16 10 10 7
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LULC Map of Pakistan - 2016

Forest type	ІСТ	Punjab	Sindh	КР	Balochistan	AJ&K	GB	National Forest Area	
Mangrove			127,585		6,231			133,816	A
Thorn		36,097	29,829	1,030	35,954	423		103,333	
Scrub	25,530	386,659	1,990	157,568	277,164	150,865		999,776	
Chir Pine		132,585		310,565		190,833		633,983	
Moist Temperate		1,291		297,545		251,467		550,302	
Dry Temperate				812,749		19,292	199,462	1,031,504	
Dry Temperate (Chilghoza)				3,895	21,589			25,484	
Dry Temperate (Juniper)					200,512			200,512	
Sub-Alpine				15,636		4,330	77,979	97,945	Saidu Sharif
Riverine		31,982	85,890					117,871	
Irrigated Plantation		45,926	14,746					60,672	
Farm Plantation							49,981	49,981	
Total Forest Area	25,530	634,539	260,039	1,598,989	541,450	617,211	327,422	4,005,180	Parachinar KP Bagh AJ&K
%age	28.18	3.09	1.85	15.72	1.56	46.42	4.70	4.56	Conat Attock ICT Islamabad Mirpur (DISPUTEL
		*/	All the areas ar	e calculated in He	ectare				Bannu R Bannu R
Land cover Forest Cropland	Riv Lin Lin V	cality ver ajor Road ne of Cor	d htrol	Working I Internatio	Balochi	ndary ry	Cue Cue Khuzdar Uthal ani Karaci	tta Dadu Dadu Sind	Child Saifulah Child Child Saifulah Child Child Saifulah Child Child Saifulah Child Child Child Saiful C
Cropland		583,364						See. 4	mm of 2
Grassland	14,	680,913					K	Syn S	
Wetland	1,3	307,542				0			

400

600 km

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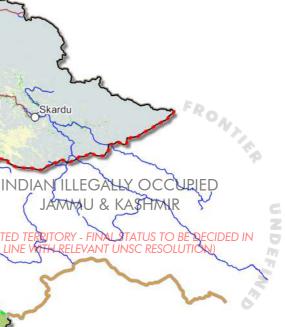
Settlement

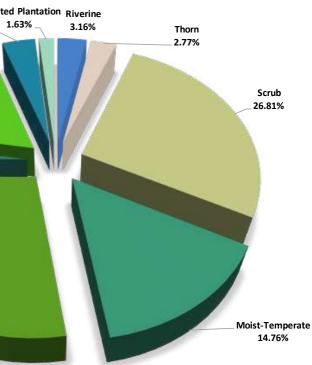
Other land

737,202

48,596,399



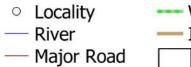


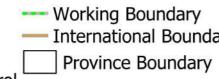


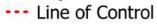
LULC Map of Pakistan - 2020

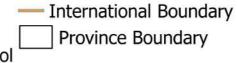
Forest type	ІСТ	Punjab	Sindh	КР	Balochistan	AJ&K	GB	National Forest Area
Mangrove			151,045		6,312			157,357
Thorn		35,248	42,167	1,843	36,308	451		116,017
Scrub	25,882	403,334	1,488	162,692	280,040	151,694		1,025,130
Chir Pine		134,267		314,575		190,944		639,785
Moist Temperate		1,199		303,634		251,692		556,524
Dry Temperate				838,036		19,323	200,292	1,057,651
Dry Temperate (Chilghoza)				3,956	21,760			25,716
Dry Temperate (Juniper)					202,477			202,477
Sub-Alpine				19,562		4,355	78,403	102,320
Riverine		30,016	82,862					112,878
Irrigated Plantation		47,936	18,838					66,774
Farm Plantation							51,026	51,026
Total Forest Area	25,882	651,999	296,400	1,644,297	546,897	618,460	329,721	4,113,657
%age	28.57	3.18	2.10	16.16	1.58	46.51	4.73	4.68
		* Al	I the areas are	calculated in He	ectare			
Legen	d							~ ~



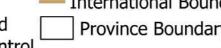




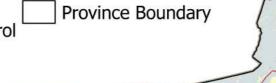


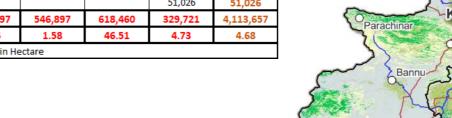












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Punjab

600 km

ICT





Kohlu

Dera Bugti

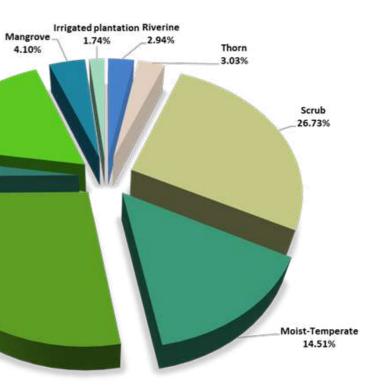
Land cover Type Area in Hectare Forest 4,113,655 Cropland 19,248,596 532,767

