United Nations Convention to Combat Desertification
Performance review and assessment of implementation system
Seventh reporting process

Report from Bhutan

4 March 2023

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SO1-1 Trends in land cover

Land area

SO1-1.T1: National estimates of the total land area, the area covered by water bodies and total country area

Year	Total land area (km²)	Water bodies (km²)	Total country area (km²)	Comments
2001	38 749	13	38 762	The sources were completed. The total country area that is currently officially used is 38,394 sq km. This estimation is currently being revised by the country and the estimated total country area in the national land cover map is 38,762 sq km. However, the default estimation was 38,688 sq km. So, for PRASI4, the country used national borders and a national map to estimate the total land area to include a more realistic number. Source: Land Cover Mapping Project (LCMP) 2010. National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt)
2005	38 749	13	38 762	The sources were completed. The total country area that is currently officially used is 38,394 sq km. This estimation is currently being revised by the country and the estimated total country area in the national land cover map is 38,762 sq km. However, the default estimation was 38,688 sq km. So, for PRASI4, the country used national borders and a national map to estimate the total land area to include a more realistic number. Source: Land Cover Mapping Project (LCMP) 2010. National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt)
2010	38 749	13	38 762	The sources were completed. The total country area that is currently officially used is 38,394 sq km. This estimation is currently being revised by the country and the estimated total country area in the national land cover map is 38,762 sq km. However, the default estimation was 38,688 sq km. So, for PRASI4, the country used national borders and a national map to estimate the total land area to include a more realistic number. Source: Land Cover Mapping Project (LCMP) 2010. National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt)
2015	38 749	13	38 762	The sources were completed. The total country area that is currently officially used is 38,394 sq km. This estimation is currently being revised by the country and the estimated total country area in the national land cover map is 38,762 sq km. However, the default estimation was 38,688 sq km. So, for PRASI4, the country used national borders and a national map to estimate the total land area to include a more realistic number. Source: Land Cover Mapping Project (LCMP) 2010. National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt)
2019	38 749	13	38 762	The sources were completed. The total country area that is currently officially used is 38,394 sq km. This estimation is currently being revised by the country and the estimated total country area in the national land cover map is 38,762 sq km. However, the default estimation was 38,688 sq km. So, for PRASI4, the country used national borders and a national map to estimate the total land area to include a more realistic number. Source: Land Cover Mapping Project (LCMP) 2010. National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt)

Land cover legend and transition matrix

SO1-1.T2: Key Degradation Processes

Degradation Process	Starting Land Cover	Ending Land Cover
Other Urbanization/Infrastructure Development	Other Croplands, Forest lands	Other Artificial (settlements, infrastructure)
Other Disasters (flashfloods, landslides, earthquake, forest fire)	Other Crop lands, Forest lands, Artificial (settlements)	Other Other lands (barren and degraded)
Deforestation	Other Forest lands	Other Other lands (crop lands, artificial)

Degradation Process	Starting Land Cover	Ending Land Cover
Other Unsustainable agricultural practices	Croplands	Other Other lands (landslides, gullies, artificial)
Other Over grazing	Other Grasslands, Forest lands	Other Other lands (landslides, gullies, artificial)
Woody Encroachment	Other Crop lands, Grasslands, Forest lands	Other Shrublands

Are the seven UNCCD land cover classes sufficient to monitor the key degradation processes in your country?

- ○ Yes
- ◉ No

SO1-1.T3: Land Cover Legend

Country legend class	Country legend class code	UNCCD legend class
Forests	1	Tree-covered areas
Shrublands	2	Grasslands
Grasslands	3	Grasslands
Croplands	4	Croplands
Artificial	5	Artificial surfaces
Other lands	6	Other Lands
Water bodies	7	Water bodies

SO1-1.T4: Country Land Cover Legend Transition Matrix

Original/ Final	Forests	Shrublands	Grasslands	Croplands	Artificial	Other lands	Water bodies
Forests	0	-	-	-	-	-	0
Shrublands	+	0	+	+	-	-	+
Grasslands	+	-	0	+	-	-	0
Croplands	+	-	-	0	-	-	0
Artificial	+	+	+	+	0	-	+
Other lands	+	+	+	+	-	0	+
Water bodies	0	-	0	0	-	-	0

Degradation	Improvement	Stable
-	+	0

Land cover

SO1-1.T5: National estimates of land cover (km²) for the baseline and reporting period

	Forests	Shrublands	Grasslands	Croplands	Artificial	Other lands	Water bodies	No data (km²)
2000	29 030	2 241	5 772	557	0	1 149	13	
2001								
2002								
2003								
2004								

	Forests	Shrublands	Grasslands	Croplands	Artificial	Other lands	Water bodies	No data (km²)
2005								
2006								
2007								
2008								
2009								
2010								
2011								
2012								
2013								
2014								
2015	29 419	1 837	5 775	567	3	1 149	13	
2016								
2017								
2018								
2019	29 426	1 842	5 783	545	3	1 149	13	
2020								

Land cover change

SO1-1.T6: National estimates of land cover change (km²) for the baseline period

	Forests	Shrublands	Grasslands	Croplands	Artificial	Other lands	Water bodies	Total (km²)
Forests	28 925	61	23	20	0	0	1	29 030
Shrublands	459	1 775	3	4	1	0	0	2 242
Grasslands	22	1	5 749	0	0	0	0	5 772
Croplands	13	0	0	543	1	0	0	557
Artificial	0	0	0	0	0	0	0	0
Other lands	0	0	0	0	0	1 149	0	1 149
Water bodies	0	0	0	0	0	0	13	13
Total	29 419	1 837	5 775	567	2	1 149	14	

SO1-1.T7: National estimates of land cover change (km²) for the reporting period

	Forests	Shrublands	Grasslands	Croplands	Artificial	Other lands	Water bodies	Total land area (km²)
Forests	29 350	46	20	3	0	0	0	29 419
Shrublands	40	1 794	2	0	0	0	0	1 836
Grasslands	13	1	5 761	0	0	0	0	5 775
Croplands	24	1	0	542	0	0	0	567
Artificial	0	0	0	0	3	0	0	3
Other lands	0	0	0	0	0	1 149	0	1 149
Water bodies	0	0	0	0	0	0	13	13
Total	29 427	1 842	5 783	545	3	1 149	13	

Land cover degradation

SO1-1.T8: National estimates of land cover degradation (km²) in the baseline period

	Area (km²)	Percent of total land area (%)
Land area with degraded land cover	107 .8	0 .3
Land area with non-degraded land cover	38 654 .2	99 .7
Land area with no land cover data	0	0 .0

SO1-1.T9: National estimates of land cover degradation (km²) in the reporting period

	Area (km²)	Percent of total land area (%)
Land area with improved land cover	78 .5	0 .2
Land area with stable land cover	38 611	99 .6
Land area with degraded land cover	72 .5	0 .2
Land area with no land cover data	0	0 .0

General comments

The official total country area that is currently in use is 38,394 sq km. However, for SO1, country used national borders and national map which leads to an estimation of 38,762 sq km for total country area. This estimation is currently being revised by the country. Source: Land Cover Mapping Project (LCMP) 2010 report of the National Soil Services Centre, Department of Agriculture, Ministry of Agriculture & Livestock, Website: www.nssc.gov.bt Data source for Land Cover Transition is ESA CCI land cover map which was reclassified according to the participatory workshop where experts from different institutions defined in a participatory way the most appropriate legend and data source to map degradation due to cover changes in Bhutan and identified which land cover changes correspond to either degradation, improvement or neutral transitions (transition matrix) and obtain the final map of degradation due to land cover changes integrating national experts' knowledge. For more information please refer to the LDN Decision support system https://wocatapps.users.earthengine.app/view/dss-bhutan and https://www.wocat.net/library/media/274/

SO1-2 Trends in land productivity or functioning of the land

Land productivity dynamics

SO1-2.T1: National estimates of land productivity dynamics (in km²) within each land cover class for the baseline period

Land cover class	Net land productivity dynamics (km²) for the baseline period					
	Declining (km²)	Moderate Decline (km²)	Stressed (km²)	Stable (km²)	Increasing (km²)	No Data (km²)
Tree-covered areas	1 072 .51	2 034 .60	3 232 .09	18 649 .40	4 435 .43	
Grasslands	150 .29	1 052 .25	2 039 .98	3 057 .90	1 292 .10	
Croplands	55 .05	97 .17	46 .73	300 .84	71 .49	
Wetlands	0	0	0	0	0	
Artificial surfaces	0 .58	0 .33	0 .53	0 .59	0 .4	
Other Lands	2 .77	49 .52	107 .15	947 .91	32 .74	
Water bodies	0 .32	1 .08	1 .11	3 .18	3 .38	

SO1-2.T2: National estimates of land productivity dynamics (in km²) within each land cover class for the reporting period.

Land cover class	Net land productivity dynamics (km²) for the reporting period					
	Declining (km²)	Moderate Decline (km²)	Stressed (km²)	Stable (km²)	Increasing (km²)	No Data (km²)
Tree-covered areas	781 .28	2 748 .12	3 473 .08	16 846 .15	5 585 .54	
Grasslands	119 .72	1 359 .96	1 982 .62	3 028 .58	1 112 .84	
Croplands	25 .77	56 .51	31 .53	327 .80	108 .17	
Wetlands	0	0	0	0	0	
Artificial surfaces	0	0 .64	0 .42	0 .97	0 .40	
Other Lands	4 .27	78 .54	136 .12	904 .68	16 .71	
Water bodies	0 .12	0 .72	1 .43	4 .06	2 .67	

SO1-2.T3: National estimates of land productivity dynamics for areas where a land conversion to a new land cover class has taken place (in km²) for the baseline period.

Land Conversion		Net land productivity dynamics (km²) for the baseline period					
From	To	Net area change (km²)	Declining (km²)	Moderate Decline (km²)	Stressed (km²)	Stable (km²)	Increasing (km²)
Tree-covered areas	Grasslands	84 .7	7	11 .4	9 .4	40 .3	16 .6
Tree-covered areas	Croplands	20 .9	1 .5	4 .1	0 .7	11 .6	3
Grasslands	Tree-covered areas	479 .7	14 .3	21 .3	49 .5	277 .5	117 .1
Grasslands	Croplands	4 .5	1 .8	1 .4	0 .2	1 .0	0 .1

SO1-2.T4: National estimates of land productivity dynamics for areas where a land conversion to a new land cover class has taken place (in km²) for the reporting period.

Land Conversion		Net land productivity dynamics (km²) for the reporting period					
From	To	Net area change (km²)	Declining (km²)	Moderate Decline (km²)	Stressed (km²)	Stable (km²)	Increasing (km²)
Tree-covered areas	Grasslands	64 .5	2 .6	10 .8	7 .9	33 .8	9 .4
Grasslands	Tree-covered areas	54 .1	1 .8	3 .9	3	32 .6	12 .8
Croplands	Tree-covered areas	23 .5	0 .9	1 .5	0 .1	14 .8	6 .2
Tree-covered areas	Croplands	3 .2	0 .6	1	0 .1	1 .3	0 .2

Land Productivity degradation

SO1-2.T5: National estimates of land productivity degradation in the baseline period

	Area (km²)	Percent of total land area (%)
Land area with degraded land productivity	4 521 .24	11 .7
Land area with non-degraded land productivity	34 224 .14	88 .3
Land area with no land productivity data	0	0 .0

SO1-2.T6: National estimates of land productivity degradation in the reporting period

	Area (km²)	Percent of total land area (%)
Land area with improved land productivity	6 829 .25	17 .6
Land area with stable land productivity	26 743 .59	69 .0
Land area with degraded land productivity	5 172 .54	13 .3
Land area with no land productivity data	0	0 .0

General comments

The Land Productivity Map that was used is the FAO-WOCAT LPD map (https://www.wocat.net/library/media/272/). This map was chosen by a group of experts from multiple government institutions following a comparative analysis using a cloud based tool (https://wocatapps.users.earthengine.app/view/dss-bhutan-lpd). Areas with forest fires, forest with beetle infestations, timber extraction, settlements development, sustainable land management and mining sites were identified and results from the different LPD maps (JRC, Trends.Earth, FAO-WOCAT) were compared. The most representative map was the one chosen for this report. More details can be found in the final Report (which will be shared with the UNCCD in March 2023). For more information visit: https://www.wocat.net/library /media/274/

SO1-3 Trends in carbon stocks above and below ground

Soil organic carbon stocks

SO1-3.T1: National estimates of the soil organic carbon stock in topsoil (0-30 cm) within each land cover class (in tonnes per hectare).

Year	Soil organic carbon stock in topsoil (t/ha)						
	Tree-covered areas	Grasslands	Croplands	Wetlands	Artificial surfaces	Other Lands	Water bodies
2000	91 .64	90 .54	59 .61	0	51 .99	97 .78	73 .50
2001							
2002							
2003							
2004							
2005							
2006							
2007							
2008							
2009							
2010							
2011							
2012							
2013							
2014							
2015	91 .44	91 .33	59 .56	0	53 .12	97 .78	74 .61
2016							
2017							
2018							
2019	91 .37	91 .48	60 .07	0	53 .12	97 .78	75 .06
2020							

If you opted not to use default Tier 1 data, what did you use to calculate the estimates above?

- ○ Modified Tier 1 methods and data
- ◉ Tier 2 (additional use of country-specific data)
- ○ Tier 3 (more complex methods involving ground measurements and modelling)

SO1-3.T2: National estimates of the change in soil organic carbon stock in soil due to land conversion to a new land cover class in the baseline period

Land Conversion		Soil organic carbon (SOC) stock change in the baseline period					
From	To	Net area change (km²)	Initial SOC stock (t/ha)	Final SOC stock (t/ha)	Initial SOC stock total (t)	Final SOC stock total (t)	SOC stock change (t)
Tree-covered areas	Grasslands	84 .7	91 .6	90 .5	776 190 .8	766 873 .8	-9 317
Grasslands	Tree-covered areas	479 .7	90 .5	91 .6	4 343 203 .8	4 395 970 .8	52 767
Tree-covered areas	Croplands	20 .9	91 .6	59 .6	191 527 .6	124 584 .9	-66 942 .70000000001

Land Conversion		Soil organic carbon (SOC) stock change in the baseline period					
From	To	Net area change (km²)	Initial SOC stock (t/ha)	Final SOC stock (t/ha)	Initial SOC stock total (t)	Final SOC stock total (t)	SOC stock change (t)
Croplands	Tree-covered areas	75	144 .9	164 .9	1 087 054	1 236 597	149 543

SO1-3.T3: National estimates of the change in soil organic carbon stock in soil due to land conversion to a new land cover class in the reporting period

Land Conversion		Soil organic carbon (SOC) stock change in the reporting period					
From	To	Net area change (km²)	Initial SOC stock (t/ha)	Final SOC stock (t/ha)	Initial SOC stock total (t)	Final SOC stock total (t)	SOC stock change (t)
Tree-covered areas	Grasslands	64 .5	91 .6	90 .5	591 078	583 983	-7 095
Grasslands	Tree-covered areas	54 .1	90 .5	91 .6	489 821 .4	495 772 .4	5 951
Tree-covered areas	Croplands	3 .2	91 .6	59 .6	29 324 .8	19 075 .2	-10 249 .599999999999
Croplands	Grasslands	1 .53	59 .6	90 .5	9 120 .3	13 852 .6	4 732 .300000000001

Soil organic carbon stock degradation

SO1-3.T4: National estimates of soil organic carbon stock degradation in the baseline period

	Area (km²)	Percent of total land area (%)
Land area with degraded soil organic carbon (SOC)	36	0 .1
Land area with non-degraded SOC	36 498	94 .2
Land area with no SOC data	2 139	5 .5

SO1-3.T5: National estimates of SOC stock degradation in the reporting period

	Area (km²)	Percent of total land area (%)
Land area with improved SOC	0	0 .0
Land area with stable SOC	36 533	94 .3
Land area with degraded SOC	2	0 .0
Land area with no SOC data	2 139	5 .5

General comments

The SOC stocks per land cover were estimated using a national SOC map with 250m spatial resolution produced by digital soil mapping using a Quantile Regression Forest model and 1809 sample points collected within a period from late 1990's to 2022 which were mostly (≈95%) from cultivated/cropland. The laboratory analysis used was the Walkley-Black method. The National SOC map has higher uncertainties in other lands and grasslands. For SOC transitions the Tier 2 approach was used. Tables SO1-3-T2 and SO1-3-T3 were estimated using national stock values and transition areas. The SOC stock changes should be validated and are probably overestimated. For more information visit: https://www.wocat.net/library/media/274/

SO1-4 Proportion of degraded land over the total land area

Proportion of degraded land over the total land area (Sustainable Development Goal Indicator 15.3.1)

SO1-4.T1: National estimates of the total area of degraded land (in km²), and the proportion of degraded land relative to the total land area

	Total area of degraded land (km²)	Proportion of degraded land over the total land area (%)
Baseline Period	4 607 .57	11 .9
Reporting Period	5 227 .4	13 .5
Change in degraded extent	619.83	

Method

Did you use the SO1-1, SO1-2 and SO1-3 indicators (i.e. land cover, land productivity dynamics and soil organic carbon stock) to compute the proportion of degraded land?