Grassland	14,632,767
Wetland	1,711,153
Settlement	841,815
Other land	47,362,614

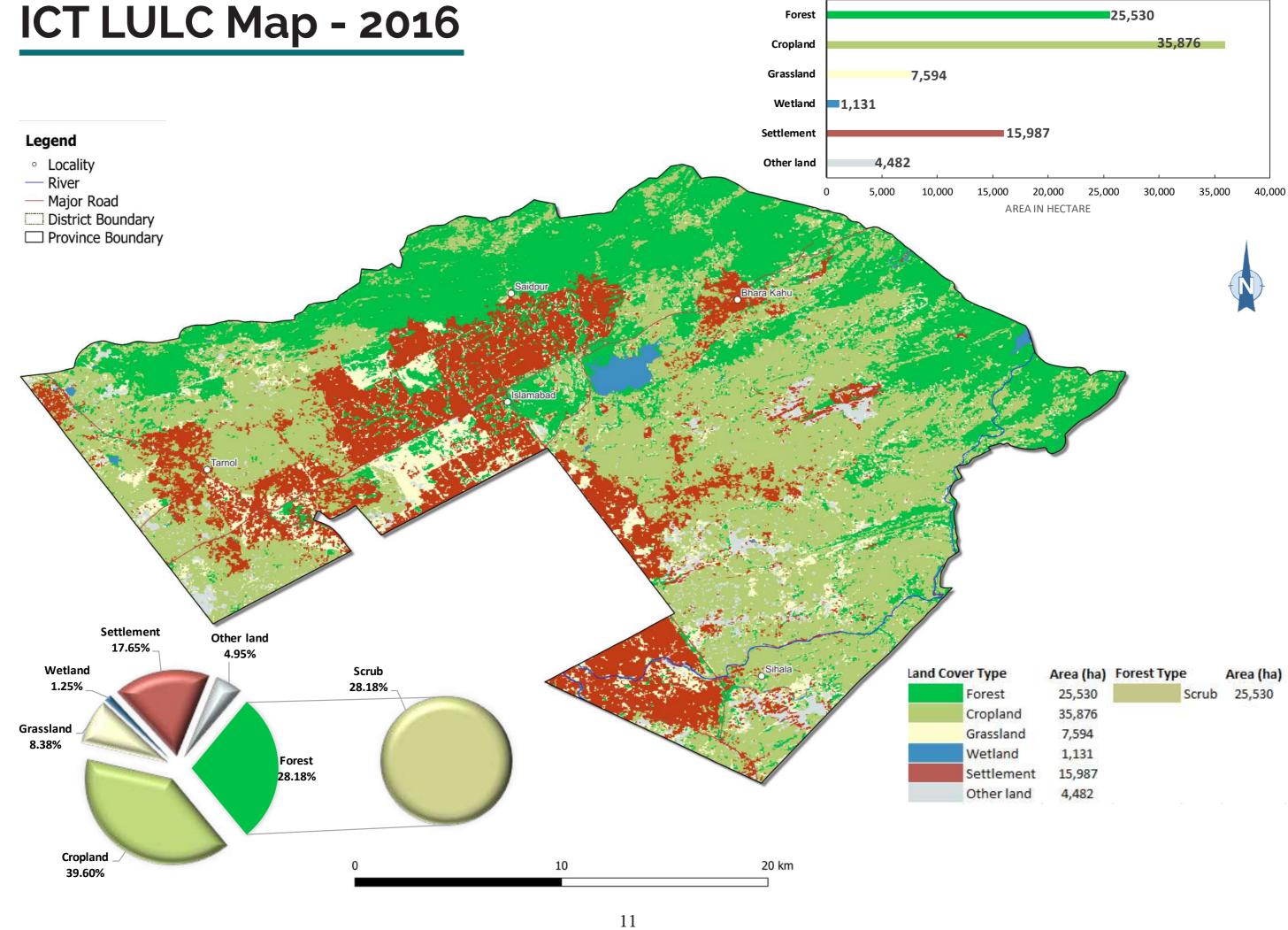
400



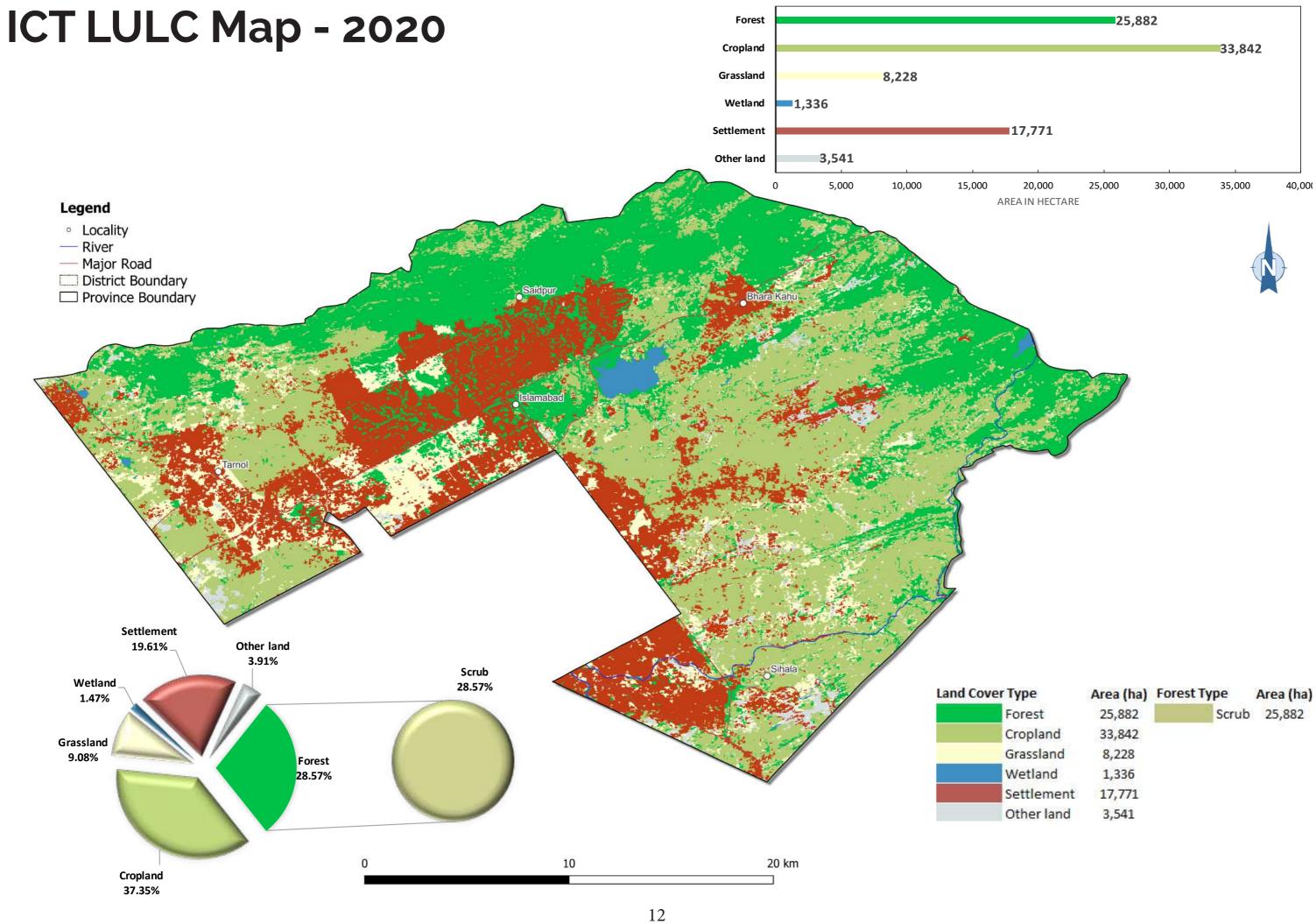






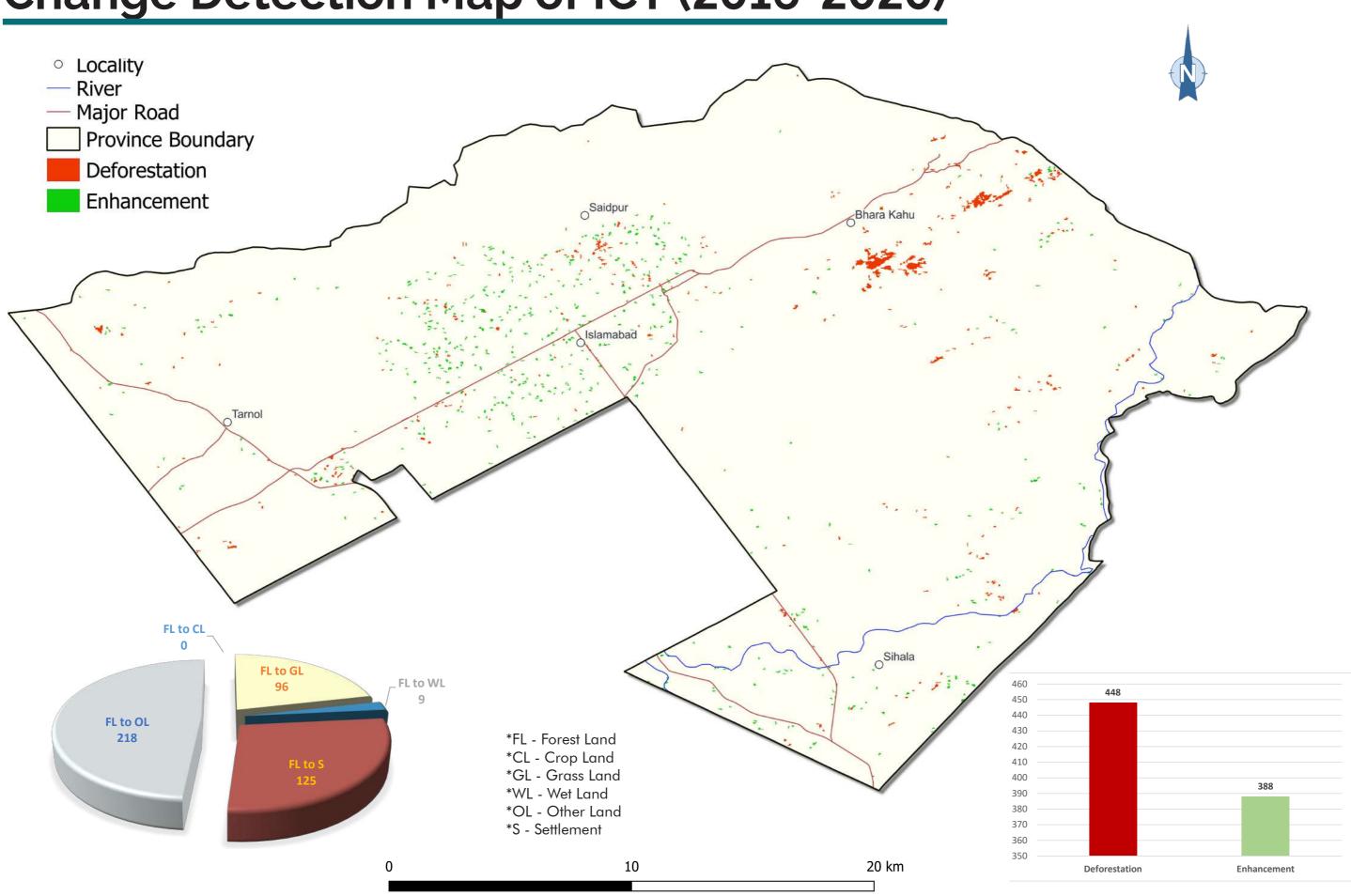


/pe	Area (ha)	Forest Type	Area (ha)
est	25,530	Scrub	25,530
pland	35,876		
ssland	7,594		
tland	1,131		
tlement	15,987		
er land	4,482		

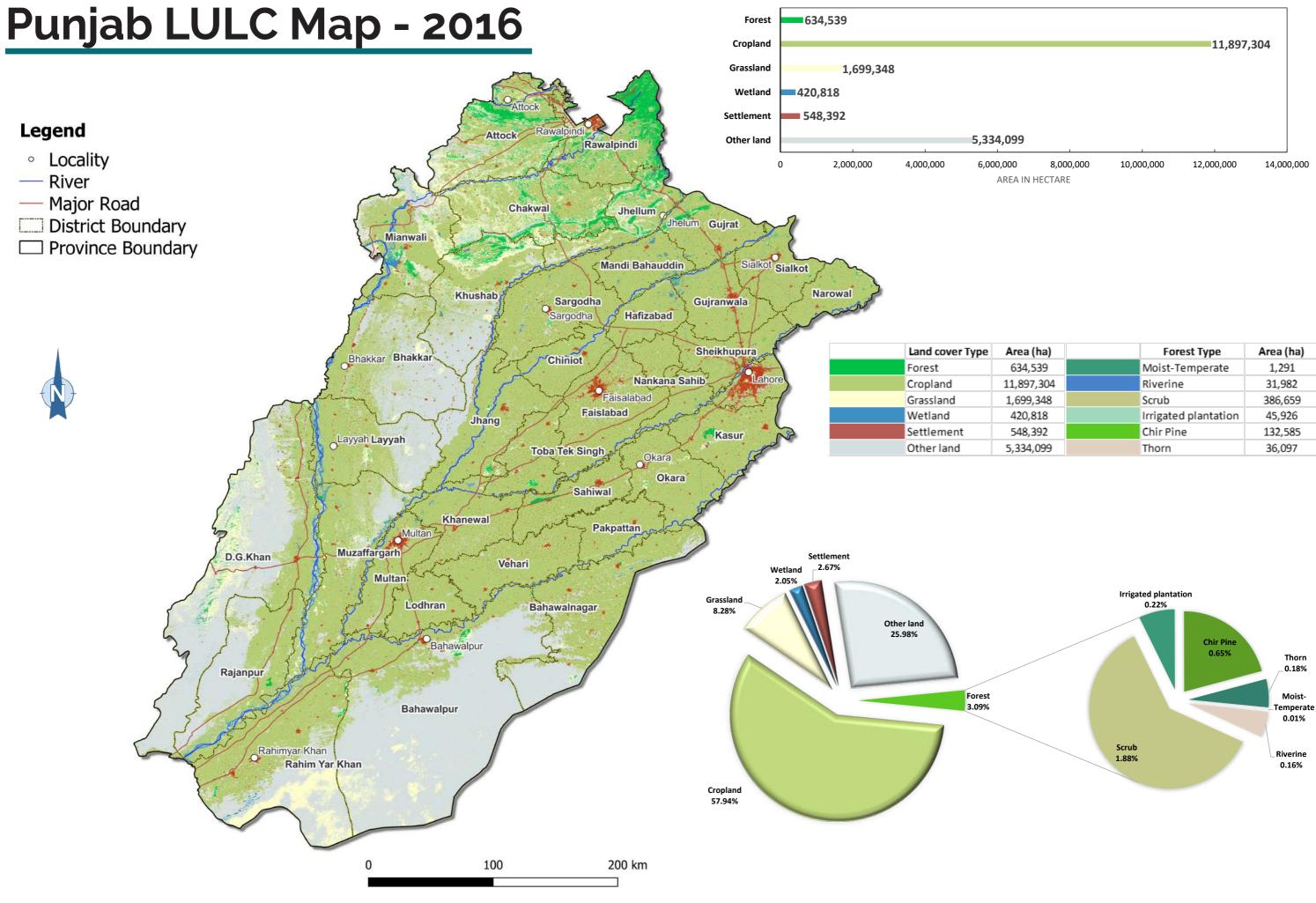


ype	Area (ha)	Forest Type	Area (ha)
orest	25,882	Scrub	25,882
ropland	33,842		
irassland	8,228		
Vetland	1,336		
ettlement	17,771		
ther land	3,541		

Change Detection Map of ICT (2016-2020)

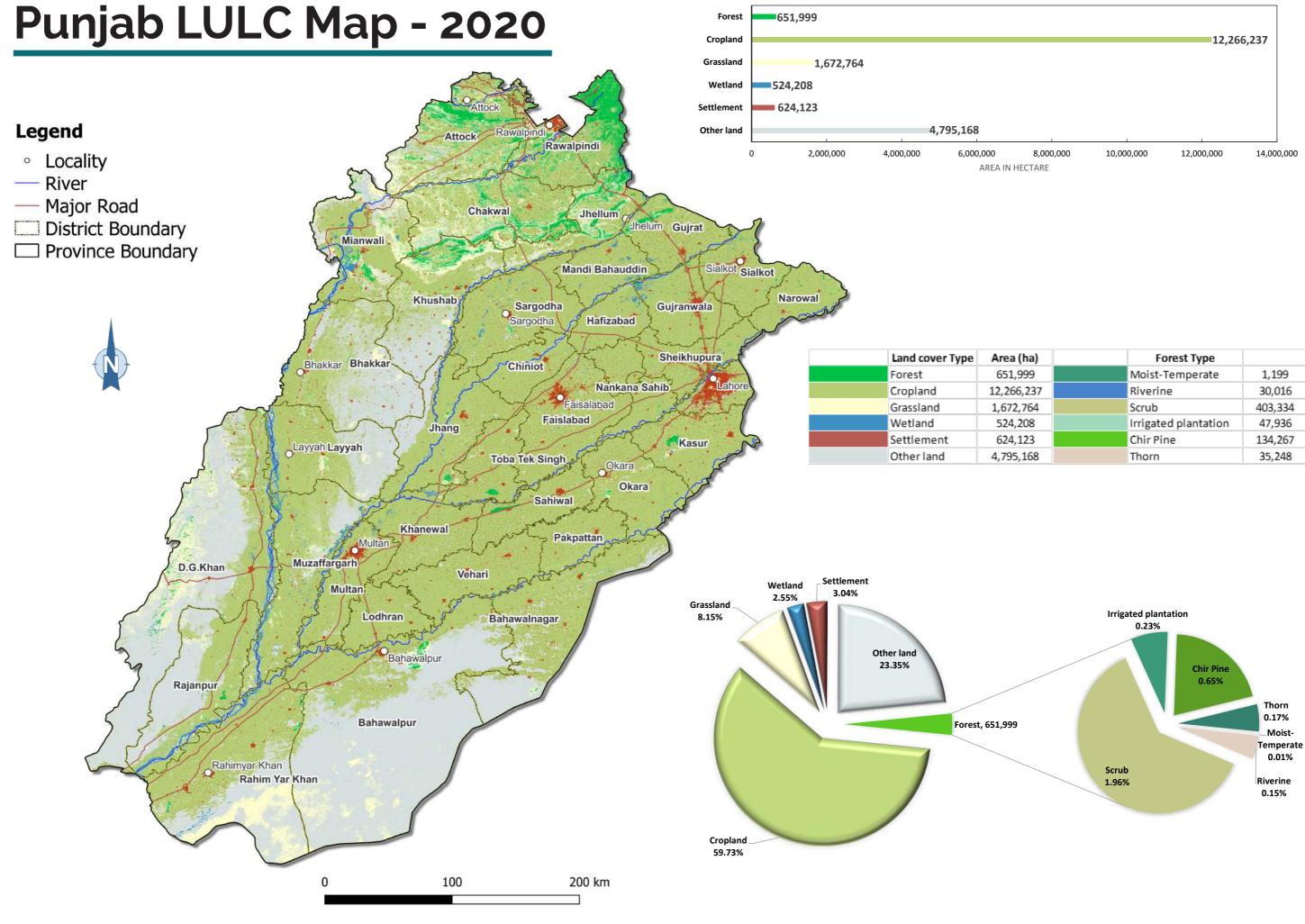


* All areas are calculated in Hectare



				1	1,897,30	14	
9	1						
8,000	D,000	10,000	0,000	12,00	0,000	14,00	0,000

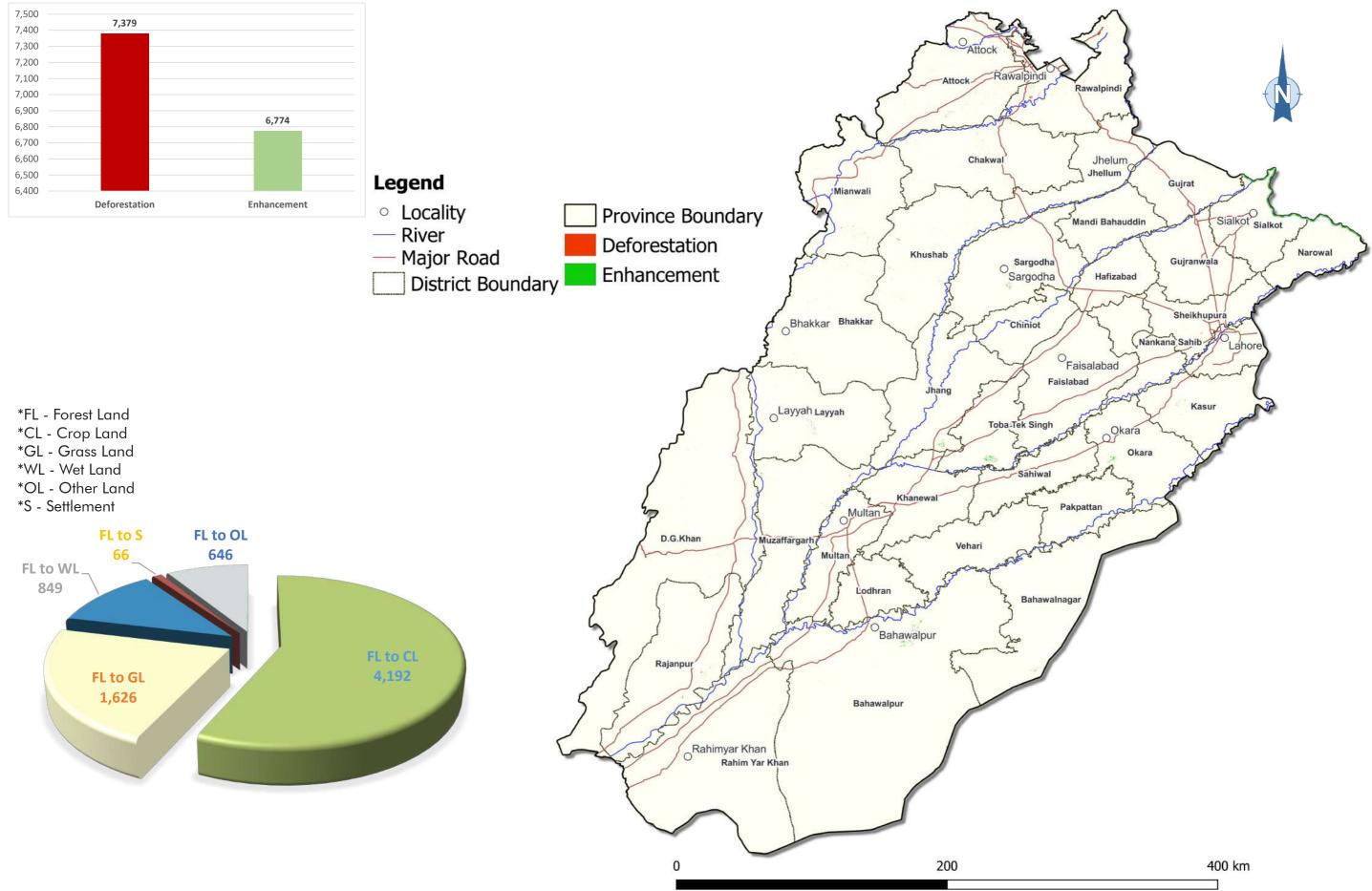
Forest Type	Area (ha)
Moist-Temperate	1,291
Riverine	31,982
Scrub	386,659
Irrigated plantation	45,926
Chir Pine	132,585
Thorn	36,097
	Moist-Temperate Riverine Scrub Irrigated plantation Chir Pine