Which indicators did you use?

☒ Land Cover
☒ Land Productivity Dynamics
☒ SOC Stock

Did you apply the one-out, all-out principle to compute the proportion of degraded land?

◉ Yes
○ No

Level of Confidence

Indicate your country's level of confidence in the assessment of the proportion of degraded land:

○ High (based on comprehensive evidence)
◉ Medium (based on partial evidence)
○ Low (based on limited evidence)

Describe why the assessment has been given the level of confidence selected above:

For each sub-indicator the best available information was used based on decisions made by a multi-sectoral group of experts during a participatory workshop. However, there is still room for improvement. For trends in land cover, even though a national legend was used, different from the default one, ESA CCI land cover maps were used a source of data. National land cover and land use maps are being developed and would improve these assessments. For land productivity dynamics, an alternative LPD map was used and verified but still more validation and adjustments are planned for the future. Finally for SOC change, a national map was used for SOC stocks but a different model to estimate changes in time could improve the estimation.

False positives/ False negatives

SO1-4.T3: Justify why any area identified as degraded or non-degraded in the SO1-1, SO1-2 or SO1-3 indicator data should or should not be included in the overall Sustainable Development Goal indicator 15.3.1 calculation.

Location Name	Type	Recode Options	Area (km²)	Process driving false +/- outcome	Basis for Judgement	Edit Polygon
Wangphu gewog	False Positive		0 .15	According to the SO1-1 degradation map there is a positive land cover change, from grasslands to forest land, which did not actually take place in Wangphu gewog.	Other Expert mapping using LDN DSS	
Wangphu gewog	False Negative		1 .2	Corresponds to top mountain areas covered with forests in Wangphu geowog that are not degraded.	Other Expert mapping using LDN DSS	

Location Name	Type	Recode Options	Area (km²)	Process driving false +/- outcome	Basis for Judgement	Edit Polygon
Nationwide	False Positive		14 .4	These areas are hotspots of degradation due to active mining, landslides or other processes.	Other Multicriteria analysis using the LDN DSS and national map of restoration activities in mining areas	
Nationwide	False Negative		0 .25	Restoration works have been taking place with results at field level	Other Multicriteria analysis using the LDN DSS and national map of restoration activities in mining areas	

Perform qualitative assessments of areas identified as degraded or improved

SO1-4.T4: Degradation hotspots

Hotspots	Location	Area (km²)	Assessment Process	Direct drivers of land degradation hotspots	Action(s) taken to redress degradation in terms of Land Degradation Neutrality response hierarchy	Remediating action(s) (both forward-looking and current)	Edit Polygon

Degraded and barren areas in Bhutan with high suitability for restoration	Nationwide	5 .8	Site-based data	1. Deforestation and clearance of other native vegetation
				2. Fire regime change
				3. Grazing land management
				4. Mineral resource extraction
					☐ Avoid
					☒ Reduce
					☒ Reverse
						• Restore/improve protected areas
						  ◦ Restore protected areas
						• Restore/improve multiple land uses
						• Restore/improve tree-covered areas
						  ◦ Restore tree-covered areas
						• Increase tree-covered area extent
						  ◦ Increase tree covered land (net gain) e.g. plantations
						• Restore/improve multiple functions
						• Increase soil fertility and carbon stock
						  ◦ Rehabilitate bare land and/or restore degraded land	

Total no. of hotspots	4						
Total hotspot area	102 .5						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Hotspots	Location	Area (km²)	Assessment Process	Direct drivers of land degradation hotspots	Action(s) taken to redress degradation in terms of Land Degradation Neutrality response hierarchy	Remediating action(s) (both forward-looking and current)	Edit Polygon

Degraded and barren areas in Bhutan with moderate suitability for restoration	Nationwide	44 .2	Site-based data	1. Deforestation and clearance of other native vegetation
				2. Grazing land management
				3. Fire regime change
				4. Mineral resource extraction
					☐ Avoid
					☒ Reduce
					☒ Reverse
						• General instrument (e.g. policies, economic incentives)
						• Restore/improve protected areas
						  ◦ Restore protected areas
						• Restore/improve tree-covered areas
						  ◦ Restore tree-covered areas
						• Increase tree-covered area extent
						  ◦ Increase tree covered land (net gain) e.g. plantations
						• Restore/improve multiple functions
						• Increase soil fertility and carbon stock
						  ◦ Reduce soil erosion
						  ◦ Rehabilitate bare land and/or restore degraded land	

Total no. of hotspots	4						
Total hotspot area	102 .5						

Hotspots	Location	Area (km²)	Assessment Process	Direct drivers of land degradation hotspots	Action(s) taken to redress degradation in terms of Land Degradation Neutrality response hierarchy	Remediating action(s) (both forward-looking and current)	Edit Polygon
Active mining sites in Bhutan	Nationwide	14 .9	Site-based data	Mineral resource extraction	☐ Avoid ☒ Reduce ☒ Reverse	• Restore/improve grasslands ◦ Restore rangeland (e.g. by controlling livestock and wildfires) ◦ Improve land productivity in grasslands • Manage artificial surfaces ◦ Restore degraded mining areas ◦ Improve land productivity on artificial surfaces • Restore/improve tree-covered areas ◦ Reduce/halt deforestation and conversion of tree cover to other land cover types (e.g. conserving forest land) ◦ Restore/improve grasslands ◦ Increase land productivity in tree covered areas ◦ Restore tree-covered areas	
Total no. of hotspots	4						
Total hotspot area	102 .5						

Hotspots	Location	Area (km²)	Assessment Process	Direct drivers of land degradation hotspots	Action(s) taken to redress degradation in terms of Land Degradation Neutrality response hierarchy	Remediating action(s) (both forward-looking and current)	Edit Polygon
Landslides in Bhutan	Nationwide	37 .6	Site-based data	1. Deforestation and clearance of other native vegetation 2. Grazing land management 3. Cropland and agroforestry management 4. Mineral resource extraction 5. Infrastructure, industry and urbanization 6. Climate change	☒ Avoid ☒ Reduce ☒ Reverse	• Restore/improve croplands ◦ Practise sustainable land management ◦ Improve water use for irrigation ◦ Halt/reduce conversion of cropland to other land cover types ◦ Increase land productivity in agricultural areas ◦ Rehabilitate bare or degraded land for crop production • Restore/improve grasslands ◦ Restore rangeland (e.g. by controlling livestock and wildfires) ◦ Restore and improve pastures ◦ Halt/reduce conversion of grassland to other land cover types ◦ Improve land productivity in grasslands • Manage artificial surfaces ◦ Restore degraded mining areas ◦ Improve land productivity on artificial surfaces ◦ Halt/reduce/regulate expansion of urban/artificial surfaces • Restore/improve protected areas ◦ Restore protected areas ◦ Improve management of protected areas • Restore/improve multiple land uses • Restore/improve tree-covered areas ◦ Reduce/halt deforestation and conversion of tree cover to other land cover types (e.g. conserving forest land) ◦ Restore tree-covered	
Total no. of hotspots	4						
Total hotspot area	102 .5						

Hotspots	Location	Area (km²)	Assessment Process	Direct drivers of land degradation hotspots	Action(s) taken to redress degradation in terms of Land Degradation Neutrality response hierarchy	Remediating action(s) (both forward-looking and current)	Edit Polygon
						areas • Increase tree-covered area extent ◦ Increase tree covered land (net gain) e.g. plantations • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	
Total no. of hotspots	4						
Total hotspot area	102 .5						

What is/are the indirect driver(s) of land degradation at the national level?

1. Demographic
2. Economic

SO1-4.T5: Improvement brightspots

Brightspots	Location	Area (km²)	Assessment Process	What action(s) led to the brightspot in terms of the Land Degradation Neutrality hierarchy?	Implementing action(s) (both forward-looking and current)	Edit Polygon
Total no. of brightpots		1				
Total brightspot area		0 .6				

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Brightspots	Location	Area (km²)	Assessment Process	What action(s) led to the brightspot in terms of the Land Degradation Neutrality hierarchy?	Implementing action(s) (both forward-looking and current)	Edit Polygon

Restoration sites	Nationwide	0 .6	Site-based data	☐ Avoid
				☐ Reduce
				☒ Reverse
					• Restore/improve grasslands
					  ◦ Improve land productivity in grasslands
					• Manage artificial surfaces
					  ◦ Restore degraded mining areas
					  ◦ Improve land productivity on artificial surfaces
					• Restore/improve tree-covered areas
					  ◦ Restore/improve grasslands
					  ◦ Increase land productivity in tree covered areas
					  ◦ Restore tree-covered areas
					• Increase tree-covered area extent
					  ◦ Increase tree covered land (net gain) e.g. plantations
						Polygon

Total no. of brightpots		1				
Total brightspot area		0 .6				

What are the enabling and instrumental responses at the national level driving the occurrence of brightspots?

Legal and regulatory instruments

General comments

We couldn't upload hotspots and the false positive and false negative spatial layers as there were technical problem with the platform, such as too many vertices which are restricted by the system. SO1-4-T3 - it was not possible to upload the shapefile with FALSE POSITIVES AND NEGATIVES. It can be accessed here: https://drive.google.com/file/d/1fyO0jT9244JUJtYonrmYjubuHFnJ0imc/view?usp=share_link SO1-4-T4 - It was not possible to upload the shapefile with HOTSPOTS. The geolocation of reported HOTSPOTS (shapefile) can be accessed here: https://drive.google.com/file/d/1jWN0SOOdUCjwcUCNtkS9rEXt0yG6cG2j/view?usp=share_link They can also be visualized in the LDN DSS at https://wocatapps.users.earthengine.app/view/dss-bhutan For more information contact: Mr. Tashi Wangdi, National Focal Point, National Soil Services Centre, Royal Government of Bhutan and/or check the LDN Decision Support System of Bhutan: https://wocatapps.users.earthengine.app/view/dss-bhutan

SO1 Voluntary Targets

SO1-VT.T1: Voluntary Land Degradation Neutrality targets and other targets relevant to strategic objective 1

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
By 2025, SLM measures will be implemented as identified in the NAP on 35.07 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha.	2025	Jarey gewog, Lhuentse District	137 .9	☒ Avoid ☒ Reduce ☒ Reverse	• Restore/improve croplands ◦ Practise sustainable land management ◦ Improve water use for irrigation ◦ Halt/reduce conversion of cropland to other land cover types ◦ Increase land productivity in agricultural areas ◦ Rehabilitate bare or degraded land for crop production • Restore/improve tree-covered areas ◦ Increase land productivity in tree covered areas ◦ Restore tree-covered areas • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	Polygon
Total			Sum of all targeted areas 314 .03						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
By 2025, SLM measures will be implemented as identified in the NAP on 35.07 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha.	2030	Wangphu gewog, Samdrup Jongkhar District	79 .7	☒ Avoid ☒ Reduce ☒ Reverse	• Restore/improve croplands ◦ Practise sustainable land management ◦ Improve water use for irrigation ◦ Halt/reduce conversion of cropland to other land cover types ◦ Increase land productivity in agricultural areas ◦ Rehabilitate bare or degraded land for crop production • Restore/improve tree-covered areas ◦ Restore/improve grasslands ◦ Restore tree-covered areas • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	Polygon
By 2025, SLM measures will be implemented as identified in the NAP on 35.07 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha.	2025	Thangrong gewog, Mongar District	68 .5	☒ Avoid ☒ Reduce ☒ Reverse	• Restore/improve croplands ◦ Practise sustainable land management ◦ Improve water use for irrigation ◦ Halt/reduce conversion of cropland to other land cover types ◦ Increase land productivity in agricultural areas ◦ Rehabilitate bare or degraded land for crop production • Restore/improve tree-covered areas ◦ Restore tree-covered areas • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	Polygon
Total			Sum of all targeted areas 314 .03						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
• By 2030, wood substitute products will be promoted with subsidies and further declines in productivity will be avoided.	2030	Nation wide	0	☒ Avoid ☒ Reduce ☐ Reverse	• General instrument (e.g. policies, economic incentives) • Restore/improve tree-covered areas ◦ Reduce/halt deforestation and conversion of tree cover to other land cover types (e.g. conserving forest land) ◦ Restore tree-covered areas • Increase tree-covered area extent ◦ Increase tree covered land (net gain) e.g. plantations	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • Bonn Challenge • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
• By 2025, improved pasture will be promoted on 0.50 km2. In the meantime, and beyond, by 2030, improved breeds will be promoted.	2030	Nation wide	0 .50	☒ Avoid ☒ Reduce ☐ Reverse	• Restore/improve grasslands ◦ Restore rangeland (e.g. by controlling livestock and wildfires) ◦ Restore and improve pastures ◦ Halt/reduce conversion of grassland to other land cover types ◦ Improve land productivity in grasslands • Restore productivity and soil organic carbon stock in croplands and grasslands • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Maintain the current level of SOC ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
Total			Sum of all targeted areas 314 .03						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
• By 2035, reforestation with native species in open areas will be realized on 25.00 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha by 2030.	2030	Nation wide	25 .00	☒ Avoid ☒ Reduce ☒ Reverse	• Manage artificial surfaces ◦ Restore degraded mining areas ◦ Halt illegal mining and/or reduce mining areas ◦ Improve land productivity on artificial surfaces ◦ Halt/reduce/regulate expansion of urban/artificial surfaces • Restore/improve protected areas ◦ Restore protected areas ◦ Improve management of protected areas • Restore/improve tree-covered areas ◦ Reduce/halt deforestation and conversion of tree cover to other land cover types (e.g. conserving forest land) ◦ Increase land productivity in tree covered areas ◦ Restore tree-covered areas ◦ Improve tree cover management e.g. fire management • Increase tree-covered area extent • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Maintain the current level of SOC ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • Bonn Challenge • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
• By 2040, the RAMSAR framework will be set up on 1.83 km2	2040	Potential Ramsar sites	1 .83	☒ Avoid ☒ Reduce ☐ Reverse	• Restore/improve wetlands ◦ Restore/preserve wetlands and reduce degradation of wetlands ◦ Halt/reduce wetland conversion to other land uses (includes conserving wetlands) • Restore/improve protected areas ◦ Restore protected areas ◦ Improve management of protected areas	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
Total			Sum of all targeted areas 314 .03						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
• By 2035, plantations in open areas will be realized on 0.10 km2.	2035	Nation wide	0 .10	☒ Avoid ☒ Reduce ☒ Reverse	• Restore/improve protected areas ◦ Restore protected areas ◦ Improve management of protected areas • Restore/improve tree-covered areas ◦ Reduce/halt deforestation and conversion of tree cover to other land cover types (e.g. conserving forest land) ◦ Increase land productivity in tree covered areas ◦ Restore tree-covered areas ◦ Improve tree cover management e.g. fire management • Increase tree-covered area extent ◦ Increase tree covered land (net gain) e.g. plantations • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Maintain the current level of SOC ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • Bonn Challenge • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
Total			Sum of all targeted areas 314 .03						

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Target	Year	Location(s)	Total Target Area (km²)	Overarching type of Land Degradation Neutrality (LDN) intervention	Targeted action(s)	Status of target achievement	Is this an LDN target? If so, under which process was it defined/adopted?	Which other important goals are also being addressed by this target?	Edit Polygon
• By 2035, restoration/reclamation of degraded areas will be realized on 0.50 km2	2035	Nation wide	0 .50	☐ Avoid ☐ Reduce ☒ Reverse	• Restore/improve protected areas ◦ Restore protected areas ◦ Improve management of protected areas • Restore/improve tree-covered areas ◦ Increase land productivity in tree covered areas ◦ Restore tree-covered areas ◦ Improve tree cover management e.g. fire management • Increase tree-covered area extent ◦ Increase tree covered land (net gain) e.g. plantations • Increase soil fertility and carbon stock ◦ Reduce soil erosion ◦ Maintain the current level of SOC ◦ Improve watershed/landscape management ◦ Rehabilitate bare land and/or restore degraded land ◦ Increase carbon stock and reduce soil/land degradation	Ongoing	◉ Yes ○ No LDN pilot project	• Convention on Biological Diversity – National Biodiversity Strategies and Action Plans & National Targets • Bonn Challenge • United Nations Framework Convention on Climate Change – Nationally Determined Contributions	
Total			Sum of all targeted areas 314 .03						

SO1.IA.T1: Areas of implemented action related to the targets (projects and initiatives on the ground).