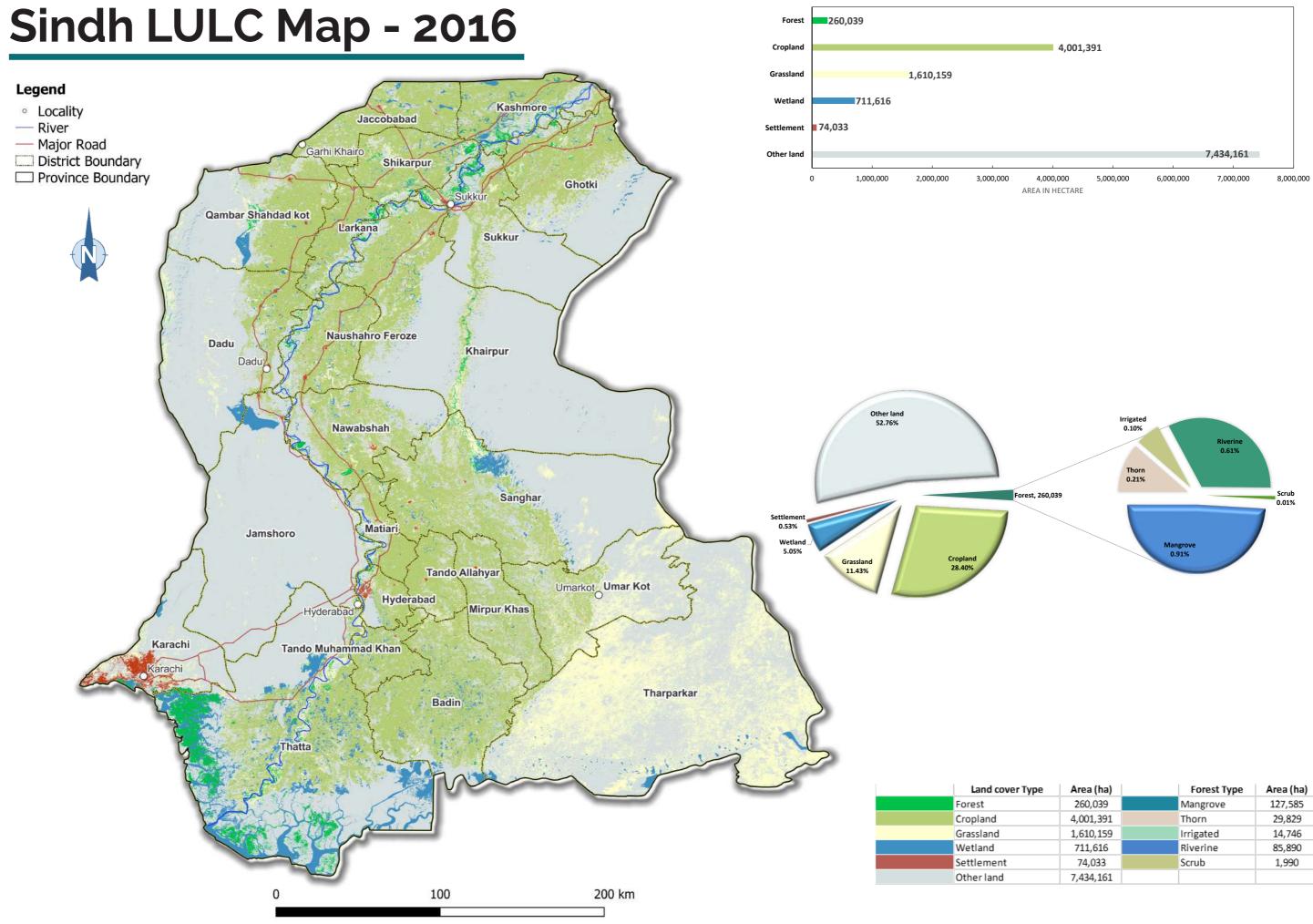


		12,	266,237
8,000,000	10,000,000	12,000,000	14,000,000

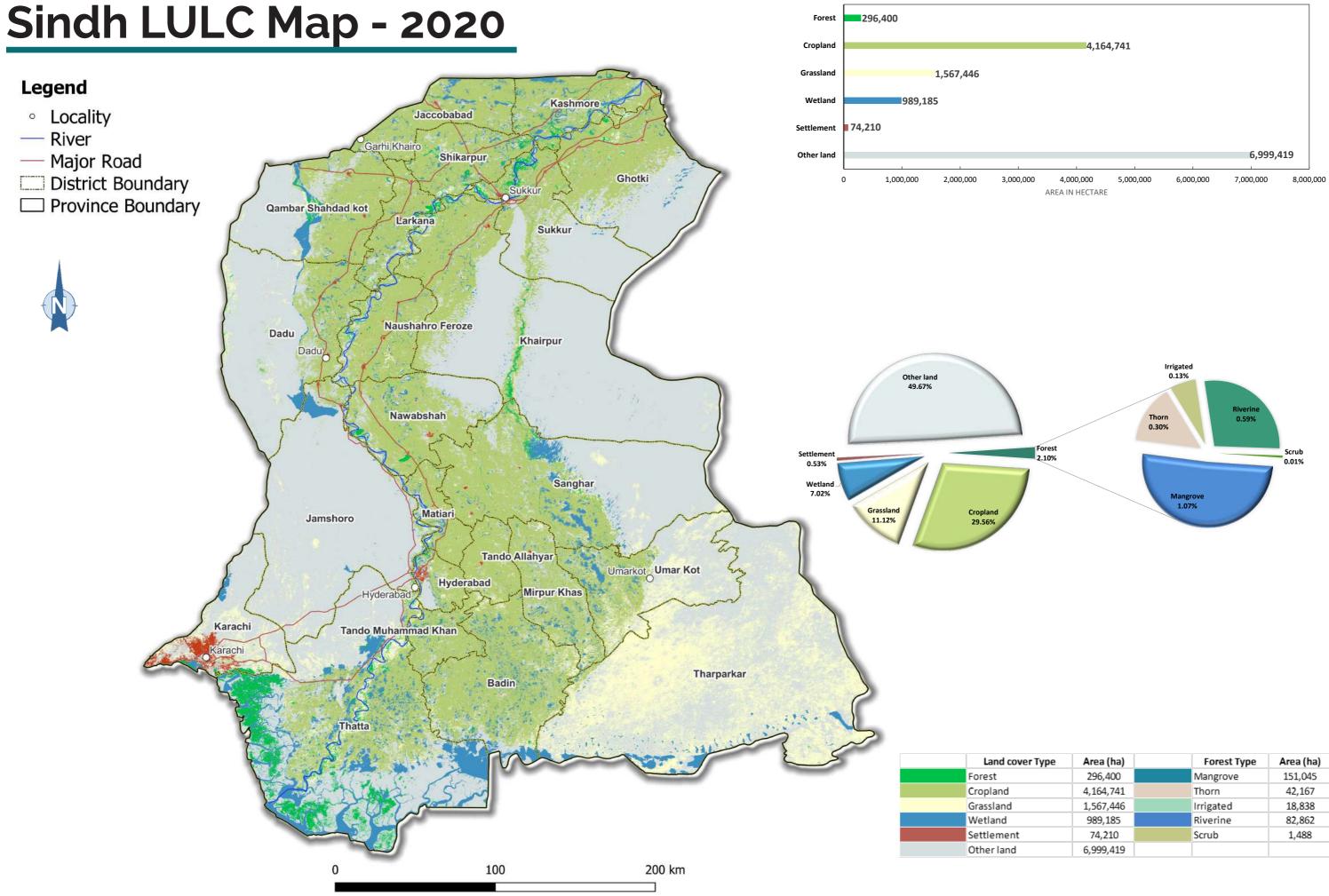
Forest Type	
Moist-Temperate	1,199
Riverine	30,016
Scrub	403,334
Irrigated plantation	47,936
Chir Pine	134,267
Thorn	35,248
	Moist-Temperate Riverine Scrub Irrigated plantation Chir Pine

Change Detection Map of Punjab (2016-2020)



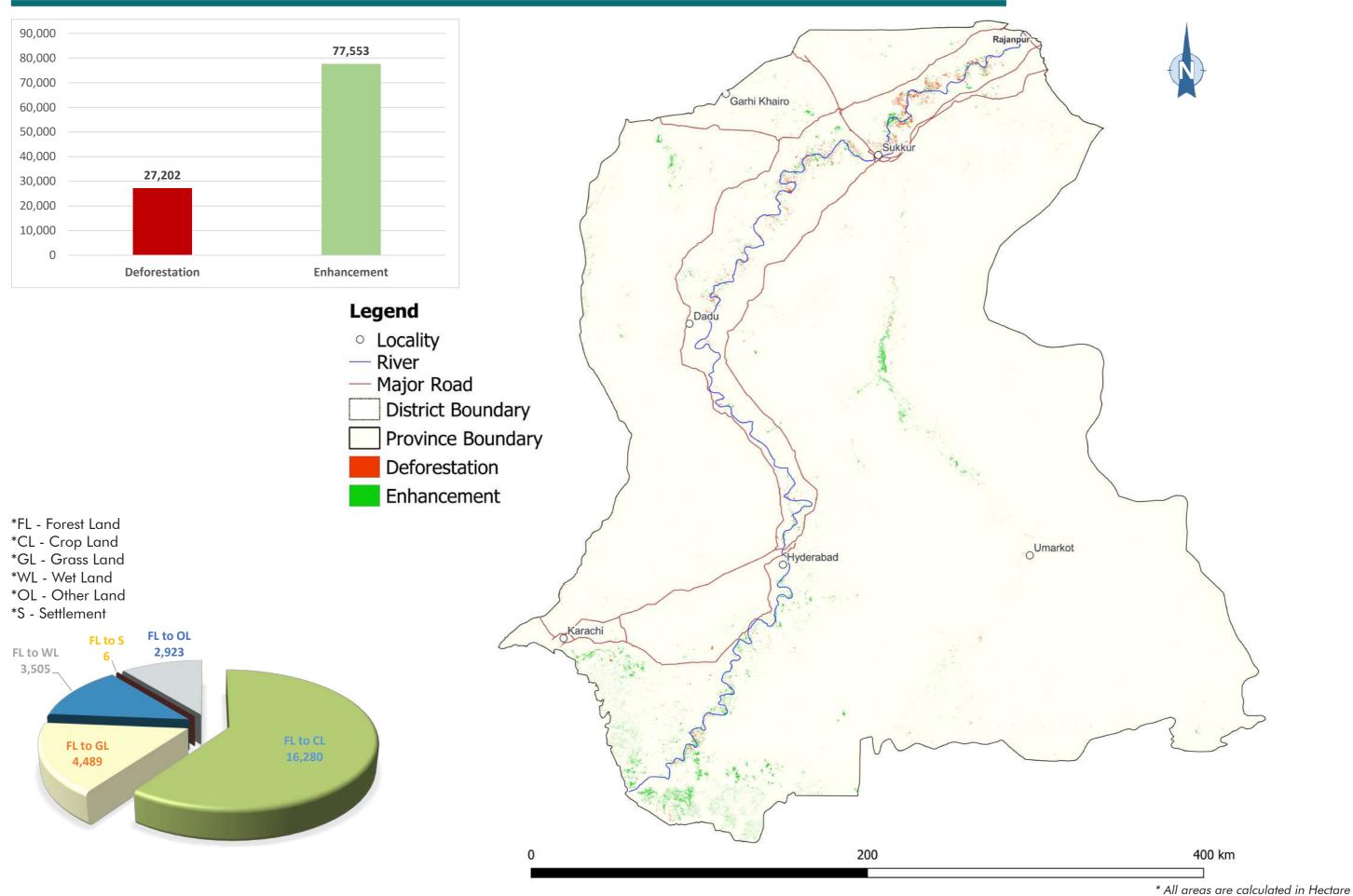


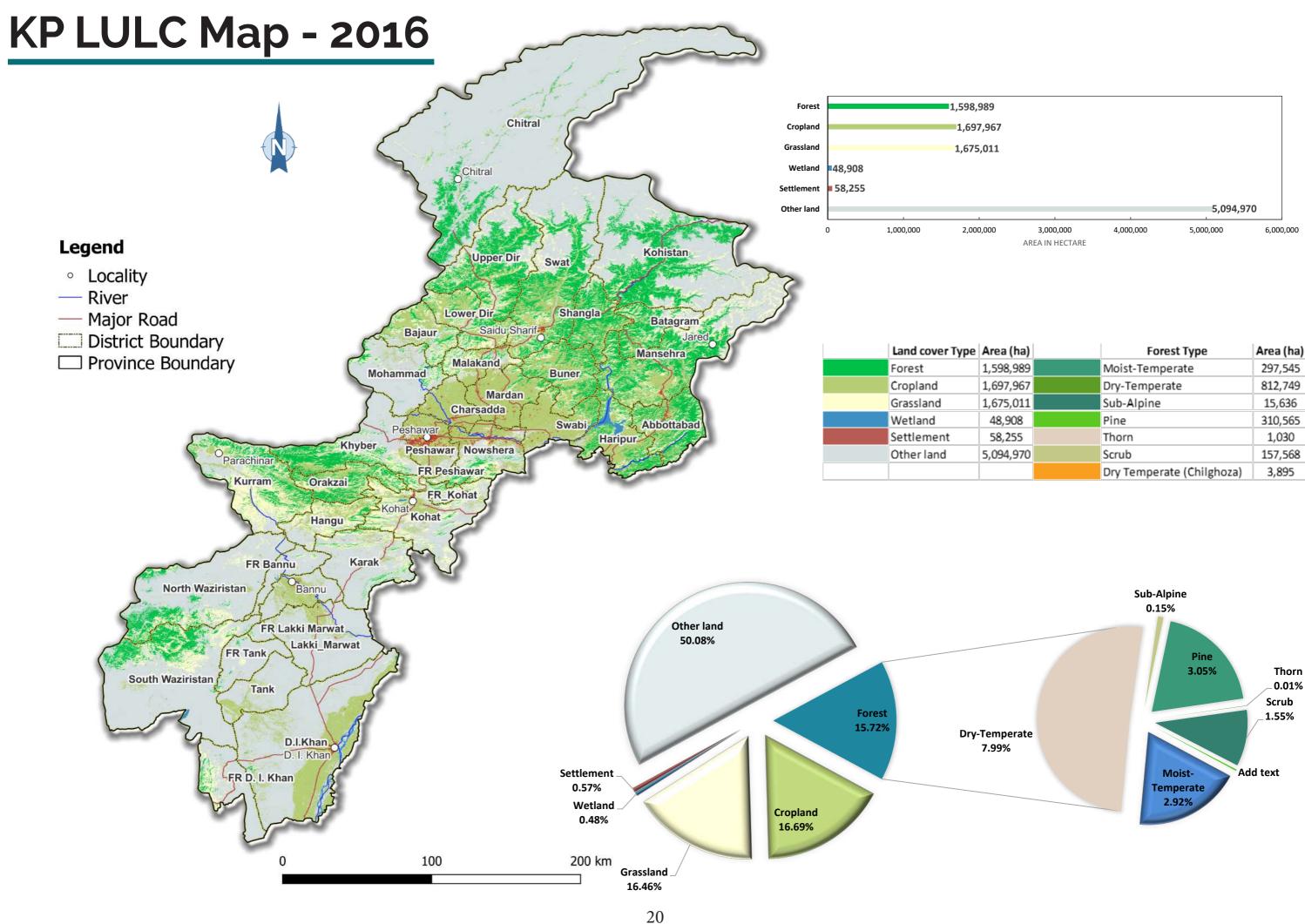
ver Type	Area (ha)	Forest Type	Area (ha)
	260,039	Mangrove	127,585
	4,001,391	Thorn	29,829
	1,610,159	Irrigated	14,746
	711,616	Riverine	85,890
	74,033	Scrub	1,990
	7,434,161		



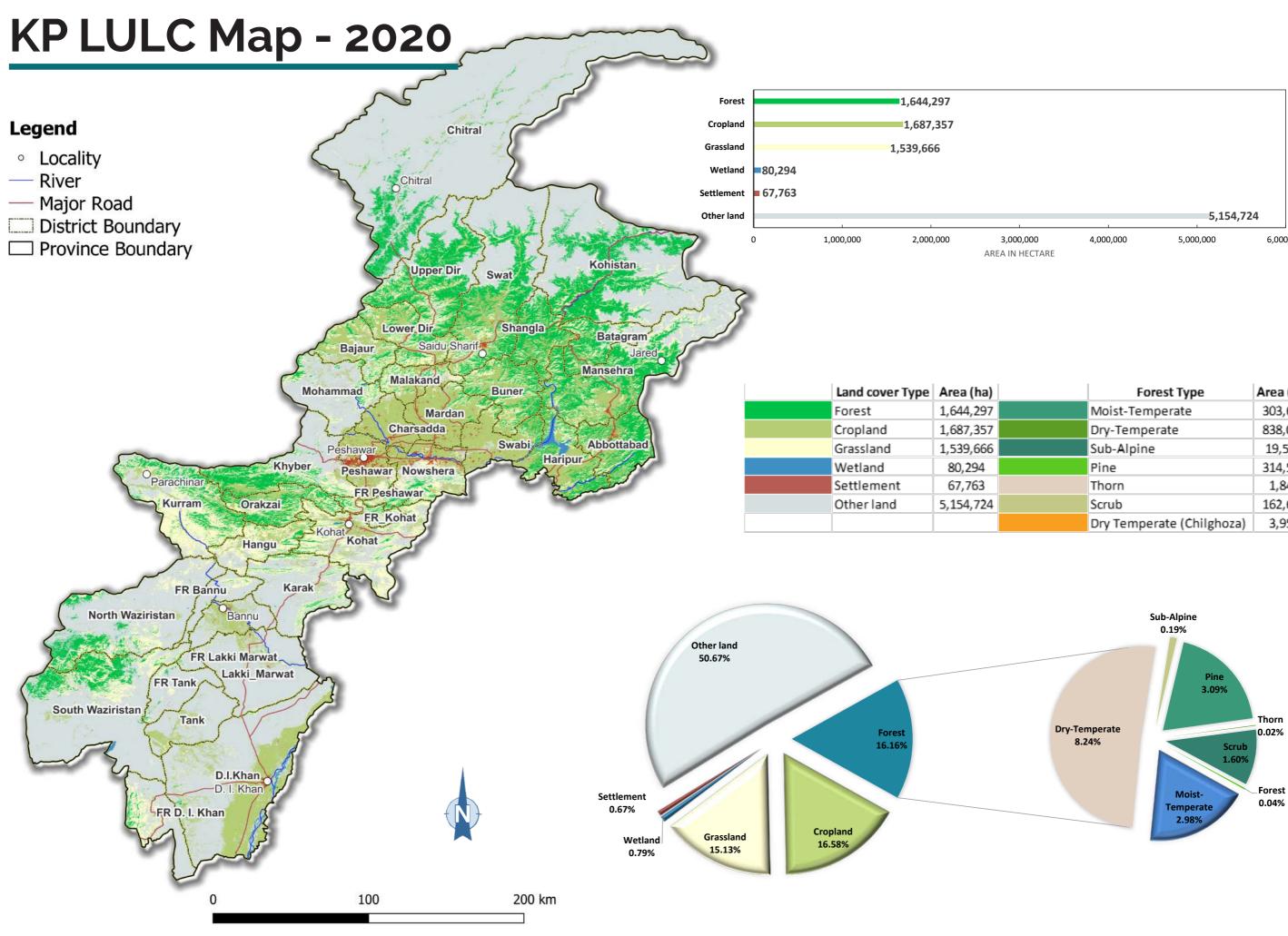
r Type	Area (ha)	Forest Type	Area (ha)
	296,400	Mangrove	151,045
	4,164,741	Thorn	42,167
	1,567,446	Irrigated	18,838
	989,185	Riverine	82,862
	74,210	Scrub	1,488
	6,999,419		

Change Detection Map of Sindh (2016-2020)





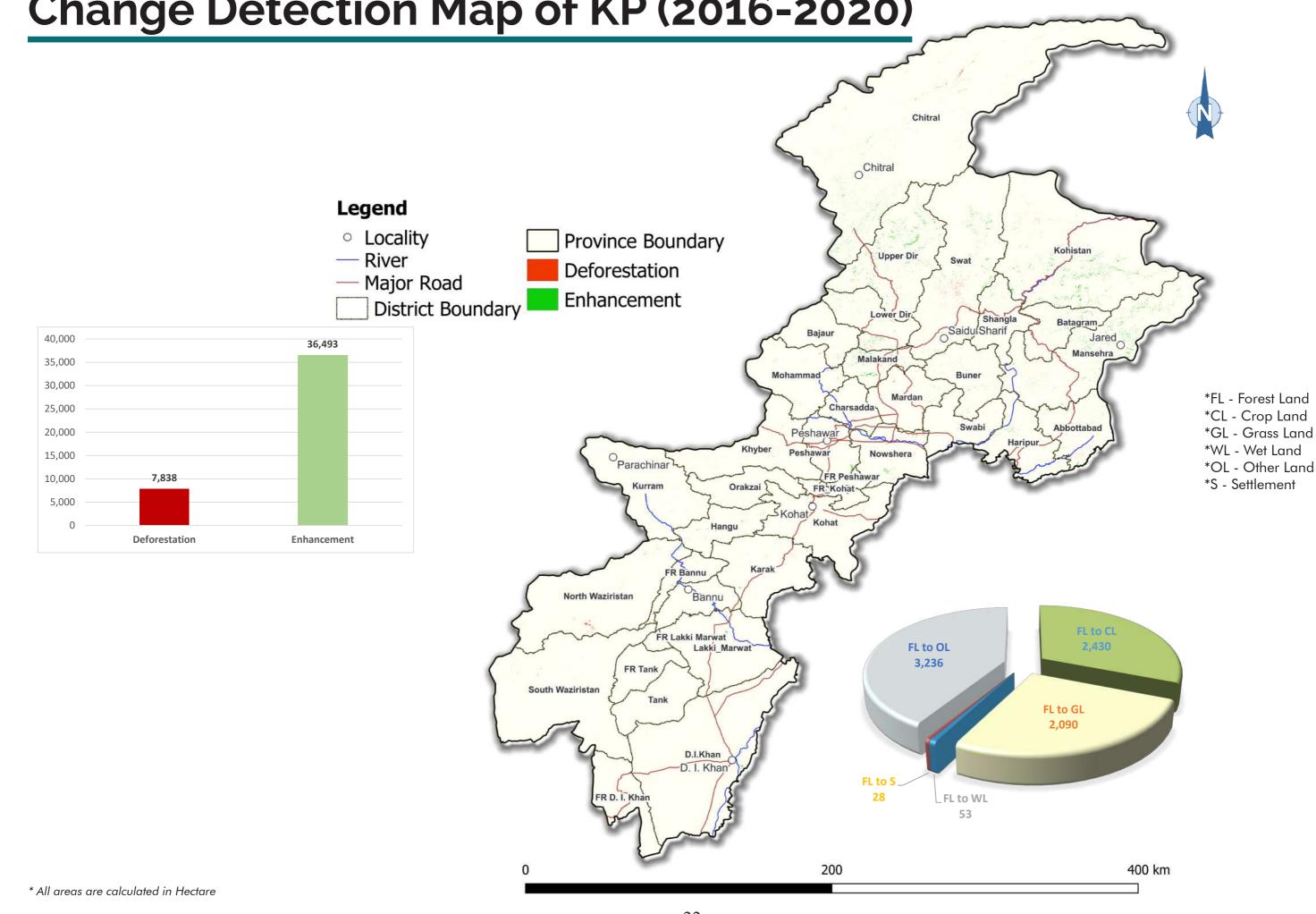
(ha)	Forest Type	Area (ha)
,989	Moist-Temperate	297,545
,967	Dry-Temperate	812,749
,011	Sub-Alpine	15,636
08	Pine	310,565
55	Thorn	1,030
,970	Scrub	157,568
	Dry Temperate (Chilghoza)	3,895



	I	5,154,72	4
)	4,000,000	5,000,000	6,000,000

Forest Type	Area (ha)
Moist-Temperate	303,634
Dry-Temperate	838,036
Sub-Alpine	19,562
Pine	314,575
Thorn	1,843
Scrub	162,692
Dry Temperate (Chilghoza)	3,956

Change Detection Map of KP (2016-2020)



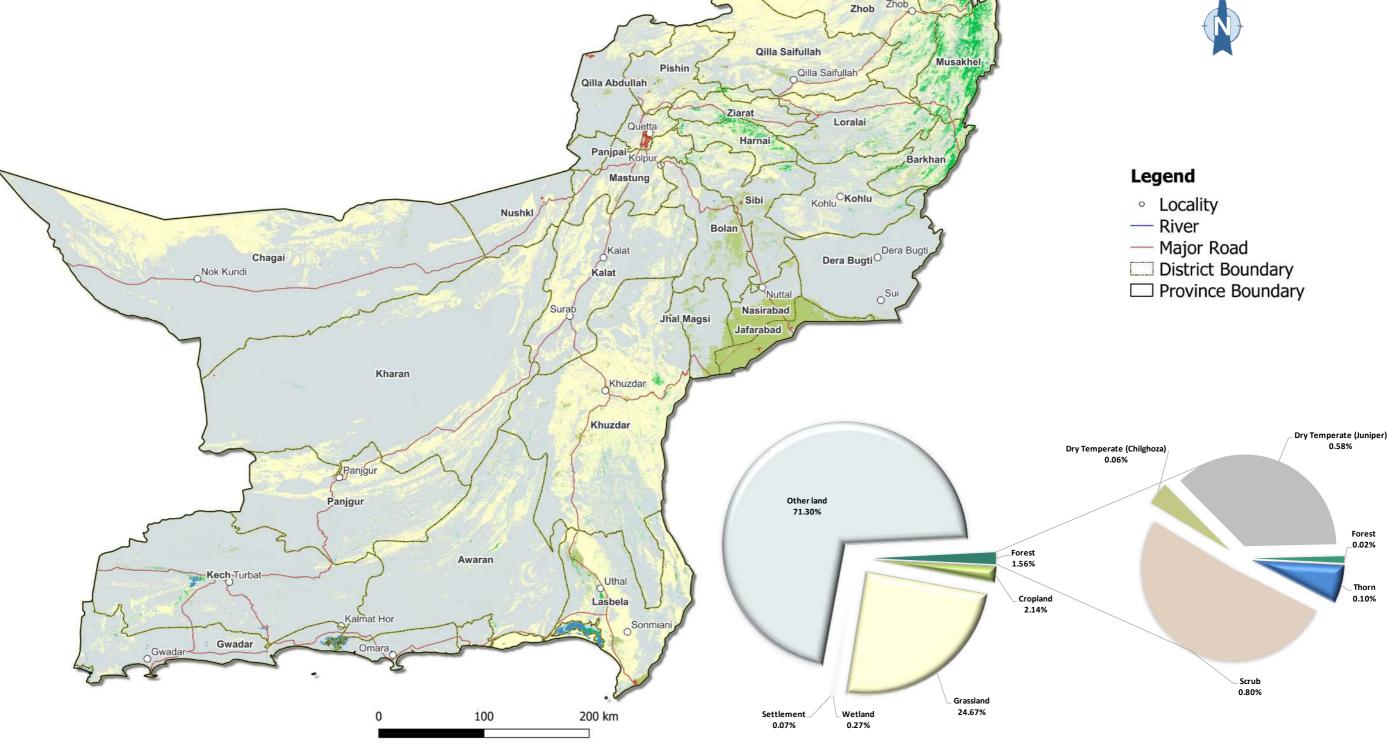
Balochistan LULC Map - 2016

Forest	541,450			
Cropland	743,245			
Grassland			8,566,186	
Wetland	92,359			
Settlement	22,731			
Other land		1	1	1
	0	5,000,000	10,000,000	15,000 AREA IN F