Relevant Target	Implemented Action	Location (placename)	Action start date	Extent of action	Total Area Implemented So Far (km²)	Edit Polygon
By 2025, SLM measures will be implemented as identified in the NAP on 35.07 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha.	Other Hedgerows, contour stone bunds, check dams, plantations and bench terracing	Jarey, Thangrong and Wangphu gewogs	2015-07-15	286 .1	286 .10	
• By 2025, improved pasture will be promoted on 0.50 km2. In the meantime, and beyond, by 2030, improved breeds will be promoted.	Same As Targeted Actions	Nation wide	2015-07-01	325 .78	325 .78	
• By 2035, reforestation with native species in open areas will be realized on 25.00 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha by 2030.	Same As Targeted Actions	Nation wide	2015-07-01	12 .66	12 .66	
• By 2035, restoration/reclamation of degraded areas will be realized on 0.50 km2	Other Restoration of mining sites	Nation wide	2015-01-01	1 .52	1 .52	

SO-1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.

Relevant Target	Implemented Action	Location (placename)	Action start date	Extent of action	Total Area Implemented So Far (km²)	Edit Polygon
					Sum of all areas relevant to actions under the same target	
					By 2025, SLM measures will be implemented as identified in the NAP on 35.07 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha.: 0.00	
					• By 2030, wood substitute products will be promoted with subsidies and further declines in productivity will be avoided.: 0.00	
					• By 2025, improved pasture will be promoted on 0.50 km2. In the meantime, and beyond, by 2030, improved breeds will be promoted.: 325.78	
					• By 2035, reforestation with native species in open areas will be realized on 25.00 km2. In addition, further productivity decline will be avoided through various means and SOC will be maintained at 50 ton/ha by 2030.: 12.66	
					• By 2040, the RAMSAR framework will be set up on 1.83 km2: 0.00	
					• By 2035, plantations in open areas will be realized on 0.10 km2.: 0.00	
					• By 2035, restoration/reclamation of degraded areas will be realized on 0.50 km2: 1.52	

General comments

There are other LDN Targets which are implemented by other agencies (Forests and Livestock) which are not included in this reporting. These areas will be included in the LDN Decision Support System of Bhutan: https://wocatapps.users.earthengine.app/view/dss-bhutan SO1-V.IA-T1 It was not possible to upload the shapefile with Implemented actions. The geolocation of reported Implemented actions (shapefile) can be accessed here: https://drive.google.com/file/d/11FCiDTINtzIsSaiHAwFROI4QsjhDV5iM/view?usp=share_link For more information visit: https://www.wocat.net/library/media/274/ Information sources: For reforestation, the information was taken from the annual reports of Green Bhutan Corporation Limited (GBCL) available at www.gbcl.bt For pasture improvement, the information was received from the Department of Livestock, Ministry of Agriculture and Livestock. For mining restoration, the information was received from the Department of Geology and Mines (DGM), Ministry of Energy and Natural Resources.

SO2-1 Trends in population living below the relative poverty line and/or income inequality in affected areas

Relevant metric

Choose the metric that is relevant to your country:

- ○ Proportion of population below the international poverty line
- ◉ Income inequality (Gini Index)

Income inequality (Gini Index)

SO2-1.T2: National estimates of income inequality (Gini index)

Year	Income inequality (Gini Index)
2000	
2001	
2002	
2003	0 .416
2004	
2005	
2006	
2007	0 .35
2008	
2009	
2010	
2011	
2012	0 .36
2013	
2014	
2015	
2016	
2017	0 .38
2018	
2019	
2020	

Qualitative assessment

SO2-1.T3: Interpretation of the indicator

Indicator metric	Change in the indicator	Comments
Income inequality (Gini Index)	No change	The Gini Index, which measures inequality, has remained almost the same at the national level (0.36 in 2012 and 0.38 in 2017). However, there is slight improvement in Gini Index in 2022, which stands at 0.285

General comments

The source of above data is the National Statistical Bureau (NSB) of Bhutan. Website: www.nsb.gov.bt

SO2-2 Trends in access to safe drinking water in affected areas

Proportion of population using safely managed drinking water services

SO2-2.T1: National estimates of the proportion of population using safely managed drinking water services

Year	Urban (%)	Rural (%)	Total (%)
2000			47.6
2001			42.2
2002			42.2
2003			42.2
2004			67.4
2005			67.4
2006			81.4
2007			82.3
2008			83.2
2009			85.9
2010			83.9
2011			86.8
2012	87.0	73.3	78.0
2013	87.0	73.3	78.0
2014	87.0	73.3	78.0
2015	87.0	73.3	95.9
2016	96.8	95.5	95.9
2017	96.8	95.5	95.9
2018	96.8	95.5	95.9
2019	96.8	95.5	95.9
2020	96.8	95.5	95.9

Qualitative assessment

SO2-2.T2: Interpretation of the indicator

Change in the indicator	Comments
Increase	This increase is mainly due to government's priority given to safe drinking water

General comments

The data reported in Table SO2-2.T1 above is for households having access to safe drinking water and information prior to 2012 there is no segregation between Urban and Rural. Sources: For year 2000-2011 is Statistical Year Book, for year 2012-2015 is Bhutan Living Standard Survey 2012 and for year 2016-2020 is Bhutan Living Standard Survey 2017, all available at: www.nsb.gov.bt

SO2-3 Trends in the proportion of population exposed to land degradation disaggregated by sex

Proportion of the population exposed to land degradation disaggregated by sex

SO2-3.T1: National estimates of the proportion of population exposed to land degradation disaggregated by sex.

Time period	Population exposed (count)	Percentage of total population exposed (%)	Female population exposed (count)	Percentage of total female population exposed (%)	Male population exposed (count)	Percentage of total male population exposed (%)
Baseline period	24421	3 .6	11126	3 .5	13295	3 .7
Reporting period	72542	9 .8	33352	9 .7	39190	10 .0

Qualitative assessment

SO2-3.T2: Interpretation of the indicator

Change in the indicator	Comments
Increase	There is increase in national estimates of the proportion of population exposed to land degradation as there is an increase in total area of degraded land in the reporting period by 619.83 sq km. In other words, there is an increase in proportion of degraded land relative to the total land area from 11.9% to 13.5%.

General comments

Bhutan don't have land degradation assessment carried out at the national level. So it is difficult to estimate the proportion of population exposed to land degradation. Hence, Bhutan accepts the default data.

SO2 Voluntary Targets

SO2-VT.T1

Target	Year	Level of application	Status of target achievement	Comments
Provide households with access to 24×7 drinking water and irrigation	2023	National	Ongoing	This target is to be achieved through the implementation of Water Flagship Program, which is one of the nine flagship programs initiated in the 12th FYP (2018-2023) by the present government to address high priority national issues (that includes drinking and irrigation water).

General comments

Sources: Prime Minister's Office at www.pmo.gov.bt https://kuenselonline.com/water-flagship-programme-from-2021/ National Service water project at www.desuung.org.bt

SO3-1 Trends in the proportion of land under drought over the total land area

Drought hazard indicator

SO3-1.T1: National estimates of the land area in each drought intensity class as defined by the Standardized Precipitation Index (SPI) or other nationally relevant drought indices

	Drought intensity classes				
	Mild drought (km²)	Moderate drought (km²)	Severe drought (km²)	Extreme drought (km²)	Non-drought (km²)
2000	16 680	9 228	3 291	3 177	6 312
2001	10 568	7 776	3 929	2 049	14 367
2002	16 642	6 282	1 174	0	14 590
2003	16 367	6 821	684	0	14 817
2004	11 382	7 052	1 634	0	18 620
2005	15 190	7 945	2 339	4 827	8 388
2006	17 792	3 690	6 510	7 541	3 154
2007	16 613	5 034	2 053	685	14 303
2008	26 989	1 375	483	2 468	7 373
2009	17 045	5 715	1 171	0	14 758
2010	4 452	0	0	0	34 236
2011	9 185	7 350	4 606	4 115	13 432
2012	16 003	0	0	0	22 685
2013	9 246	8 814	6 382	637	13 609
2014	19 302	1 757	1 211	7 139	9 280
2015	34 184	4 504	0	0	0
2016	17 755	10 272	2 743	685	7 232
2017	16 917	6 910	6 109	7 227	1 526
2018	11 420	10 401	4 994	10 280	1 593
2019	18 772	8 631	2 751	1 750	6 783
2020					
2021					

SO3-1.T2: Summary table for land area under drought without class break down

	Total area under drought (km²)	Proportion of land under drought (%)
2000	32 376	83 .6
2001	24 321	62 .8
2002	24 098	62 .2
2003	23 872	61 .6
2004	20 068	51 .8
2005	30 301	78 .2

	Total area under drought (km²)	Proportion of land under drought (%)
2006	35 534	91 .7
2007	24 385	62 .9
2008	31 315	80 .8
2009	23 930	61 .8
2010	4 452	11 .5
2011	25 256	65 .2
2012	16 003	41 .3
2013	25 079	64 .7
2014	29 408	75 .9
2015	38 688	99 .8
2016	31 456	81 .2
2017	37 162	95 .9
2018	37 095	95 .7
2019	31 905	82 .3
2020		-
2021		-

Qualitative assessment:

The total area under drought looks quite high, but in the absence of national data on drought trends, it is difficult to confirm and validate. The general view and observation on drought in Bhutan is: Two primary types of drought may affect Bhutan: meteorological (usually associated with a precipitation deficit) and hydrological (usually associated with a deficit in surface and subsurface water flow, potentially originating in the region's wider river basins). Agricultural drought may also occur when water availability constraints interact with crop choices and land management practices. Bhutan is projected to experience an overall increase in rainfall. As defined by the standardized precipitation evaporation index (SPEI), −2 indicates severe drought, however Bhutan shows a near 0.5 index, indicating an increase in precipitation through the end of the century. This is projected to increase to 4%–10% by the 2090s depending on RCP emissions pathway (Source: Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank) Please refer General Comments below.

General comments

Below is the comments on drought in Bhutan from National Centre for Hydrology and Meteorology (NCHM): Rainfall is projected to increase in the future, globally as well as in Bhutan due to climate change. Bhutan only has observed data since 1996 and the historical trend during these short periods show a decreasing rainfall trend for Bhutan. However it is difficult to conclude that the decreasing trend of rainfall will continue in the coming years. The trend is expected to be spatially and temporally heterogeneous. The pattern is made more complex by the country's orographic structure. Due to this, isolated places of the country have experienced and are likely to experience dry episodes causing agricultural droughts in a few pockets of the country. Also, there are reports and stories in news and media on the drying of streams in few places of the country. It is therefore likely that a few places may have experienced agricultural drought. However, these dry conditions are usually caused by the variability in the summer monsoon. So far, no in depth study on droughts have been conducted by the National Centre for Hydrology and Meteorology (NCHM). The drying of streams and related studies were done by other government agencies like the Watershed Management Division of Department of Forests and Park Services , Ministry of Energy and Natural Resources. Under the GCF project and with the support from the ICIMOD, NCHM has piloted a drought watch platform based on satellite data for providing information and services on drought and indices that are relevant to the users from the agriculture sector. The platform is a tool to monitor the presence or absence of drought. Website: www.nchm.gov.bt

SO3-2 Trends in the proportion of the population exposed to drought

Drought exposure indicator

Exposure is defined in terms of the number of people who are exposed to drought as calculated from the SO3-1 indicator data.

SO3-2.T1: National estimates of the percentage of the total population within each drought intensity class as well as the total population count and the proportion of the national population exposed to drought regardless of intensity.

	Non-exposed		Mild drought		Moderate drought		Severe drought		Extreme drought		Exposed population	
Reporting year	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%
2000	136083	27.7	191005	38.9	139913	28.5	20235	4.1	4016	0.8	355 169	72.3
2001	292431	58.2	129485	25.8	45666	9.1	28688	5.7	5933	1.2	209 772	41.8
2002	211628	41.0	268066	52.0	11629	2.3	24262	4.7	0	0.0	303 957	59.0
2003	299412	56.9	195647	37.2	26736	5.1	4476	0.9	0	0.0	226 859	43.1
2004	300288	55.6	49245	9.1	190074	35.2	110	0.0	0	0.0	239 429	44.4
2005	165689	30.0	124779	22.6	128079	23.2	114329	20.7	19278	3.5	386 465	70.0
2006	130733	23.3	102223	18.2	37946	6.8	109667	19.5	181484	32.3	431 320	76.7
2007	208411	36.1	189866	32.9	46174	8.0	95169	16.5	36908	6.4	368 117	63.9
2008	67918	11.6	391820	66.7	11704	2.0	24639	4.2	91530	15.6	519 693	88.4
2009	96629	16.1	360087	59.9	124056	20.6	20739	3.4	0	0.0	504 882	83.9
2010	523949	85.6	87860	14.4	0	0.0	0	0.0	0	0.0	87 860	14.4
2011	123784	19.8	244997	39.2	124362	19.9	68527	11.0	63388	10.1	501 274	80.2
2012	419822	65.8	217855	34.2	0	0.0	0	0.0	0	0.0	217 855	34.2
2013	123643	19.0	288481	44.4	150067	23.1	72542	11.2	14833	2.3	525 923	81.0
2014	26267	4.0	465449	70.1	17625	2.7	21236	3.2	133271	20.1	637 581	96.0
2015	0	0.0	582481	86.0	95197	14.0	0	0.0	0	0.0	677 678	100.0
2016	24074	3.5	471505	68.1	159245	23.0	36117	5.2	1684	0.2	668 551	96.5
2017	0	0.0	249943	35.4	103247	14.6	173136	24.5	179750	25.5	706 076	100.0
2018	0	0.0	148808	20.6	228367	31.7	47387	6.6	296803	41.1	721 365	100.0
2019	99238	13.5	328145	44.6	102809	14.0	35875	4.9	170072	23.1	636 901	86.5
2020		-		-		-		-		-	-	-
2021		-		-		-		-		-	-	-

SO3-2.T2: National estimates of the percentage of the female population within each drought intensity class.

	Non-exposed		Mild drought		Moderate drought		Severe drought		Extreme drought		Exposed female population	
Reporting year	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%
2000	62321	26.8	92668	39.8	65921	28.3	9761	4.2	1928	0.8	170 278	73.2

	Non-exposed		Mild drought		Moderate drought		Severe drought		Extreme drought		Exposed female population	
Reporting year	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%
2001	135515	57.0	63302	26.6	22060	9.3	14077	5.9	2670	1.1	102 109	43.0
2002	99001	40.6	127533	52.3	5658	2.3	11677	4.8	0	0.0	144 868	59.4
2003	138127	55.6	95055	38.3	13181	5.3	1954	0.8	0	0.0	110 190	44.4
2004	141333	55.5	24093	9.5	89078	35.0	47	0.0	0	0.0	113 218	44.5
2005	81020	31.1	59787	23.0	57236	22.0	52891	20.3	9389	3.6	179 303	68.9
2006	60092	22.7	49286	18.7	18433	7.0	52638	19.9	83772	31.7	204 129	77.3
2007	101389	37.4	88206	32.5	20831	7.7	43481	16.0	17201	6.3	169 719	62.6
2008	31971	11.6	186962	67.7	5702	2.1	11784	4.3	39635	14.4	244 083	88.4
2009	46336	16.4	166112	58.8	60061	21.3	9918	3.5	0	0.0	236 091	83.6
2010	246114	85.7	41213	14.3	0	0.0	0	0.0	0	0.0	41 213	14.3
2011	58393	19.9	110236	37.6	60057	20.5	33268	11.3	31317	10.7	234 878	80.1
2012	196969	65.9	102079	34.1	0	0.0	0	0.0	0	0.0	102 079	34.1
2013	58731	19.3	130398	42.8	73742	24.2	34362	11.3	7243	2.4	245 745	80.7
2014	12742	4.1	213814	68.8	8586	2.8	10215	3.3	65525	21.1	298 140	95.9
2015	0	0.0	270476	85.3	46767	14.7	0	0.0	0	0.0	317 243	100.0
2016	11701	3.6	216872	66.9	77351	23.9	17732	5.5	538	0.2	312 493	96.4
2017	0	0.0	114543	34.7	49311	14.9	79081	23.9	87514	26.5	330 449	100.0
2018	0	0.0	67020	19.8	109145	32.3	22817	6.8	138691	41.1	337 673	100.0
2019	48806	14.1	153977	44.6	47824	13.9	17115	5.0	77224	22.4	296 140	85.9
2020		-		-		-		-		-	-	-
2021		-		-		-		-		-	-	-

SO3-2.T3: National estimates of the percentage of the male population within each drought intensity class.