Shera

Zhob

Land cover Type	e Area (ha)	Forest Type	Area (ha)
Forest	541,450	Thorn	35,954
Cropland	743,245	Scrub	277,164
Grassland	8,566,186	Dry Temperate (Chilghoza	21,589
Wetland	92,359	Dry Temperate (Juniper)	200,512
Settlement	22,731	Mangrove	6,231
Other land	24,753,029		



00,000 I HECTARE

20,000,000

24,753,029

25,000,000

30,000,000



Balochistan LULC Map - 2020

Land cover Ty	ype Area (ha)	Forest Type	Area (ha)
Forest	546,897	Thorn	36,308
Cropland	887,183	Scrub	280,040
Grassland	8,581,977	Dry Temperate (Chilghoza) 21,760
Wetland	82,197	Dry Temperate (Juniper)	202,477
Settlement	38,885	Mangrove	6,312
Other land	24,581,860		

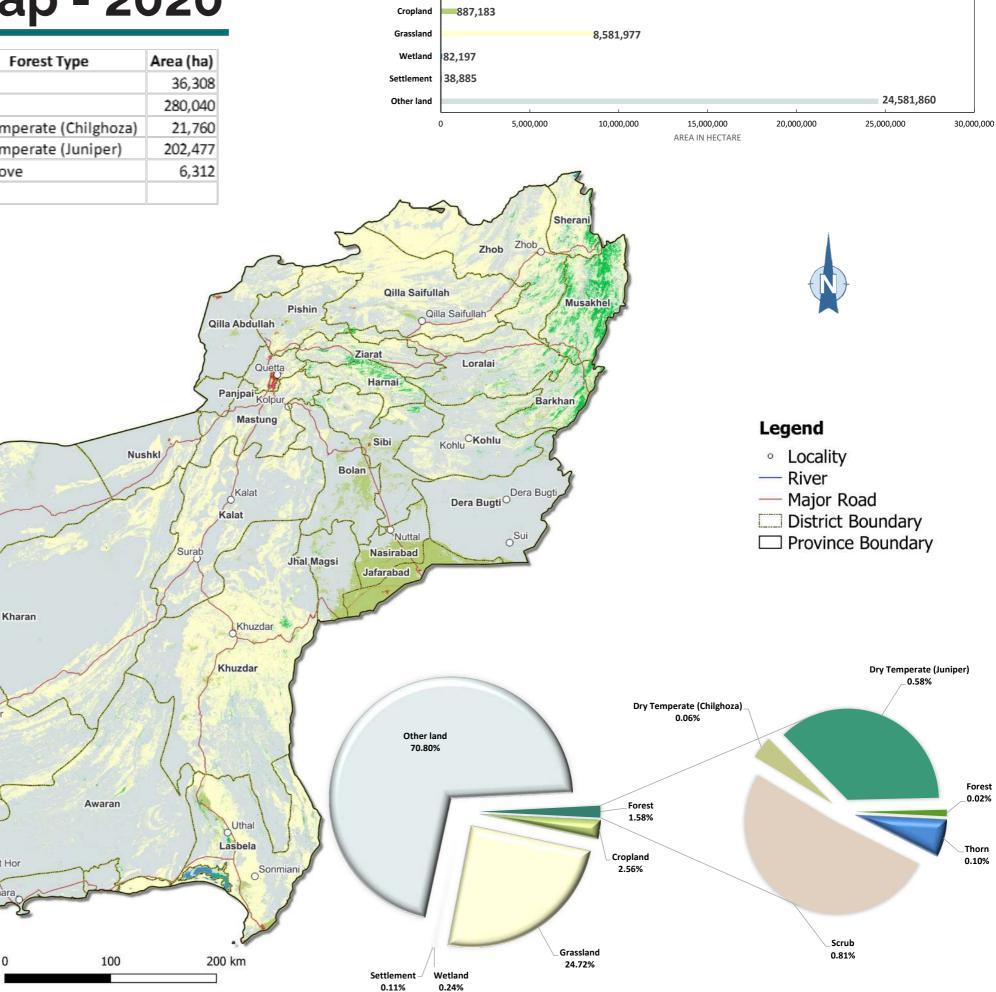
Chagai

Panigu

Nok Kundi

Kech Turbat

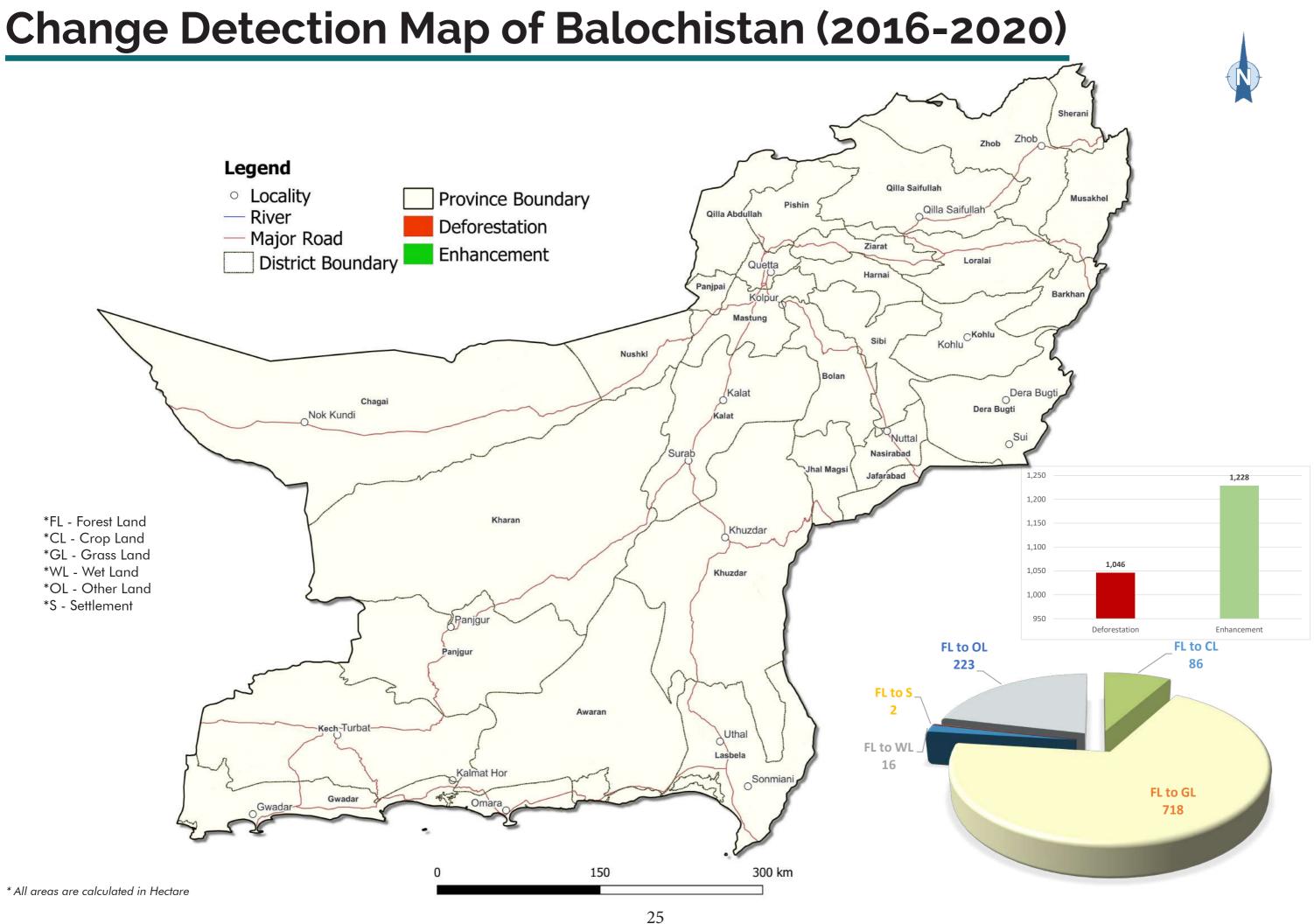
Gwadar



546,897

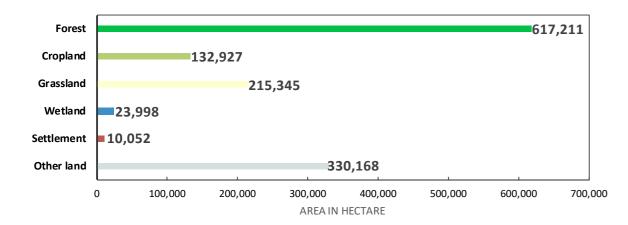
Forest

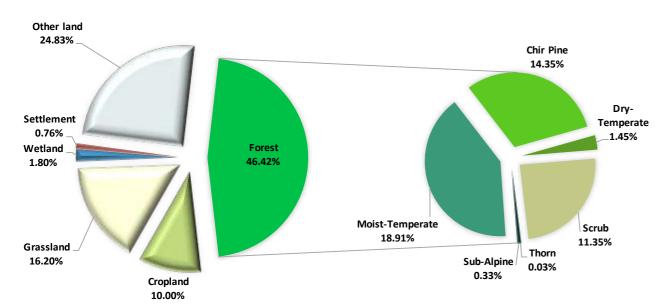


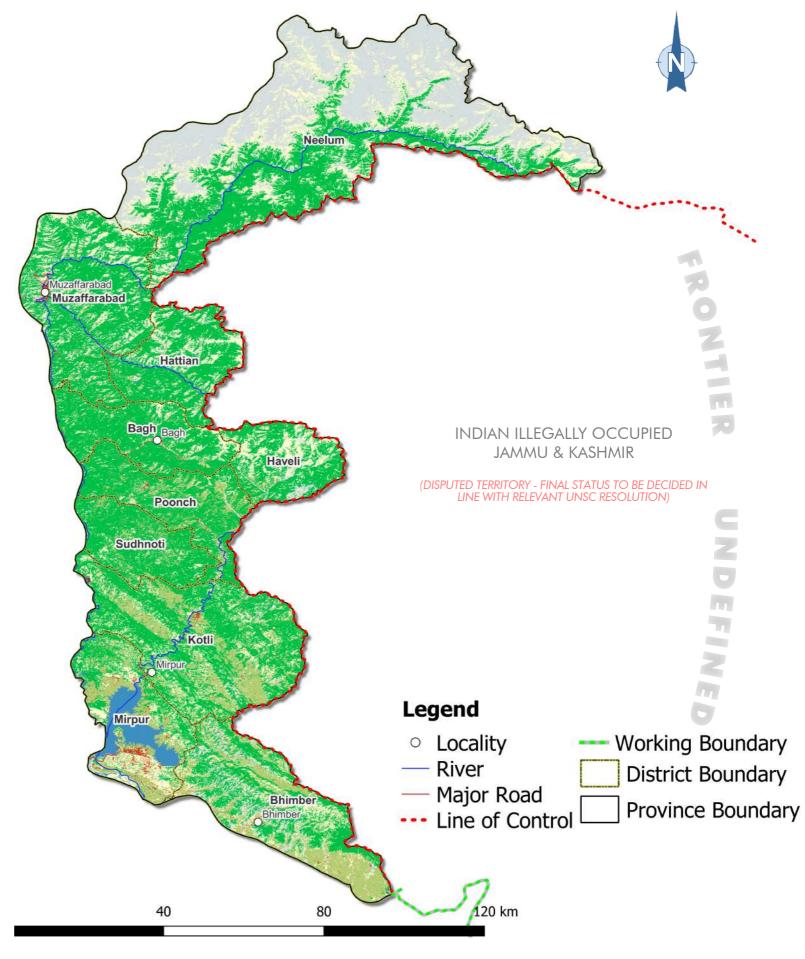


AJ&K LULC Map - 2016

Land cover Type	Area (ha)	Forest Type	Area (ha)
Forest	617,211	Sub-Alpine	4,330
Cropland	132,927	Moist-Temperate	251,467
Grassland	215,345	Chir Pine	190,833
Wetland	23,998	Dry-Temperate	19,292
Settlement	10,052	Scrub	150,865
Other land	330 <mark>,1</mark> 68	Thorn	423

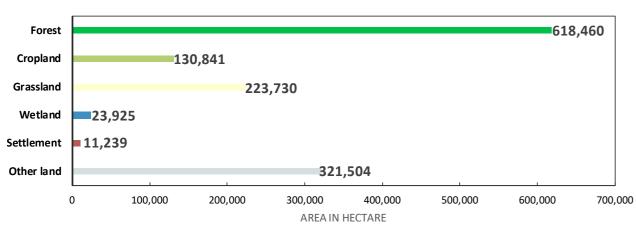


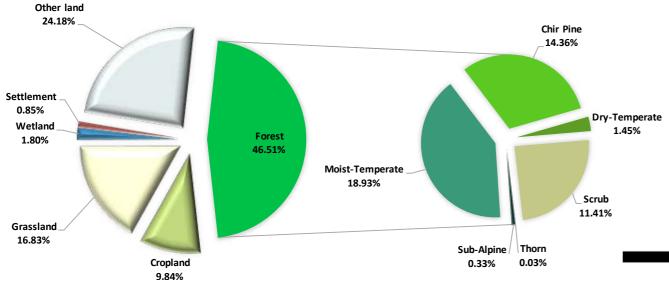


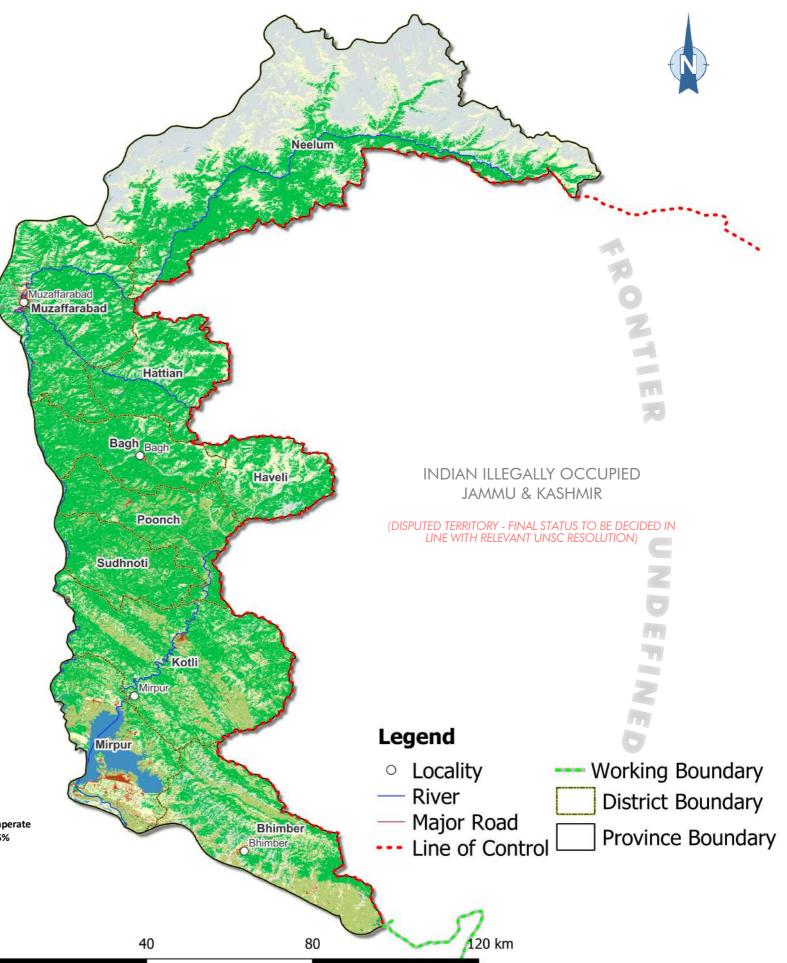


AJ&K LULC Map - 2020

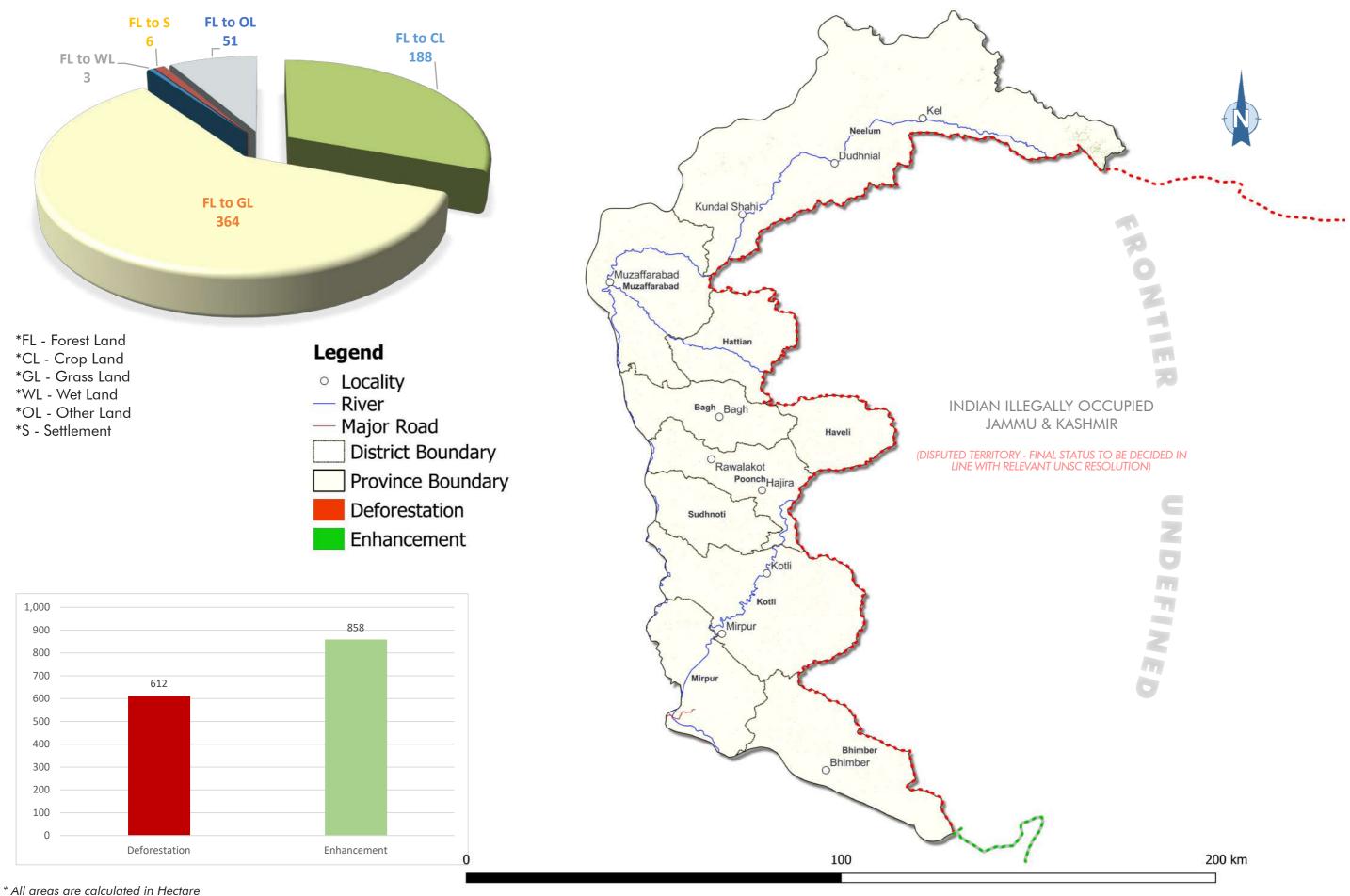
Land cover	Туре	Area (ha)	Forest Type	Area (ha)
	Forest	618,460	Sub-Alpine	4,355
	Cropland	130,841	Moist-Temperate	251,692
	Grassland	223,730	Chir Pine	190,944
	Wetland	23,925	Dry-Temperate	19,323
	Settlement	11,239	Scrub	151,694
	Other land	321,504	Thorn	451