	Non-exposed		Mild drought		Moderate drought		Severe drought		Extreme drought		Exposed male population	
Reporting year	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%
2000	73762	28.5	98337	38.0	73992	28.6	10474	4.0	2088	0.8	184 891	71.5
2001	156916	59.3	66183	25.0	23606	8.9	14611	5.5	3263	1.2	107 663	40.7
2002	112627	41.5	140533	51.7	5971	2.2	12585	4.6	0	0.0	159 089	58.5
2003	161285	58.0	100592	36.2	13555	4.9	2522	0.9	0	0.0	116 669	42.0
2004	158955	55.7	25152	8.8	100996	35.4	63	0.0	0	0.0	126 211	44.3
2005	84669	29.0	64992	22.3	70843	24.3	61438	21.1	9889	3.4	207 162	71.0

	Non-exposed		Mild drought		Moderate drought		Severe drought		Extreme drought		Exposed male population	
Reporting year	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%	Population count	%
2006	70641	23.7	52937	17.8	19513	6.6	57029	19.1	97712	32.8	227 191	76.3
2007	107022	35.0	101660	33.3	25343	8.3	51688	16.9	19707	6.5	198 398	65.0
2008	35947	11.5	204858	65.8	6002	1.9	12855	4.1	51895	16.7	275 610	88.5
2009	50293	15.8	193975	60.8	63995	20.1	10821	3.4	0	0.0	268 791	84.2
2010	277835	85.6	46647	14.4	0	0.0	0	0.0	0	0.0	46 647	14.4
2011	65391	19.7	134761	40.6	64305	19.4	35259	10.6	32071	9.7	266 396	80.3
2012	222853	65.8	115776	34.2	0	0.0	0	0.0	0	0.0	115 776	34.2
2013	64912	18.8	158083	45.8	76325	22.1	38180	11.1	7590	2.2	280 178	81.2
2014	13525	3.8	251635	71.3	9039	2.6	11021	3.1	67746	19.2	339 441	96.2
2015	0	0.0	312005	86.6	48430	13.4	0	0.0	0	0.0	360 435	100.0
2016	12373	3.4	254633	69.1	81894	22.2	18385	5.0	1146	0.3	356 058	96.6
2017	0	0.0	135400	36.0	53936	14.4	94055	25.0	92236	24.6	375 627	100.0
2018	0	0.0	81788	21.3	119222	31.1	24570	6.4	158112	41.2	383 692	100.0
2019	50432	12.9	174168	44.5	54985	14.1	18760	4.8	92848	23.7	340 761	87.1
2020		-		-		-		-		-	-	-
2021		-		-		-		-		-	-	-

Qualitative assessment

Interpretation of the indicator

For Bhutan, the proportion of the population exposed to drought should be low as no severe or extreme drought incidences were reported in the past. That said, however, sporadic mild to moderate drought incidences were reported in the media in the past, which are mainly caused by delayed monsoon rainfall coupled with the drying up of water sources like small streams, springs and lakes.

General comments

General comments on Drought in Bhutan from National Centre for Hydrology and Meteorology (NCHM): Rainfall is projected to increase in the future, globally as well as in Bhutan due to climate change. Bhutan only has observed rainfall data since 1996 and the historical trend during these short periods show a decreasing rainfall trend for Bhutan. However it is difficult to conclude that the decreasing trend of rainfall will continue in the coming years. The trend is expected to be spatially and temporally heterogeneous. The pattern is made more complex by the country's orographic structure. Due to this, isolated places of the country have experienced and are likely to experience dry episodes causing agricultural droughts in a few pockets of the country. Also, there are reports and stories in news and media on the drying of streams in few places of the country. It is therefore likely that a few places may have experienced agricultural drought. However, these dry conditions are usually caused by the variability in the summer monsoon. So far, no in depth study on droughts have been conducted by the National Centre for Hydrology and Meteorology. The drying of streams and related studies were done by other offices like the Watershed Management Division of the Department of Forests and Park Services under the Ministry of Energy and Natural Resources. Under the GCF project and with the support from the ICIMOD, NCHM has piloted a drought watch platform based on satellite data for providing information and services on drought and indices that are relevant to the users from the agriculture sector. The platform is a tool to monitor the presence or absence of drought. Website: www.nchm.gov.bt Also refer for more on drought in Bhutan: https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15874-WB_Bhutan%20Country%20Profile-WEB.pdf

SO3-3 Trends in the degree of drought vulnerability

Drought Vulnerability Index

SO3-3.T1: National estimates of the Drought Vulnerability Index

Year	Total country-level DVI value (tier 1)	Male DVI value (tiers 2 and 3 only)	Female DVI value (tiers 2 and 3 only)
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017			
2018	0 .58		
2019			
2020			
2021			

Method

Which tier level did you use to compute the DVI?

☐ Tier 1 Vulnerability Assessment ⓘ
☐ Tier 2 Vulnerability Assessment ⓘ
☐ Tier 3 Vulnerability Assessment ⓘ

Qualitative assessment

SO3-3.T2: Interpretation of the indicator

	Change in the indicator	Comments

General comments

No national data is available for this reporting.

SO-3: To mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems.

SO3 Voluntary Targets

SO3-VT.T1

Target	Year	Level of application	Status of target achievement	Comments
Provide households with access to 24×7 drinking water and irrigation	2023	National	Ongoing	This target is to be achieved through the implementation of Water Flagship Program, which is one of the nine flagship programs initiated in the 12th FYP (2018-2023) by the present government to address high priority national issues (that includes drinking and irrigation water).

General comments

Sources: Prime Minister's Office at www.pmo.gov.bt https://kuenselonline.com/water-flagship-programme-from-2021/ National Service water project at www.desuung.org.bt

SO4-1 Trends in carbon stocks above and below ground

Soil organic carbon stocks

Trends in carbon stock above and below ground is a multi-purpose indicator used to measure progress towards both strategic objectives 1 and 4. Quantitative data and a qualitative assessment of trends in this indicator are reported under strategic objective 1, progress indicator SO1-3.

SO4-2 Trends in abundance and distribution of selected species

SO4-2.T1: National estimates of the Red List Index of species survival

Year	Red List Index	Lower Bound	Upper Bound	Comment
2000	0 .800	0 .750	0 .849	
2001	0 .800	0 .750	0 .849	
2002	0 .800	0 .750	0 .849	
2003	0 .800	0 .750	0 .849	
2004	0 .800	0 .750	0 .849	
2005	0 .800	0 .750	0 .849	
2006	0 .800	0 .750	0 .849	
2007	0 .800	0 .750	0 .849	
2008	0 .800	0 .750	0 .849	
2009	0 .800	0 .750	0 .849	
2010	0 .800	0 .750	0 .849	
2011	0 .800	0 .750	0 .849	
2012	0 .800	0 .750	0 .849	
2013	0 .800	0 .750	0 .849	
2014	0 .800	0 .750	0 .849	
2015	0 .800	0 .750	0 .849	
2016	0 .800	0 .750	0 .849	
2017	0 .800	0 .750	0 .849	
2018	0 .800	0 .750	0 .849	
2019	0 .800	0 .750	0 .849	
2020	0 .800	0 .750	0 .849	

Qualitative assessment

SO4-2.T2: Interpretation of the indicator

Change in the indicator	Drivers: Direct (Choose one or more items)	Drivers: Indirect (Choose one or more items)	Which levers are being used to reverse negative trends and enable transformative change?	Responses that led to positive RLI trends	Comments

SO-4: To generate global environmental benefits through effective implementation of the United Nations Convention to Combat Desertification.

Change in the indicator	Drivers: Direct (Choose one or more items)	Drivers: Indirect (Choose one or more items)	Which levers are being used to reverse negative trends and enable transformative change?	Responses that led to positive RLI trends	Comments
Negative	1. Land-use change 2. Overexploitation 3. Invasive alien species	1. Production and Consumption Patterns 2. Human Population Dynamics and Trends 3. Trade	1. Incentives and Capacity-Building 2. Environmental Law and Implementation 3. Cross-Sectoral Cooperation		Other direct drivers: Developmental activities, Increase in fire intensity/ frequency, Shifting Agriculture, Logging and wood harvesting, and hunting and trap terrestrial animal Other indirect drivers: Climate Change (Habitat shifting and alteration, Natural disasters Other levers used: Creation of Protected Area System, Designation of Ramsar Sites, Access to education (more awareness on Biodiversity importance), Sustaible utilisation of Natural resources
Positive				1. Education & Training 2. Law Enforcement & Prosecution 3. Conservation Designation & Planning 4. Awareness Raising 5. Livelihood, Economic & Moral Incentives 6. Species Management 7. Research & Monitoring 8. Legal & Policy Frameworks	Other responses: Enabling Policies (Constitutional mandate to maintain 60% of the Country under forest cover), Creation of Protected Area System (51.44%), Religious believes, Sustainable utilisation of Natural resources

General comments

Information source: Data and information received from the National Biodiversity Centre (NBC). Website: www.nbc.gov.bt

SO4-3 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type

SO4-3.T1: National estimates of the average proportion of Terrestrial KBAs covered by protected areas (%)

Year	Protected Areas Coverage(%)	Lower Bound	Upper Bound	Comments
2000	27.98	27 .98	27 .98	
2001	27.98	27 .98	27 .98	
2002	27.98	27 .98	27 .98	
2003	29.9	29 .91	29 .91	
2004	30.03	30 .03	30 .03	
2005	30.03	30 .03	30 .03	
2006	30.03	30 .03	30 .03	
2007	30.03	30 .03	30 .03	
2008	51.44	51 .44	51 .44	
2009	51.44	51 .44	51 .44	
2010	51.44	51 .44	51 .44	
2011	51.44	51 .44	51 .44	
2012	51.44	51 .44	51 .44	
2013	51.44	51 .44	51 .44	
2014	51.44	51 .44	51 .44	
2015	51.44	51 .44	51 .44	
2016	51.44	51 .44	51 .44	
2017	51.44	51 .44	51 .44	
2018	51.44	51 .44	51 .44	
2019	51.44	51 .4	51 .44	
2020	51.44	51 .44	51 .44	

Qualitative assessment

SO4-3.T2: Interpretation of the indicator

Qualitative Assessment	Comment
Increasing	This is possible due to farsighted ruler coupled with strong conservation ethics and law. The National Forest Policy, which is now enshrined in the Constitution of the Kingdom of Bhutan 2008, requires the maintenance of minimum 60% of the total country area under forest cover for all times to come.

General comments

Source of information: Department of Forests and Park Services (DoFPS) under the Ministry of Energy and Natural Resources. Website: www.dofps.gov.bt

SO4 Voluntary Targets

SO4-VT.T1

Target	Year	Level of application	Status of target achievement	Comments
Maintain 436 million tonnes of forest carbon stock outside protected area system	2030	National	Ongoing	Second Nationally Determined Contribution of the Kingdom of Bhutan
Conduct wetland assessment for understanding organic carbon content	2030	National	Ongoing	Second Nationally Determined Contribution of the Kingdom of Bhutan

Complementary information

Source: Second Nationally Determined Contribution of the Kingdom of Bhutan 2021 Available at: https://unfccc.int/sites/default/files/resource/TNC%20of%20Bhutan%202020.pdf

SO5-1 Bilateral and multilateral public resources

Tier 1: Please provide information on the international public resources provided and received for the implementation of the Convention, including information on trends.

Trends in international bilateral and multilateral public resources provided

- ○ Up ↑
- ◉ Stable ←→
- ○ Down ↓
- ○ Unknown ∾

Trends in international bilateral and multilateral public resources received

- ○ Up ↑
- ◉ Stable ←→
- ○ Down ↓
- ○ Unknown ∾

Bhutan's development processes are based on the overarching development philosophy of "Gross National Happiness (GNH)". The GNH philosophy recognizes environmental sustainability as one of the four pillars of development. It advocates a multi-dimensional development approach that seeks to maintain harmony and balance between economic growth, environmental sustainability, cultural preservation and good governance. Further, in keeping with the country's longstanding commitment to ensure environmentally sustainable development and recognition of the environmental conservation as one of the cornerstones of GNH, the Constitution of the Kingdom of Bhutan 2008, explicitly features environmental conservation as a constitutional mandate, particularly the need to maintain a minimum of 60% of Bhutan's total land under forest cover for all time to conserve the country's natural resources and to prevent degradation of the ecosystem functions. Within these broad policy and legal frameworks, Bhutan has developed many policies and laws to preserve our vast, diverse natural resources. They outline procedures for ensuring the sustainable management of our forests, waterways, wildlife, and plants, while economic activity—from mining to infrastructure development to industry—is undertaken in such a manner that environmental impacts are minimal and properly managed. The existing policies and legislations contain components or provisions that would, through proper adoption and effective implementation by the stakeholders, contrinute towards addressing the land degradation in the country. PRAIS 4 reporting of the Royal Government of Bhutan coincides with its two Five Year Plans (FYPs) – 11th FYP (2013-2018) and 12th FYP (2018-2023). Both the Plans have integrated carbon neutral development as part of the national key result areas to guide planning and implementation of development activities within all sectors. Bhutan is also committed to achieving the land degradation neutrality by 2030 through sustainable land management practices. However, the implementation of Bhutan's five-year plan relies on external aid, including bilateral and multilateral assistance, to sustain the country's rising capital expenditure. For example, ODA constituted more than 55 per cent of the 11 FYP total capital expenditure and 54 per cent of the 12 FYP total capital expenditure. The trend of inflow of ODA over the reporting period is as presented below: Year Total Amount (in million BTN) 2015 9,955.02 2016 14,889.60 2017 12,986.75 2018 14,847.07 2019 10,516.48 Source: Annual Environmental Accounts, 2020 However, for the implementation of the Convention, the resources generally come from project tied grants (other than the Government of India) and the details are as given below: Financial year Total Amount (in million BTN) 2015-16 3,102.897 2016-17 3,104.190 2017-18 3,646.239 2018-19 3,892.196 2019-20 4,981.795 Source: Annual Financial Statements, Ministry of Finance Notwithstanding the above, the major funding sources for the implementation of the Convention are GEF and GCF. The details of GEF, GCF and other donor supported projects are presented in a separate sheet under the "Other Files for Reporting". The external resources mobilization is generally done through Round Table Meeting (RTM), which was initiated in the early 1980s as an important forum for policy dialogue and aid coordination. Typically held twice over the course of a Five Year Plan (FYP) period, such meeting allows Bhutan and development partners to discuss common interests and issues, and to strengthen cooperation. The RTM also provides opportunity to take stock of development progress to date, review challenges, and work on strategies with development partners to ensure the full alignment of development assistance for the achievement of national priorities and Global Goals.

The then Gross National Happiness Commission (GNHC) now merged with the Ministry of Finance has been coordinating preparation of policy and five-year plan, programming and prioritization of national priorities. Besides, the GNHC was also mandated to coordinate and facilitate mobilization of all external grants and ensure that grants are allocated to agencies and Local Governments based on government priority and guidelines in consultation with Ministry of Finance. Furthermore, where possible, GNHC would support the integration of climate change, biodiversity and land degradation into policies, programs and plans and mobilize external resources for the implementation of programs and projects. The same mandate will be continued even after merging with the Ministry of Finance. The Ministry of Finance (MoF), on other hand, has been mandated to formulate and implement dynamic fiscal policies and sound financial management through maximization of resource generation, efficient allocation, prudent expenditure and debt management and proper accountability of public resources. The mandates and functions of the MOF is governed by the Public Finance Act, Public Debt Policy, Income Tax Act, Revised Taxes and Levies Act, Fiscal Incentives 2017 and PPP Policy. In line with provisions of the various legislations, MOF has mandate for resource mobilization and budget allocation and also providing fiscal incentives and other instruments to support private sector lending to support implementation of the policy. Further to above, the Royal Audit Authority (RAA), as per Audit Act of Bhutan 2006 and 2018, Public Finance Act of Bhutan 2007 & Public Finance (Amendment) Act 2012 and and Financial Rules & Regulations 2001 & 2016, undertakes audit of the Annual Financial Statement prepared by the Ministry of Finance. However, the mandate of implementing projects and programs lies with the respective agencies. For projects related to SLM, climate change, biodiversity, and water, the mandate lies with the Ministry of Agriculture and Livestock, although the actual implementation takes place in collaboration with other stakeholders such as Ministry of Energy and Natural Resources, local governments, CSO and NGOs.

Tier 2: Table 1 Financial resources provided and received

		Total Amount USD	
Provided / Received	Year	Committed	Disbursed / Received

		Total Amount USD	
Provided / Received	Year	Committed	Disbursed / Received
Provided	2016	Committed 0	Disbursed 0
Provided	2017	Committed 0	Disbursed 0
Provided	2018	Committed 0	Disbursed 0
Provided	2019	Committed 0	Disbursed 0
Received	2016	Committed 442 973 .01	Received 452 915 .51
Received	2017	Committed 717 660 .00	Received 217 660 .00
Received	2018	Committed 51 055 .30	Received 51 055 .30
Received	2019	Committed 17 175 .60	Received 17 175 .60
Total resources provided:		0	0
Total resources received:		1 228 863 .91	738 806 .41

Documentation box

	Explanation
Year	
Recipient / Provider	
Title of project, programme, activity or other	
Total Amount USD	
Sector	
Capacity Building	
Technology Transfer	
Gender Equality	
Channel	
Type of flow	
Financial Instrument	
Type of support	
Amount mobilised through public interventions	
Additional Information	

General comments

Bhutan has chosen and completed only Tier 1 as it is difficult to get segregated financial resources provided and received from different sources, particularly targeting the implementation of the Convention. For details of information reported in Tier 1, please refer the following documents: 1. Updated list of existing Policies and Legislations, uploaded under "Other Files for Reporting" 2. Resource Mobilization for Sustainable LDC Graduation of Bhutan, a Development Paper submitted to Economic and Social Commission for Asia and the Pacific (ESCAP) by Mr. Tandin Wangchuk, February 2022, available at <https://repository.unescap.org/handle/20.500.12870/4430> 3. List of GEF and GCF Projects in Bhutan, uploaded under "Other Files for Reporting" 4. Project Profile of the Ministry of Agriculture and Livestock, uploaded under "Other Files for Reporting" 5. Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank, available at <https://www.adb.org/publications/climate-risk-country-profile-bhutan> 6. Annual Financial Statements (AFS) of the Ministry of Finance, Royal Government of Bhutan, available at <https://www.mof.gov.bt/publications/reports/annual-financial-statements/>

SO5-2 Domestic public resources

Tier 1: Please provide information on the domestic public expenditures, including subsidies, and revenues, including taxes, directly and indirectly related to the implementation of the Convention, including information on trends.

Trends in domestic public expenditures and national level financing for activities relevant to the implementation of the Convention

- (●) Up ↑
- ( ) Stable ←→
- ( ) Down ↓
- ( ) Unknown ∾

Trends in domestic public revenues from activities related to the implementation of the Convention

- (●) Up ↑
- ( ) Stable ←→
- ( ) Down ↓
- ( ) Unknown ∾

Domestic resource mobilization has been a major priority of the government, particularly for the 11th FYP (2013-2018). While domestic resource mobilization has improved, it falls short of Bhutan's developmental needs and Bhutan thus remains reliant on grant aid in the short to medium term. In terms of financing its development plans, Bhutan's domestic resource contribution to funding its five-year Plans grew from 61 percent of total outlay in the 10th plan (2008-2013) to 65 percent in the 11th Plan. Domestic resources are projected to cover 70 percent of the total outlay of BTN 310.016 billion in the 12th Plan (2018-2023). The year wise domestic resource mobilization during the reporting period is as given below: Financial Year Domestic Revenue (in million BTN) 2015-16 28,033.812 2016-17 29,713.600 2017-18 36,871.720 2018-19 34,707.670 2019-20 36,218.876 Source: Annual Financial Statements, Ministry of Finance The main economic instrument implemented include Economic Development Policy 2010 and 2016, has a vision to promote a green and self-reliant economy sustained by an IT enabled knowledge society guided by the philosophy of GNH. Some of the strategies mentioned under the policy are to: diversify the economic base with minimal ecological footprint; harness and add value to natural resources in a sustainable manner; reduce dependency on fossil fuel – transportation; economic development process shall take into account environmental mainstreaming in a phased manner; provide incentives for the promotion of green technology – micro-hydro, solar, wind, etc; protection of biodiversity, genetic resources and promotion of indigenous knowledge. The policy has recognized mineral resources as finite and non-renewal natural resources – use in a sustainable manner ensuring environmental considerations. It promotes organic farming and encourages phasing out of use of harmful chemical fertilizers and pesticides. The policy also recommends provision of incentives in the waste management services. It mentions that for recycling plants processing domestic wastes shall be exempted from Custom duty and sales tax on plant and machinery and also exempted from CIT/BIT for 15 years and will also be provided with land on nominal lease. Similarly, for all waste management plant/activities for domestic wastes shall be exempted from Custom duty and sale tax on plant. Other economic instrument implemented is the Foreign Direct Investment (FDI) Policy 2010 and 2019, which encourages development of green and sustianable economy,. promotion of socially responsible and ecologicaly sound industries, promotion of culturally and spioritually sensitive industries, investment in services that promote Brand Bhutan and creation of a knowledge society. Fiscal incentive measure is another instrument implemented wherein temporary exemption of taxes and duties or granting income tax holidays for boosting private sector development and attracting foreign direct investment to achieve broader economic development base. For a developing economy, with limited domestic productive capacity, fiscal incentives wil continue to play a pivotal role in strengthening economy by boosting private sector growth and attracting FDI.

The Department of Revenue and Customs (DRC) of the Ministry of Finance is mandated to collect, review and submit annual National Revenue Report to the Government, highlighting the domestic revenue performance for the year. The DRC ensures that the tax and customs administration collects taxes efficiently and effectively at minimum cost through impartial and consistent enforcement of regulations, and to provide a convenient and honest services to the tax payers.

Tier 2: Table 2 Domestic public resources

	Year	Amounts	Additional Information
Government expenditures			
Directly related to combat DLDD			
Indirectly related to combat DLDD			
Subsidies			
Subsidies related to combat DLDD			
Total expenditures / total per year			

	Year	Amounts	Additional Information
Total revenues / total per year			

	Year	Amounts	Additional Information
Government revenues			
Environmental taxes for the conservation of land resources and taxes related to combat DLDD			
Total revenues / total per year			

Documentation box

	Explanation
Government expenditures	
Subsidies	
Government revenues	
Domestic resources directly or indirectly related to combat DLDD	

Has your country set a target for increasing and mobilizing domestic resources for the implementation of the Convention?

- ○ Yes
- ○ No

General comments

Bhutan has chosen and completed Tier 1 only as it is difficult to get details of domestic resources invested in the implementation of the Convention directly or indirectly. For more information on Domestic Revenue, please visit: www.mof.gov.bt/publications/reports/revenue-report/

SO5-3 International and domestic private resources

Tier 1: Please provide information on the international and domestic private resources mobilized by the private sector of your country for the implementation of the Convention, including information on trends.

Trends in international private resources

- ○ Up ↑
- ○ Stable ←→
- ○ Down ↓
- ◉ Unknown ∾

Trends in domestic private resources

- ○ Up ↑
- ○ Stable ←→
- ○ Down ↓
- ◉ Unknown ∾

Bhutan has given priority to leveraging green finance. To date, these include the Bhutan Trust Fund for Environmental Conservation (BTFEC), the Bhutan for Life programme, the Biodiversity Finance Initiative (BIOFIN) project, the Reducing Emission from Deforestation and + Readiness Project, the Climate Investment Fund, the Global Environment Facility (GEF), and the Green Climate Fund (GCF). Bhutan has declared to remain carbon neutral through its Nationally Determined Contribution to the Paris Agreement in 2015. This implies that its carbon emissions, estimated at 2.2 million tons of CO2, will not exceed total carbon sequestration by its forests. Furthermore, the Constitution of Bhutan mandates that the country maintain a minimum of 60 percent of the total land under forest cover. On international private resources, foreign direct investment and remittances were the two most important sources. However, Bhutan has had limited success in terms of attracting FDI. Annual inflow of FDI has been less than 1 percent of GDP for the past decade. As of 2020, Bhutan recorded a total of 92 FDI projects—most of which are from Asian countries with India remaining the major source of investment (47 percent), followed by Singapore (19 percent) and Thailand (11 percent). The COVID-19 have had negative impact on FDI as there were no enquiry from the investors for foreign investment and the government could not carry out promotion activity in the year 2020. Nevertheless, Government has adopted various policy measures to attract FDI. The FDI Policy and FDI Rules and Regulations were revised in 2019 to realign the FDI regime with the changing needs of the Bhutanese economy, as well as to ensure that FDI contributes to driving growth and development. Remittances are becoming an increasingly important source of non-debt financing in Bhutan as is in many other countries. According to Annual Royal Monetary Authority Report 2020, total official remittances increased from $33.44 million in 2019 to $ 70.67 million in 2020.

Tax revenue as percentage of GDP averaged around 14 percent during the last decade, which is higher than most LDCs where tax revenue still amounts to less than 10 percent of GDP. However, private sector in Bhutan remains small and growth in tax revenue have been sluggish. Low level of economic diversification limits the extent to which Bhutan can further increase net revenue from taxes on income, profits, and goods and services. Improving the tax administration system and simplifying the tax system remains critical to enhance tax revenue. The introduction of GST and Bhutan Integrated Taxation System (BITS) are invaluable steps in this regard and are expected to enhance revenue generation in the medium term. The responsibile agencies for reporting private resources mobilized by private sector are the Department of Revenue and Customs (DRC) of the Ministry of Finance and the Royal Monetary Authority (RMA) of the Royal Government of Bhutan.

Tier 2: Table 3 International and domestic private resources

Year	Title of project, programme, activity or other	Total Amount USD	Financial Instrument	Type of institution	Recipient	Additional Information
	Total	0				

Please provide methodological information relevant to data presented in table 3

Has your country taken measures to encourage the private sector as well as non-governmental organizations, foundations and academia to provide international and domestic resources for the implementation of the Convention?

General comments

For International and Domestic Private Resources, Bhutan reported only Tier 1 as it is difficult to report Tier 2 due to lack of complete information. For information used in reporting in Tier 1, please refer the following sources: 1. Resource Mobilization for Sustainable LDC Graduation of Bhutan February 2022, a Development Paper by Mr. Tandin Wangchuk and submitted to Economic and Social Commission for Asia and the Pacific (ESCAP. 2. The Department of Revenue and Customs of the Ministry of Finance at www.mof.gov.bt

SO5-4 Technology transfer

Tier 1: Please provide information relevant to the resources provided, received for the transfer of technology for the implementation of the Convention, including information on trends.

Trends in international bilateral and multilateral public resources provided

- ○ Up ↑
- ◉ Stable ←→
- ○ Down ↓
- ○ Unknown ∾

Trends in international bilateral and multilateral public resources received

- ○ Up ↑
- ◉ Stable ←→
- ○ Down ↓
- ○ Unknown ∾

There is no dedicated project or programs on Technology Transfer. All the technology development, diffusion, transfer and application of new technologies are inbuilt within the broader project.

Since the resources for technology transfer are inbuilt within the overall projects and programs, the instituional arrangements are similar to the financial and non-financial resource mobilization reported earlier under SO5-1.

Tier 2: Table 4 Resources provided and received for technology transfer measures or activities

Provided Received	Year	Title of project, programme, activity or other	Amount	Recipient Provider	Description and objectives	Sector	Type of technology	Activities undertaken by	Status of measure or activity	Timeframe of measure or activity	Use, impact and estimated results	Additional Information
Total provided:			0			Total received:		0				

Please provide methodological information relevant to data presented in table 4

Include information on underlying assumptions, definitions and methodologies used to identify and report on technology transfer support provided and/or received and/or required. Please include links to relevant documentation.

Please provide information on the types of new or current technologies required by your country to address desertification, land degradation and drought (DLDD), and the challenges encountered in acquiring or developing such technologies.

General comments

Reported Tier only.

SO5-5 Future support for activities related to the implementation of the Convention

SO5-5.1: Planned provision and mobilization of domestic public and private resources

Please provide information relevant to the planned provision and mobilization of domestic resources for the implementation of the Convention, including information relevant to indicator SO5-2, as well as information on projected levels of public financial resources, target sectors and planned domestic policies.

Domestic resource mobilisation will contniue to remain a priority for the future five plans of Bhutan. While there has been improvement in domestic resource mobilisation, it falls short of Bhutan's developmental needs and Bhutan remains reliant on grant aid in the short to medium term. The increasing scarcity of donor funding, which could constrain development spending and negatively affect future growth and development, means Bhutan requires assistance to identify alternative sources of finance.

SO5-5.2: Planned provision and mobilization of international public and private resources

Please provide information relevant to the planned provision and mobilization of international resources for the implementation of the Convention, including information on projected levels of public financial resources and support to capacity building and transfer of technology, target regions or countries, and planned programmes, policies and priorities.

ODA remains critical, especially as Bhutan's structural challenges remains to be addressed even as it gears up for LDC graduation in 2023. It is critical for development partners to deliver on long-standing commitments and the ODA targets reaffirmed on target 17.2 of the 2030 Agenda for Sustainable Development. Various modes of innovative financing have been explored recently to fill up financing gaps and to enhance the role of private sector. Upscaling such initiatives and exploring alternative financing instruments will be critical for Bhutan. Accelerating the progress of critical SDGs with accurate assessment of cost of implementation, commensurate resource mobilization and investment strategies is important. While Bhutan's graduation from LDC status will have negative implications for access to the Least Developed Countries Fund (LDCF) created under the United Nations Framework Convention on Climate Change (UNFCCC), Bhutan will remain eligible for the Green Climate Fund (GCF),44 Global Environment Facility (GEF) Trust Fund, the Special Climate Fund and the Adaptation Fund. The cessation of access to LDCF — which is vital in Bhutan's effort to mitigate vulnerabilities and build resilience — will harm the country's efforts to address the challenges of vulnerability to natural disasters caused by climate change. However, belonging to the LDC category is not a condition for receiving technical assistance.

SO5-5.3: Resources needed

Please provide information relevant to the financial resources needed for the implementation of the Convention, including on the projects and regions which needs most support and on which your country has focused to the greatest extent.

ODA remains critical, especially as Bhutan's structural challenges remains to be addressed even as it gears up for LDC graduation in 2023. It is critical for development partners to deliver on long-standing commitments and the ODA targets reaffirmed on target 17.2 of the 2030 Agenda for Sustainable Development. Various modes of innovative financing have been explored recently to fill up financing gaps and to enhance the role of private sector. Upscaling such initiatives and exploring alternative financing instruments will be critical for Bhutan. Accelerating the progress of critical SDGs with accurate assessment of cost of implementation, commensurate resource mobilization and investment strategies is important. As the scale of financing required to achieve the SDGs may be beyond the scope of public finance, SDG investment mapping must be used to attract private capital. As Bhutan embarks on preparation of its 13th Five Year Plan, considerations must be made for enhancing meaningful technical cooperation between the government and its development partners such as the United Nations Development System and multilateral development banks. In particular, for the implementation of the Convention, Bhutan will continue to rely on external grants from GEF, GCF, Adaptation Fund and others.

General comments

For information reported in Tier 1 above, please refer the following sources: 1. Resource Mobilization for Sustainable LDC Graduation of Bhutan, February 2022, a Development Paper submited to Economic and Social Commission for Asia and the Pacific (ESCAP) by Tandin Wangchuk. 2. Towards Smooth Transition Strategy for Bhutan, available at: https://unctad.org/system/files/official-document/aldc2021d5_en.pdf

Financial and Non-Financial Sources

Increasing the mobilization of resources:

Would you like to share an experience on how your country has increased the mobilization of resources within the reporting period?

- (●) Yes
- ( ) No

What type of resources were mobilized (check all that apply)?

- ☒ Financial Resources
- ☐ Non-Financial

Which sources were mobilized?

- ☒ International
- ☒ Domestic
- ☒ Public
- ☐ Private
- ☐ Local communities
- ☐ Non-traditional funding sources
- ☒ Climate Finance
- ☐ Other (please specify)

Use this space to describe the experience:

The Round Table Meeting (RTM) is the highest forum for policy dialogue between Bhutan and its bilateral and multilateral development partners, including international financial institutions. The RTM is typically conducted two times in a 5-year plan period, wherein the partners review the progress made, challenges faced and the future opportunities to strengthen existing partnerships. The 12th Plan (2018-2023) had the largest budget outlay of any Plan ever at Nu. 310 billion which is an increase of 38 percent over the 11th Plan (BTN 225 billion). Even on the grants front, the government received the largest grant during the 11th Plan amounting to BTN 70 billion, which is an increase from BTN 50 billion during the 10th Plan.

What were the challenges faced, if any?

1. Lack of fund projections and mobilization strategy, and 2. The lack of national mechanism for coordination, fund mobilization and implementation of various programs of works under three Rio-Conventions.

What do you consider to be the lessons learned?

Relevant national institutions or mechanisms need to be established to support coordination, mobilization of resources and the implementation of the Convention. More importantly, it is critical to develop fund projects and mobilization strategy for effective implementtion of the Convention.

How did you ensure that women benefited from/got access to this funding?

Participation of Women in the project planning and decision making has been given priority by initiating consultative processes such Participatory SLM Action Planning and taking this processes closer to the community so that women can participate more. Other mechanisms adopted was to faciliate formation of women group in implementing project activities.

Use this space to provide any further complementary information you deem relevant:

None

Has your country supported other countries in the mobilization of financial and non-financial resources for the implementation of the Convention?

- ○ Yes
- ◉ No

Using Land Degradation Neutrality as a framework to increase investment:

From your perspective, would you consider that you have taken advantage of the LDN concept to enhance the coherence, effectiveness and multiple benefits of investments?