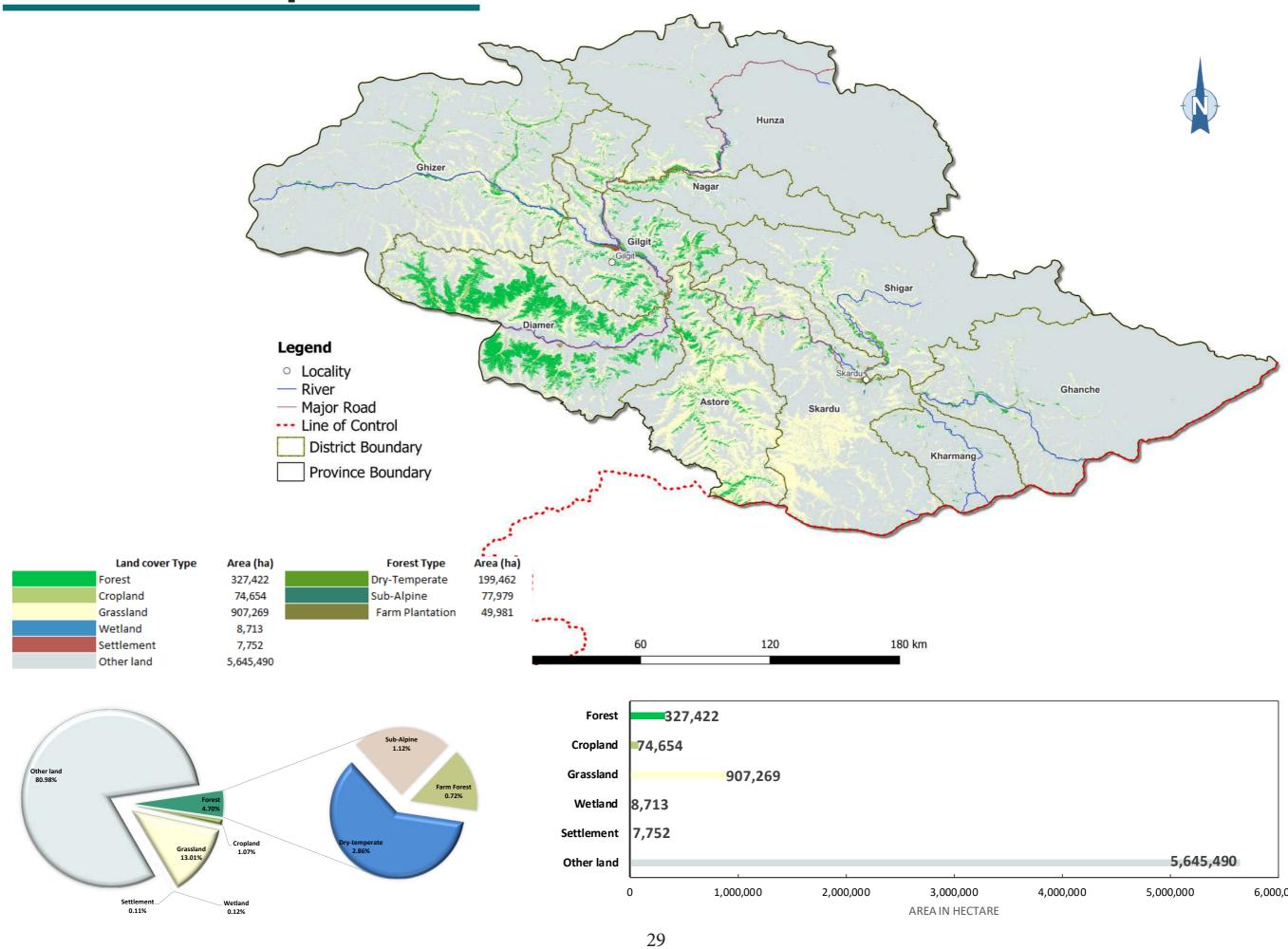




Change Detection Map of AJ&K (2016-2020)

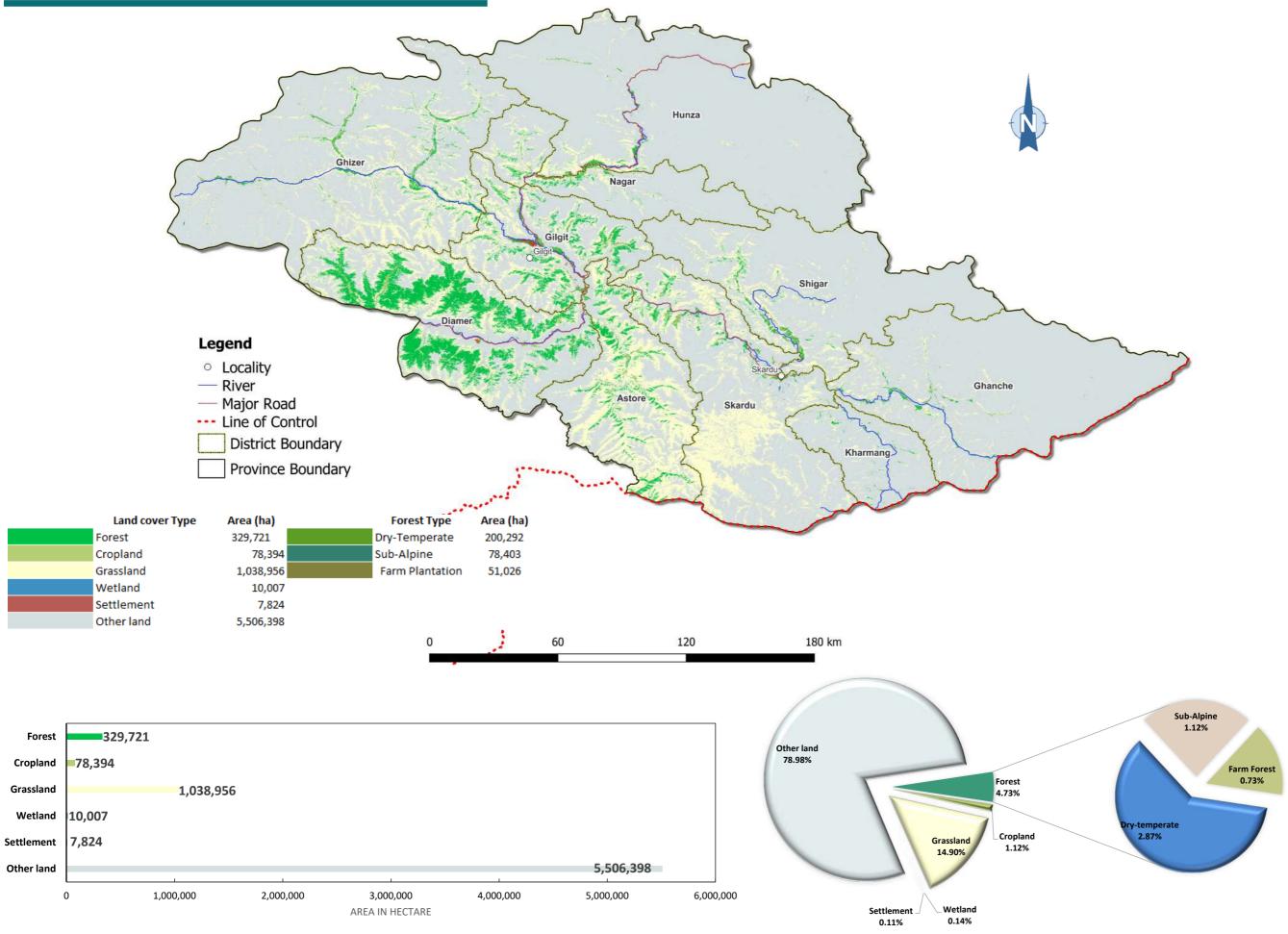


GB LULC Map - 2016



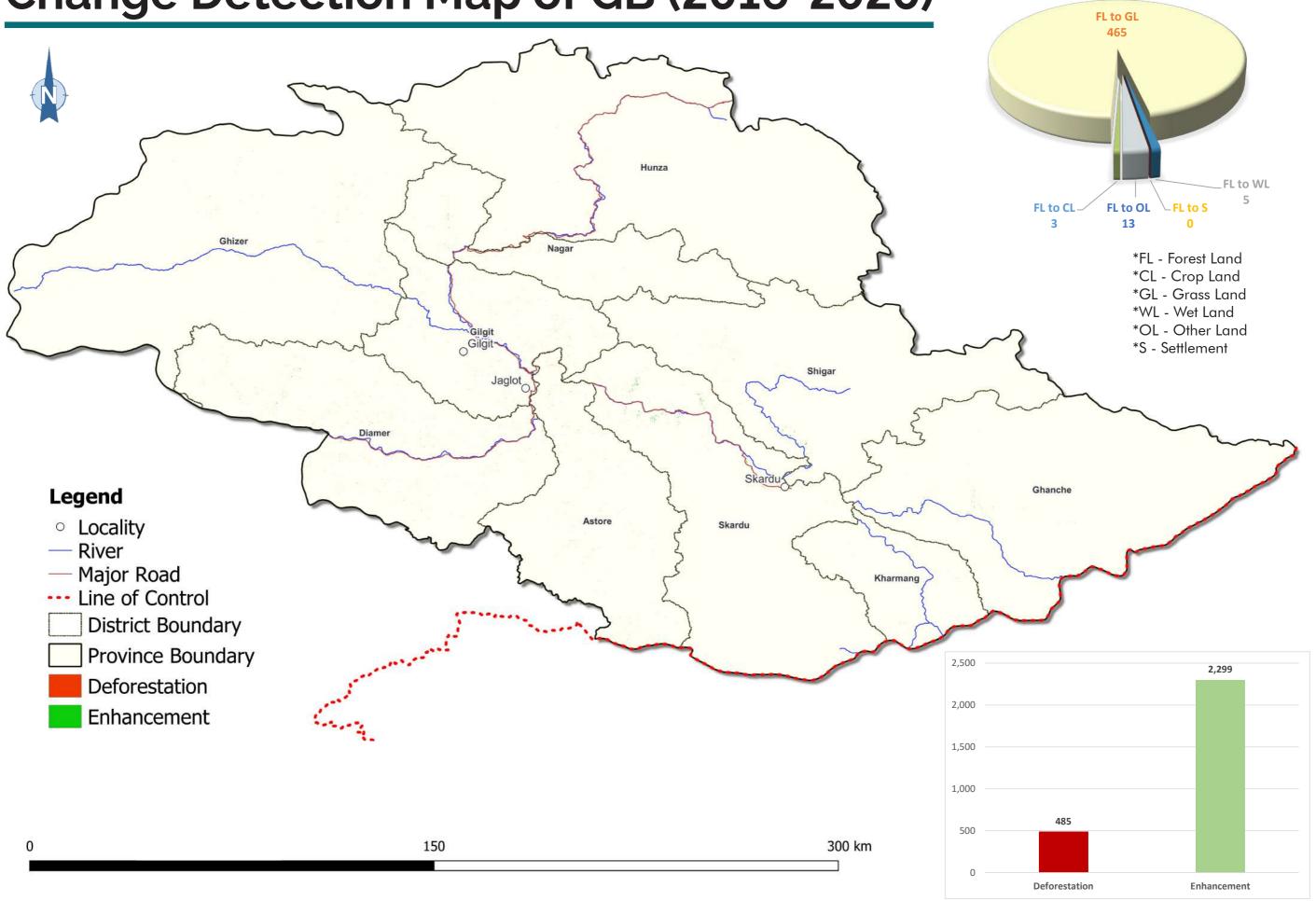


GB LULC Map - 2020





Change Detection Map of GB (2016-2020)



^{*} All areas are calculated in Hectare