- ◉ Yes
- ○ No

Use this space to describe the experience:

In 2015, Bhutan joined other UNCCD Parties in the Land Degradation Neutrality (LDN) Target Setting Programme and have set voluntary LDN targets in the same year. Following this, projects were developed but were mostly driven by sector and other national priorities. In the process, some sectors like livestock got less priority and did not get financial support while other sectors such as water, forest and agriculture received better priority. Therefore, despite awareness on the advantage of the LDN, it has become a challenge to develop a holistic or all encompassing project. Further, Bhutan could not develop any Land Degradation Neutrality (LDN) Transformative projects and programmes (TPPs) and take advantage of existing financing opportunities and partnerships.

What were the challenges faced, if any?

LDN Projects require adequate financial resources, which has been the problem for Bhutan as some of the sectors could not get any funding support to implement the voluntary commitments and thus the voluntary targets remained underachieved.

What do you consider to be the lessons learned?

There is a strong need to have continued government leadership and national coordination that guides and coordinates all relevant sectors to implement LDN. It is also important to have national LDN information system and decision support system to assist informed planning and decision making. Such system will also help strengthen knowledge and experience sharing both within the country and outside. Finaly, since the implentation of LDN required substantial investment and also noting that it is difficult to develop national LDN TPP, it would be good to initiate and develop regional LDN TPP to tapp resources from different innovative financing options.

Improving existing and/or innovative financial processes and institutions

From your perspective, do you consider that your country has improved the use of existing and/or innovative financial processes and institutions?

- ◉ Yes
- ○ No

Was this through any of the following (check all that apply)?

- ☒ Existing financial processes
- ☒ Innovative financial processes
- ☒ The GEF
- ☐ Other funds (please specify)

Use this space to describe the experience:

Through the fincial support from GEF and GCF, Bhutan has made good progress and achievements in the implementation of Convention, in particular addressing land degradation, water shortage problem, livelihood improvements of affected population and restoration of degraded land. Documentation of best practices is also being initiated to share knowledge and experiences with other projects and country Parties.

What were the challenges faced, if any?

The main challenge has been the limited or inadequate financial resources.

What do you consider to be the lessons learned?

To roll out best practices at a scale and to bring about transformational change, adequate investment is critical. With the limited fund, we can focus only only in a small area and cannot adopt landscape or ecsystem approach connecting upstream and downstream. That way, we cannot implement activites holistically, by integrating end to end activities which would otherwise benefit both environment and socio-economic aspects of the affected area and population.

Did your country support other countries in the improvement of existing or innovative financial processes and institutions?

- ○ Yes
- ◉ No

Policy and Planning

Action Programmes:

Has your country developed or helped develop, implement, revise or regularly monitor your national action programme?

- (•) Yes
- ( ) No

Use the space below to share more details about your country's experience:

Bhutan ratified and became Party to the UNCCD on 20th August 2003. Since then Bhutan has been active in the implementation of the Convention. Bhutan started preparing its National Action Program to combat Land degradation (NAP LD) in 2008 and submitted its final version to the UNCCD Secertariat in 2010. The NAP LD 2010 was aligned to the 10 Year Strategy of the UNCCD in 2014 following the decision of 8th Session of the Conference of Parties (COP8), i.e. decision 3/COP.8 that urged all the affected country parties to align their action programs and other relevant implementation activities relating to the Convention with the 10 Year Strategy. The NAP LD identified in total Five Program Components and 88 Actions to be implemented by different sectors to address land degradation in country. In 2015, UNCCD Parties were invited to formulate voluntary targets to achieve LDN and accordingly Bhutan set its LDN Voluntary targets and submitted report to the UNCCD in 2014. Note: The National Action Programs to Combat Land Degradation 2010 and 2014 and the LDN Report are uploaded under "Other Files for Reporting"

Would you consider the action programmes and/or plans to be successful and what do you consider the main reasons for success or lack thereof?

The action programs are considered moderately successful as the implementation had some shortfall despite the fact that the action programs were all mainstreamed in the Five Year Plans of the relevant sectors. This was mainly because of lack of dedicated project to finance the implementation. In other words, the action programs were implemented as and when there was project support and in a piece meal manner.

What were the challenges faced, if any?

The main chhellenge faced was the lack of financial resources to implement all the action programs. Although, the action programs were mainstreamed, there was no committed or assured fund to implement in the field. Further, because of lack of fund, no proper mechanisms were put in place to coordinate and monitor the implementation process.

What do you consider to be the lessons learned?

- The national action program development process brought together different stakeholders, which was instrumental in preparing comprehensive and integrated action programs; - The action programs provided a good reference on land degtradation issues and opportunities, which was useful in preparing project proposals for funding support; - While the past action programs had strategies and actions outlined to address land degradation issues, lack of clear targets and indicators, including monitoring and evaluation mechanism, made it difficult to assess progress and achievements; - Lack of fund projections and mobilization strategy for the actions outlined in the past ation programs led to poor implementation; It is important to establish relevant institutions to coordinate and support the implementation of actions programs; and - The lack of a national mechanism for coordination, fund mobilization and implementation of various programs of works under CBD also resulted in poor implementation of past BAPs.

Policies and enabling environment:

During the reporting period, has your country established or helped establish policies and enabling environments to promote and/or implement solutions to combat desertification/land degradation and mitigate the effects of drought?

- (•) Yes
- ( ) No

These policies and enabling environments were aimed at (check all that apply):

☒ Promoting solutions to combat desertification, land degradation and drought (DLDD)

☒ Implementing solutions to combat DLDD

☐ Protecting women's land rights
☒ Enhancing women's access to natural, productive and/or financial resources
☐ Other (please specify)

How best to describe these experiences (check all that apply):

☒ Prevention of the effects of DLDD
☒ Relief efforts after DLDD has caused environmental and or socioeconomic stress on ecosystems and or populations
☐ Recovery efforts after DLDD has caused environmental and or socioeconomic stress on ecosystems and or populations
☒ Engagement of women in decision - making
☐ Implementation and promotion of women's land rights and access to land resources
☒ Building women's capacity for effective UNCCD implementation
☐ Other (please specify)

Use the space below to share more details about your country/sub-region/region/institution's experience.

The existing policies and legislations contain sufficient provisions that would contribute towards addressing the land degradation in the country. However, to translate these relevant provisions into action, proper adoption and effective implementation by the stakeholders is critical.

Do you consider these policies to be successful in promoting or implementing solutions to address DLDD, including prevention, relief and recovery, and what do you consider the main factors of success or lack thereof?

As stated above, the existing policies and legislations do provide adequate space and support to promote or implement solutions to address land degradation, including prevention, relief and recovery. The main problem lies in the effective implementation of those provisions by the relevant agencies and institutions.

What were the challenges faced, if any?

Ineffective implementation of the provisions in the policies and legislations that supports the promotion and implementation of measures to address land degradation in the country.

What would you consider to be the lessons learned?

For effective and successful implementation of measures to address land degradation, the stakeholders need to understand the provisions and enforce accordingly. There should be concerted efforts, strong collaboration and partnership among all the stakeholders to take the issue forward and harness synergy.

Has your country supported other countries in establishing policies and enabling environments to promote and implement solutions to combat desertification/land degradation and mitigate the effects of drought, including prevention, relief and recovery?

○ Yes
◉ No

Synergies:

From your perspective, has your country leveraged synergies and integrated DLDD into national plans related to other MEAs, particularly the other Rio Conventions and other international commitments?

◉ Yes
○ No

Your country's actions were aimed at (please check all that apply):

☒ Leveraging DLDD with other national plans related to the other Rio Conventions

☒ Integrating DLDD into national plans
☒ Leveraging synergies with other strategies to combat DLDD
☒ Integrating DLDD into other international commitments
☐ Other (please specify)

Use the space below to describe your country's experience.

The national plans of other two Rio Conventions - National Biodiversity Action Plan (NBSAP) for CBD and National Adaptation Plan of Action (NAPA) for UNFCCC have integrated some of the relevant action programs of the land degradation. Likewise, the National Action Program to Combat Land Degradation also contains action programs related to Climate change and biodoversity.

Do you consider this experience a success and, if so, what do you consider the reasons behind this success (or lack thereof)?

The integration of action plans in the Multilateral Environmental Agreements, particularly in three Rio Conventions is a postive experience. This was possible because of realization by the national focal points and the agencies about the need to work together to adress interconnected issues, while avoiding duplication of efforts and waste of limited resources and nost importantly harness synergy.

What were the challenges faced, if any?

The challenge still lies with the lack of sincere coordination and collaboration among the Rio Conventions and other MEAs.

What would you consider to be the lessons learned?

There is a need to establish mechanism at the national level to coordinate overall planning, resource mobilization and implementation of projects and programs. Currently, the projects and programs are largely sector driven and is diffult to address cross-cutting issues and problems effectively.

Mainstreaming desertification, land degradation and drought:

From your perspective, did your country take specific actions to mainstream, DLDD in economic, environmental and social policies, with a view to increasing the impact and effectiveness of the implementation of the Convention?

◉ Yes
○ No

If so, DLDD was mainstreamed into (check all that apply):

☒ Economic policies
☒ Environmental policies
☐ Social policies
☒ Land policies
☐ Gender policies
☒ Agricultural policies
☐ Other (please specify)

Use the space below to describe your country's experience.

The issue of land degradation is already mainstreamed in the existing policies and legislations. It is also well mainstreamed in the overall national development plans and programs of Central and local governments. To strenghten this mainstreaming efforts, the National Soil Services Centre of the Department of Agriculture under the Ministry of Agriculture and Livestock is undertaking campaigns and advocacy programs at the community, district and the national level. Infact, sensitization programs SLM to combat land degradation are also targeted to the Parlimentarians of both the houses - National Council and National Assembly. Same is also being organized for other lecetd leaders of the district and sub-district levels.

Do you consider this experience a success and, if so, what do you consider the reasons behind this success (or lack thereof)?

The above initiatives have been very successful as now we can see activities related to land degradation being reflected in the five year and annual plans of the local and the central governments. The leaders are aware and have recognition on the importance of SLM to combat land degradation and to conserve biodiversity and adapt to and mitigate climate change.

What were the challenges faced, if any?

The challenge still is the level of priority given by the planners, decision and policy makers. Despite their understanding, the land degradation still received less priority in terms of investment, both international and domestic financial resource allocation.

What would you consider to be the lessons learned?

There is a need to continue scaling up advocacy program at all levels through campaign, sensitization, awareness, seminar, lecture, presentation, etc. on the importance of SLM, not only to address land degradation, but range of other issues, including climate change, biodiversity loss, drought, livelihoods, etc. It is so critical to tell and convince that the land is the basis through which the above problems can be addressed or their situation can be improved.

Drought-related policies:

Has your country established or is your country establishing national policies, measures and governance for drought preparedness and management?

- ○ Yes
- ◉ No

Has your country supported other countries in establishing policies, measures and governance for drought preparedness and management, in accordance with the mandate of the Convention?

- ○ Yes
- ◉ No

Action on the Ground

Sustainable land management practices:

Has your country implemented or is your country implementing sustainable land management (SLM) practices to address DLDD?

- (●) Yes
- ( ) No

What types of SLM practices are being implemented?

- ☒ Agroforestry
- ☒ Area closure (stop use, support restoration)
- ☒ Beekeeping, fishfarming, etc
- ☒ Cross-slope measure
- ☒ Ecosystem-based disaster risk reduction
- ☒ Energy efficiency
- ☒ Forest plantation management
- ☒ Home gardens
- ☒ Improved ground/vegetation cover
- ☒ Improved plant varieties animal breeds
- ☒ Integrated crop-livestock management
- ☒ Integrated pest and disease management (incl. organic agriculture)
- ☒ Integrated soil fertility management
- ☒ Irrigation management (incl. water supply, drainage)
- ☐ Minimal soil disturbance
- ☒ Natural and semi-natural forest management
- ☒ Pastoralism and grazing land management
- ☒ Post-harvest measures
- ☒ Rotational system (crop rotation, fallows, shifting, cultivation)
- ☒ Surface water management (spring, river, lakes, sea)
- ☒ Water diversion and drainage
- ☒ Water harvesting
- ☒ Wetland protection/management
- ☐ Windbreak/Shelterbelt
- ☒ Waste management / Waste water management
- ☐ Other (please specify)

Use the space below to share more details about your country's experience:

Recognizing the vulnerabilities of steep slope agriculture, as early as the 5th FYP (1981-1987), sustainable land management (SLM) efforts by the farmers were supported by the government with cash incentives. For example, government paid Nu. 300 and Nu. 200 per acre for land terracing and construction of contour stone bunds, respectively. However, due to shift in the developmental priorities of the government over the years, SLM incentives were stopped and along with this, farmers‟ SLM efforts slowly dwindled by 7th FYP. With the devastating impacts of the 2004 flash flood incidence in the entire eastern region of the country, the focus on SLM was heightened with various programs and projects aiming to promote SLM, especially in vulnerable agriculture land, to mitigate soil erosion and other forms of land degradation. Although the 11th FYP (2013-18) emphasised the importance of SLM to address land degradation problems, the scope was limited due to resource constraints. However, during the 12th FYP (201-2023), SLM program is set to receive high priority for the Ministry to increase crop production and help alleviate rural poverty while also addressing land degradation problems and related issues in the country. With increasing population and rapid socio-economic development taking place in the country, the competition for good agriculture land from various other sectors is slowly forcing more marginal lands to be brought under cultivation to meet the food demand. On the contrary, huge areas of agriculture land are left fallow due to land degradation, low land productivity, farm labour shortage, wildlife depredation, and scarcity of water for irrigation. With all these challenges impacting food security goal and ecosystem services delivery, properly planned SLM is critical to bring more agriculture land under sustainable production. Further, it would also facilitate to ease farm labour shortage through mechanization, mitigate land degradation, and enhance agro- ecosystem services.

Would you consider the implemented practices successful and what do you consider the main factors of success?

SLM interventions through various projects and programs thus far have been very successful. The main driving factors are: 1) the awareness and advocacy program on the importance of SLM in combating land degradation, drought and adaptation to climate change impacts conducted by the Ministry of Agriculture and Livestock; 2) increasing recognition of the importance of SLM by the land owners and their willingness to adopt SLM technologies; 3) mainstreaming of SLM into local and national development plans and policies as a result of better understanding and appreciation by the local elected leaders and national policy and decision makers; and 4) financial and technical support provided by different projects and programs.

What were the challenges faced, if any?

The main challenges facing SLM implementation in Bhutan are: 1) Limited financial resources to roll out SLM at a scale; 2) limited landholding which are scattered and fragmented; 3) long gestation period of SLM interventions while farmers (especially resource poor farmers) are looking for immediate returns; 4) lack of farm labour in the villages discourages farmers from adopting labour intensive SLM technologies; 5) the use of machines in bench terracing is costly whereby area coverage is limited due to less budget, but farmers interest is more in bench terracing; and 6) Other difficulties such as human-wildlife conflict, poor market access, poor return from agriculture, etc. are also discouraging farmers from making investment in SLM.

What do you consider to be the lessons learned?

The main lessons learned are: 1) Participatory SLM Action Planning - This is a community based planning approach or process, which encourages all the stakeholders to partake in the planning and decision making of SLM interventions; 2) Community mobilization - The idea is to address farm labour shortage problem in the villages by mobilizing community through informal labour sharing groups. On rotation basis, the land owners undertake SLM interventions such as establishment of contour hedgerows, stone bunds, check dam and plantation in the degraded and vulnerable areas thereby enabling land owners with no farm labour and who are aged to avail project support and take up SLM interventions in their land, without which it would be difficult to adopt such labour intensive technologies. 3) Social cohesion - Through revival of traditional labour sharing practice, which has been on declining state, has helped enhanced social capital in the community.

How did you engage women and youth in these activities?

The engagement of women and youths in the SLM interventions are given high priority. This is done by ensuring equal or more participation of women in the planning and the capacity building programs supported by different projects. And where possible, formal or informal women groups are formed to undertake SLM implementation in the villages.

Has your country supported other countries in the implementation of SLM practices?

- ○ Yes
- ◉ No

Restoration and Rehabilitation:

Has your country implemented or is your country implementing restoration and rehabilitation practices in order to assist with the recovery of ecosystem functions and services?

- ◉ Yes
- ○ No

What types of rehabilitation and restoration practices are being implemented?

- ☒ Restore/improve tree-covered areas
- ☒ Increase tree-covered area extent
- ☒ Restore/improve croplands
- ☒ Restore/improve grasslands
- ☒ Restore/improve wetlands
- ☒ Increase soil fertility and carbon stock
- ☒ Manage artificial surfaces

☒ Restore/improve protected areas
☐ Increase protected areas
☐ Improve coastal management
☒ General instrument (e.g. policies, economic incentives)
☒ Restore/improve multiple land uses
☒ Reduce/halt conversion of multiple land uses
☒ Restore/improve multiple functions
☒ Restore productivity and soil organic carbon stock in croplands and grasslands
☐ Other/general/unspecified

Use the space below to share more details about your country's experience:

The rehabilitation and restoration practices are implemented by different agencies. In the arable land, the rehabilitation and restoration works are initiated by the Department of Agriculture whereas in the forest areas and in the grasslands, it is taken up by the Department of Forests and Park Services and the Department of Livestock respectively. The civil society organization (CSO) such as Tarayana Foundation and the Royal Society for the Protection of Nature (RSPN) are also involved in such rehabilitation and restoration works.

Would you consider the implemented practices successful and what do you consider the main factors of success?

The past rehabilitation and restoration interventions have been implemented successfully because of the following reasons: 1) The country has limited arable land (only 7% of the total country area) which is largely located on steep slopes due to mountainous terrain and are highly vulnerable to land degradation; 2) The Constitution of the Kingdom of Bhutan 2008 requires 60% of the country area under Forest cover for all times to come; 3) The promotion of Community based Natural Resources Management and Utilization encourages local action to enhance its productivity and sustainability; 4) The quality of grasslands or grazing areas is increasingly declining because of overgrazing, poor management and encroachment by unwanted shrubs or woody species.

What were the challenges faced, if any?

The main challenges include: 1) Poor coordination and collaboration among the agencies; and 2) Limited financial resources to scale out rehabilitation and restoration best practices and other learning experiences at large scale.

What do you consider to be the lessons learned?

The main lessons learned are: 1) The landscape approach in the implementation of rehabilitation and restoration works that connects upstream and downstream; 2) Multisectoral approach involving key stakeholders in the planning, implementation and monitoring of rehabilitation and restoration projects; and 3) Balancing long term restoration works with the short term livelihood needs of the targeted communities especially vulnerable communities and households.

How did you engage women and youth in SLM activities?

The engagement of women and youth in SLM activities is ensured by giving equal opportunity (e.g. by inviting 50:50 male and female) in the planning and capacity building processes. Further, planning and capacity building programs are taken closer to the community to enable more women and youth participation. And depending upon the interest of the women and youths in the community, informal and formal groups of women and youths are formed to undertake SLM activities in their community.

Has your country supported other countries with restoration and rehabilitation practices in order to assist with the recovery of ecosystem functions and services?

○ Yes
◉ No

Drought risk management and early warning systems:

Is your country developing a drought risk management plan, monitoring or early warning systems and safety net programmes to address DLDD?

◉ Yes
○ No

If so, DLDD was mainstreamed into (check all that apply):

☐ A drought risk management plan
☒ Monitoring and early warning systems
☐ Safety net programmes

Use the space below to describe your country's experience.

Even though information and data on droughts in Bhutan is limited, there have been sporadic cases of drought reported in the media. Such droughts are mainly caused by delayed rainfall and changing rainfall pattern. The Bhutanese farming system is predominantly rainfed and is highly sensitive to climate variability and extreme weather events triggered by climate change. Changing rainfall patterns and climate related hazards pose high risks to the farming communities. Farmers frequently experience crop losses due to droughts, windstorms, hailstorms, disease outbreaks and erratic monsoon. Therefore, to adapt and mitigate to these elements, Agromet Decision Support System (ADSS) has been initiated by the Department of Agriculture in collaboration with the National Centre for Hydrology and Meteorology (NCHM) to provide effective agromet services to the farming communities. The NCHM is the nodal agency to generate and maintain weather data and provide weather and climate services. The weather data and forecasts generated by NCHM is generic and is of limited use to agriculture sector as the data is not converted to usable form to provide timely agriculture related weather advisory services to the farming communities. Therefore the agro-meteorology program was instituted within the Department of Agriculture to translate weather/climate information for location specific agriculture needs, communicate and disseminate them to the farming communities. The NCHM has also initiated drought monitoring system.

Do you consider this experience a success and, if so, what do you consider the reasons behind this success (or lack thereof)?

The Agromet Decision Support System (ADSS) of the Agro-meteorology Program under the Department of Agriculture and in collaboration with the National Centre for Hydrology and Meteorology (NCHM) is a recent initiative, but good progress has been made. Already Bhutanese farmers and public in general have started realizing the usefulness of the short term weather forecasts such as 1-10 days rainfall and temperature, which enables them to make farm decisions such as cultivation, fertiliser application, transplanting, sowing, pesticide application, irrigation and so on. Going forward, the NCHM will strengthen the monitoring of drought in the country including data generation. Currently the NCHM is piloting drought watch platform to monitor drought presence or absence in the country.

If you have or are developing a drought risk management plan as part of the Drought Initiative, please share here your experience on activities undertaken?

Noting that drought is not a serious problem in Bhutan, no drought risk management plan has been initiated. But recognizing the risk of drought in future because of climate climate variability and extreme weather events, initiatives will be taken to discuss with the NCHM and other relevant agencies to prepare drought risk management plan for Bhutan.

What were the challenges faced, if any?

The main challenges faced are: 1) The lack of historical data of drought and climate of Bhutan in general; 2) The limited capacity and facilities to generate weather and climate information and provide effective services; and 3) Limited financial resources.

What would you consider to be the lessons learned?

Although it is at a very early stage, yet the initiative has proven to be very useful. We need to build and strengthen further by establishing more real time or smart weather stations including soil sensors across the country to account micro-climate information including soil information and give better forecast.

Has your country supported other countries in developing drought risk management, monitoring and early warning systems and safety net programmes to address DLDD?

○ Yes
◉ No

Alternative livelihoods:

Does your country promote alternative livelihoods practice in the context of DLDD?

◉ Yes
○ No

Could you list some practices implemented at country level to promote alternative livelihoods?

☒ Crop diversification
☒ Agroforestry practices
☒ Rotational grazing
☒ Rain-fed and irrigated agricultural systems
☒ Small vegetable gardens
☒ Production of artisanal goods
☒ Renewable energy generation
☒ Eco-tourism
☒ Production of medicinal and aromatic plants
☐ Aquaculture using recycled wastewater
☐ Other (please specify)

Use the space below to describe your country's experience.

Among various alternative livelihoods promoted, the most beneficial and impactful have been brought by crop diversification, agroforestry, vegetable cultivation and water harvesting ponds. As part of crop diversification, priority has been given in promoting high value and off-season vegetables (chili, tomato, onion, cauliflower and beans).

Do you consider this experience a success and, if so, what do you consider the reasons behind this success (or lack thereof)?

The experiences gained can be largely considered as positive as through this initiative, various modern technologies could be promoted and adopted by farmers, e.g. green house cultivation, smart irrigation water use through drip irrigation and sprinkler, fertigation, plastic mulching, plug and tray nursery raising, mechanized bed making and proper sorting and packaging. This was possible because of special economic contingency plan provided by the government and to tale advantage of the market.

What were the challenges faced, if any?

There are two primary challenges: 1) High investment cost in the production of off-season vegetables; 2) Competition from cheap imported vegetables.

What would you consider to be the lessons learned?

The main lessons learned has been that while it is possible to produce off-season vegetables in Bhutan, investment costs are quite high. As a result, sustainability and continuity is becoming a serious concern with some of the farmers.

Do you consider your country to be taking special measures to engage women and youth in promoting alternative livelihoods?

◉ Yes
○ No

Please elaborate

For alternative livelihoods program, women and youths have been engaged mainly through production and marketing groups.

Establishing knowledge sharing systems:

Has your country established systems for sharing information and knowledge and facilitating networking on best practices and approaches to drought management?

◉ Yes

- [ ] No

Please use this space to share/list the established systems available in your country for sharing information and knowledge and facilitating networking on best practices and approaches to drought management.

Two primary types of drought may affect Bhutan: meteorological (usually associated with a precipitation deficit) and hydrological (usually associated with a deficit in surface and subsurface water flow, potentially originating in the region's wider river basins). Agricultural drought may also occur when water availability constraints interact with crop choices and land management practices. Bhutan is projected to experience an overall increase in rainfall. As defined by the standardized precipitation evaporation index (SPEI), −2 indicates severe drought, however Bhutan shows a near 0.5 index, indicating an increase in precipitation through the end of the century. This is projected to increase to 4%–10% by the 2090s depending on RCP emissions pathway (Source: Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank). Therefore, noting future risk from drought, the National Centre for Hydrology and Meteorology (NCHM) under the GCF project and with the support from the ICIMOD, has started piloting drought watch platform based on satellite data for providing information and services on drought and indices that are relevant to the users from the agriculture sector. The platform is a tool to monitor the presence or absence of drought. Furhtermore, changing rainfall pattern and climate related hazards pose high risk to the Bhutanese farming communities. Noting the sensitivity of the Bhutanese farming to climate variability and extreme weather events triggered by climate change, the Department of Agriculture in collaboration with the NCHM has intiated Agro-meteorological Decision Support System of Bhutan, which is a web-based system (www.agromet.gov.bt) that integrates weather forecast from NCHM and RIMES forecats. The system provides realtime monitoring, data analysis and comprehensive analytical tools and statistical information to support decision making across a range of temporal and spatial scale. Today, farmers get short term weather forecasts such as 1-10 days rainfall and temperature based on which they can make farm decisions regarding cultivation, fertilizer application, transplanting, sowing, pesticide application, irrigation and so on.

Do you consider this experience a success and, if so, what do you consider the reasons behind this success (or lack thereof)?

While the information on drought using drought watch platform is yet to be realised, the short term weather forecast has helped farming communities immensely. Farmers coul make informed prior farm decison based on the weather forecast.

What were the challenges faced, if any?

The Agro-meteorological Decision Support System under the Agro-meteorology program is still in piloting phase and there is a long way to go before the human capacity is fully built and services are effectively delivered. This will need financial resources to scale out and also to install realtime equipment across the country to get more data from different parts of the country as there is huge variation due to micro-climatic conditions.

What would you consider to be the lessons learned?

Agro-meteorology Program is a good initiative. It has already started giving the benefit to the farmers. But more investments need to be made to strengthen and improve the weather forecast and the services delivery to the farmers and the public in general. More realtime equipment need to be established to collect diverse and more realistic data so that the forecast can be more relevant and true. Most importantly, investment will have to be made in drought monitoring and information generation by strengthening facilities and capacity of the staff working at the NCHM.

Do you consider that your country has implemented specific actions that promote women's access to knowledge and technology?

- [ ] Yes
- [x] No

AI: Additional indicators

Which additional indicator is your country using to measure progress towards strategic objectives 1, 2, 3 and 4?

Indicator	Relevant strategic objective	Change in the indicator	Comments
1. Sustainable Utilization and Management of Natural Resources	SO1	Increasing	Constitutional mandate to maintain 60% of the Country area under forest cover for perpetuity
1. Poverty reduced and MDG Plus achieved, 2) Needs of Vulnerable Groups addressed, 3) Gender friendly environment for Women participation	SO2	Increasing	Poverty rate reduced from 12% in 2012 to 8.2% in 2017
1. Improved Disaster Resilience and Management Mainstreamed, 2) Water security	SO3	Increasing	Early warning and monitoring system put in place, especially floods
1. Carbon Neutral/Green and Climate Resilient Development	SO4	No change	Bhutan committed to remain carbon neutral

RC: Recalculations

RC.T1: Recalculation of the baseline period, as reported in 2018.

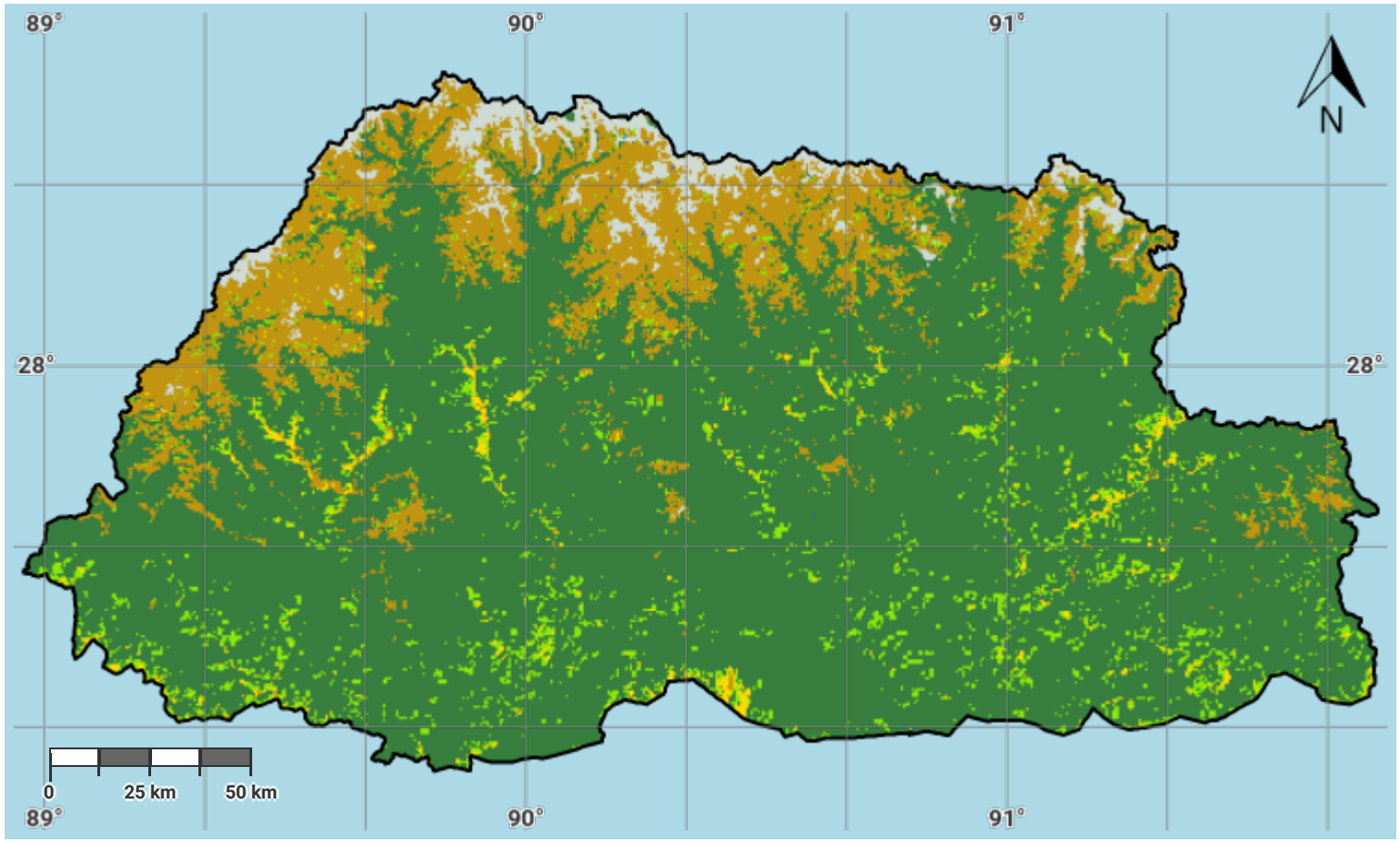
Indicator recalculated	Justifications	Explanatory information	Quantitative impact of the recalculations on baseline	Impact of the recalculations on national targets
SO1-1 Trends in land cover	☒ Changes in methodology ☐ New and improved data ☐ Correction of errors in a previous version of the data ☐ Other adjustment	Default data from European Satellite Agency (ESA) has been analysed and improved using appropriate algorithms and Google Earth Engine (GEE) and further validated by a team of national experts in a participatory workshop with technical inputs from WOCAT experts.		
SO1-2 Trends in land productivity or functioning of the land	☒ Changes in methodology ☐ New and improved data ☐ Correction of errors in a previous version of the data ☐ Other adjustment	Default data from European Satellite Agency (ESA) has been analysed and improved using appropriate algorithms and Google Earth Engine (GEE) and further validated by a team of national experts in a participatory workshop with technical inputs from WOCAT experts.		
SO1-3 Trends in carbon stocks above and below ground	☒ Changes in methodology ☐ New and improved data ☐ Correction of errors in a previous version of the data ☐ Other adjustment	Default data from European Satellite Agency (ESA) has been analysed and improved using appropriate algorithms and Google Earth Engine (GEE) and further validated by a team of national experts in a participatory workshop with technical inputs from WOCAT experts.		
SO1-4 Proportion of degraded land over the total land area	☒ Changes in methodology ☐ New and improved data ☐ Correction of errors in a previous version of the data ☐ Other adjustment	Default data from European Satellite Agency (ESA) has been analysed and improved using appropriate algorithms and Google Earth Engine (GEE) and further validated by a team of national experts in a participatory workshop with technical inputs from WOCAT experts.		

Other files for Reporting

Bhutan - SO5-1 recipient	Download	10.9 KB
GCF Projects in Bhutan	Download	10.0 KB
GEF Projects in Bhutan	Download	44.2 KB
Project Profile of Ministry of Agriculture & Livestock	Download	612.9 KB
List of Policies & Legislations_BTN	Download	11.7 KB
NAP 2010_Bhutan	Download	2.2 MB
NAP Aligned 2014_Bhutan	Download	20.8 MB
LDN Report 2015_Bhutan	Download	573.6 KB

Bhutan – SO1-1.M1

Land cover in the initial year of the baseline period



Legend

- Forests
- Shrublands
- Grasslands
- Croplands
- Artificial
- Other lands
- Water bodies
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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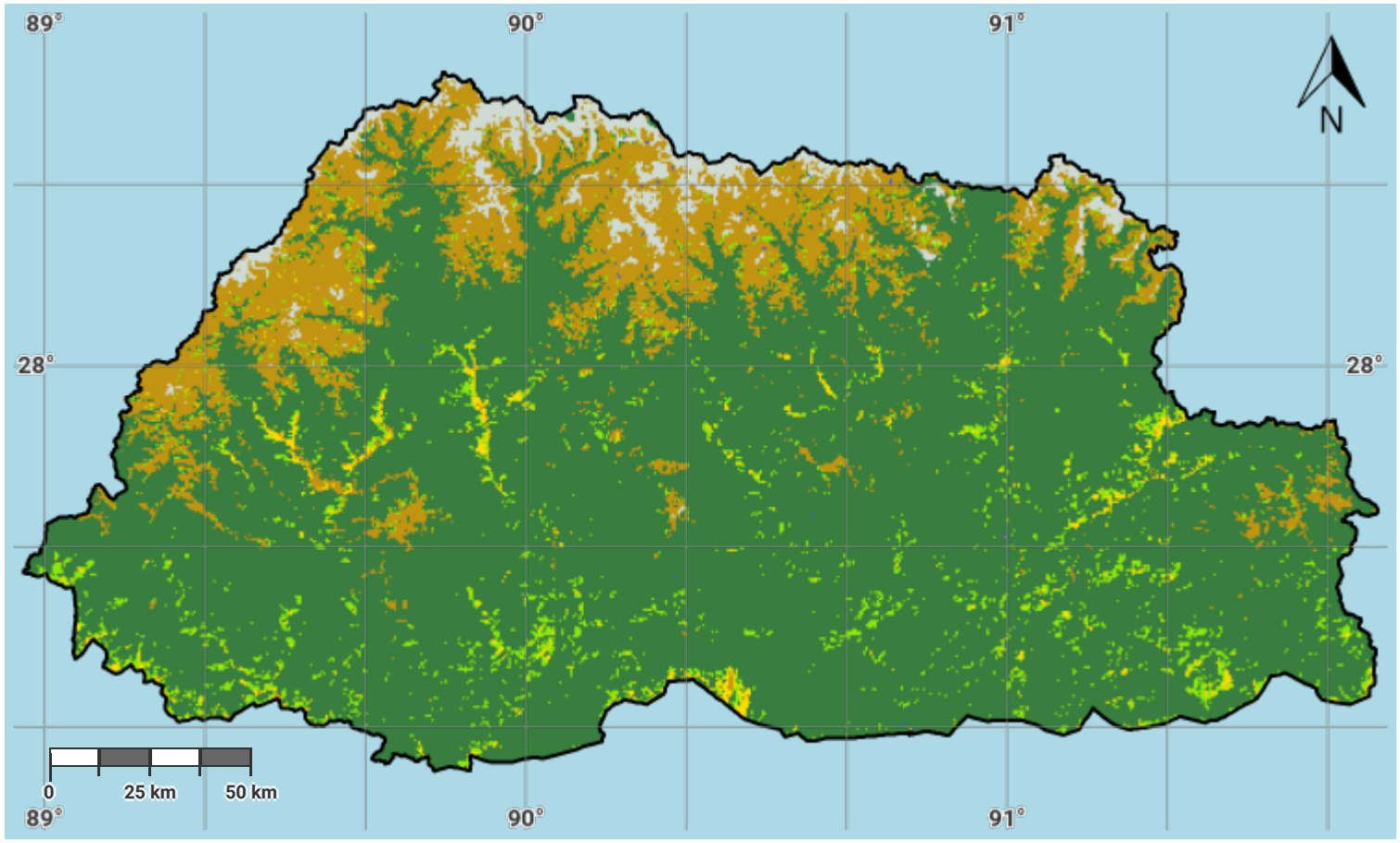
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- http://www.esa-landcover-cci.org

Bhutan – SO1-1.M3

Land cover in the latest reporting year



Legend

- Forest lands
- Shrublands
- Grasslands
- Croplands
- Artificial
- Other lands
- Water bodies
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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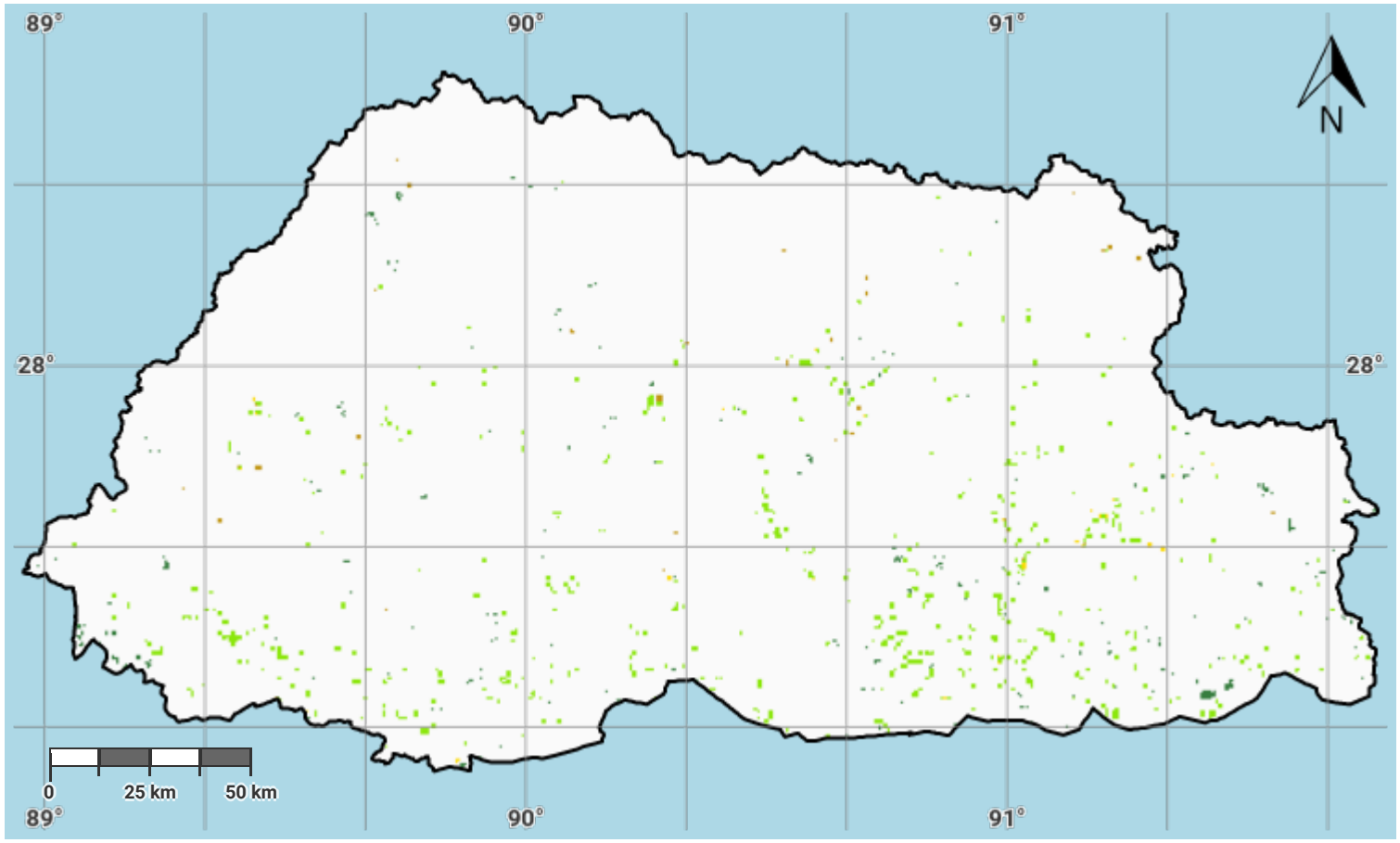
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- Land Cover Map of Bhutan 2019, National reclassification of ESA CCI Land cover map for PRAIS4.

Bhutan – SO1-1.M4

Land cover change in the baseline period



Legend

- No change
- Forests loss
- Shrublands loss
- Grasslands loss
- Croplands loss
- Artificial loss
- Other lands loss
- Water bodies loss
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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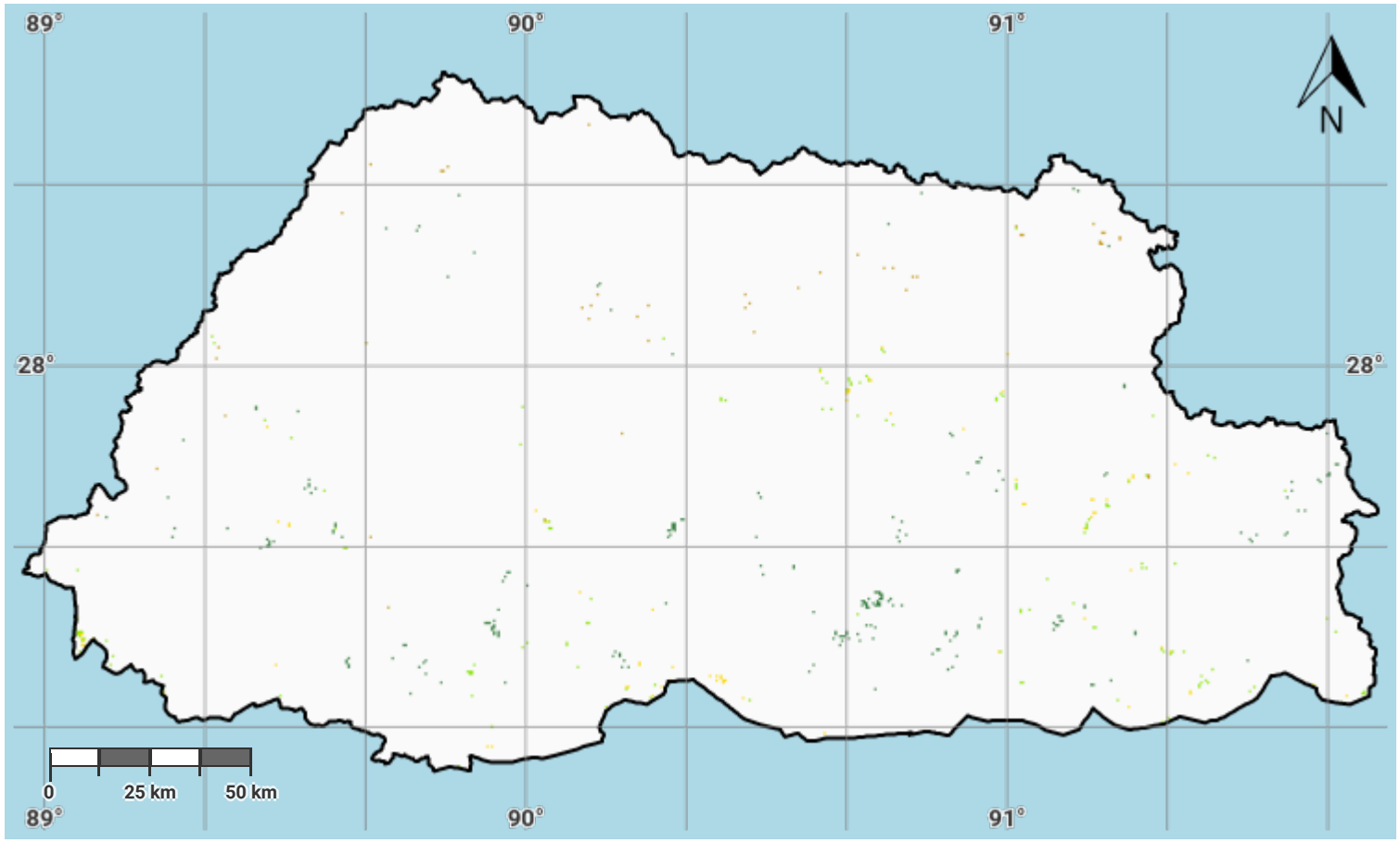
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Center, Department of Agriculture, Ministry of Agriculture and Livestock of Bhutan. PRAIS4 National Land Cover Transition Map of Bhutan for Baseline period (2000-2015) using National reclassification of ESA CCI (http://www.esa-landcover-cci.org)

Bhutan – SO1-1.M5

Land cover change in the reporting period



Legend

- No change
- Forests loss
- Shrublands loss
- Grasslands loss
- Croplands loss
- Artificial loss
- Other lands loss
- Water bodies loss
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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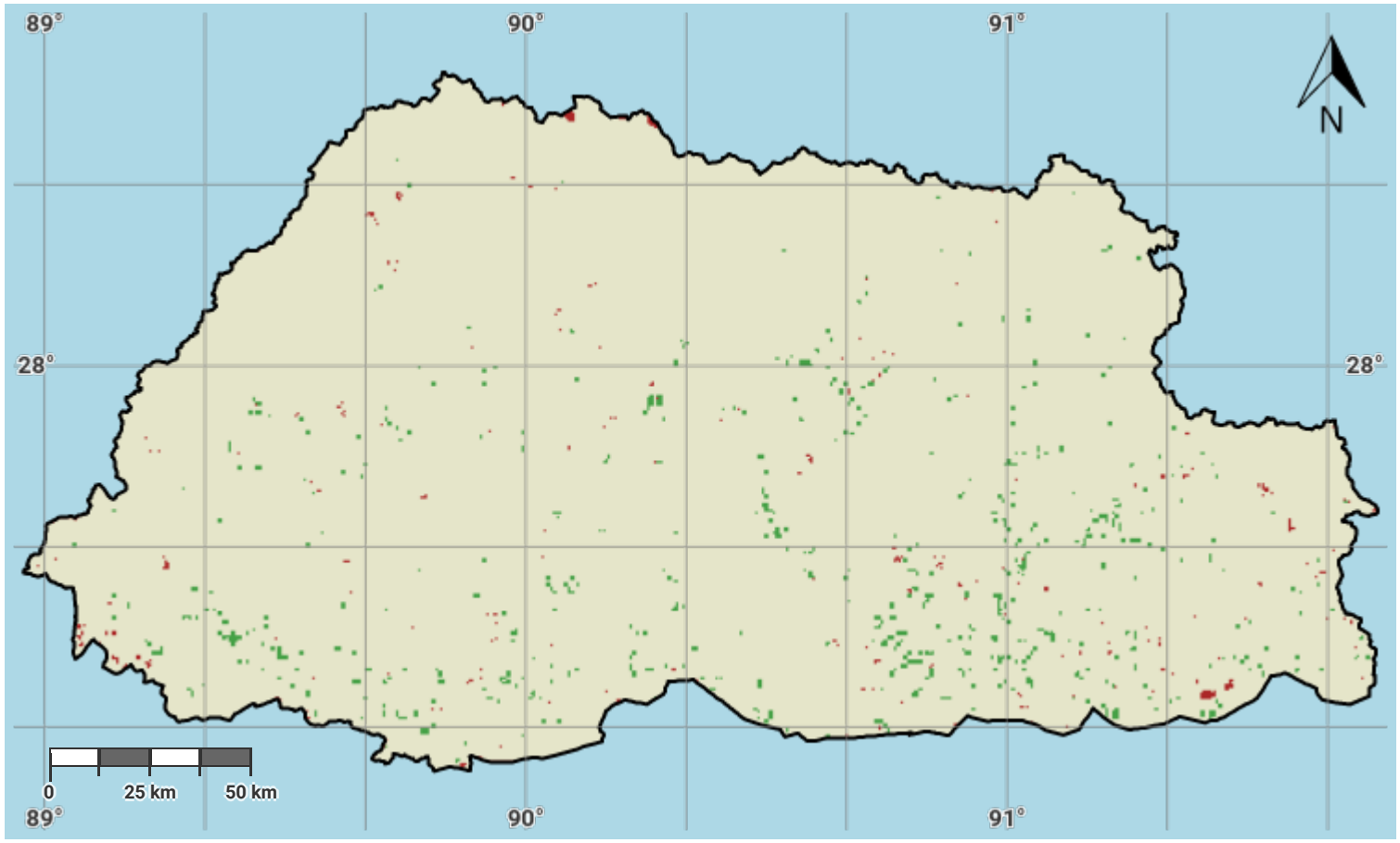
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Center, Department of Agriculture, Ministry of Agriculture and Livestock of Bhutan. PRAIS4 National Land Cover Transition Map of Bhutan for Baseline period (2015-2019) using National reclassification of ESA CCI (http://www.esa-landcover-cci.org)

Bhutan – SO1-1.M6

Land cover degradation in the baseline period



Legend

- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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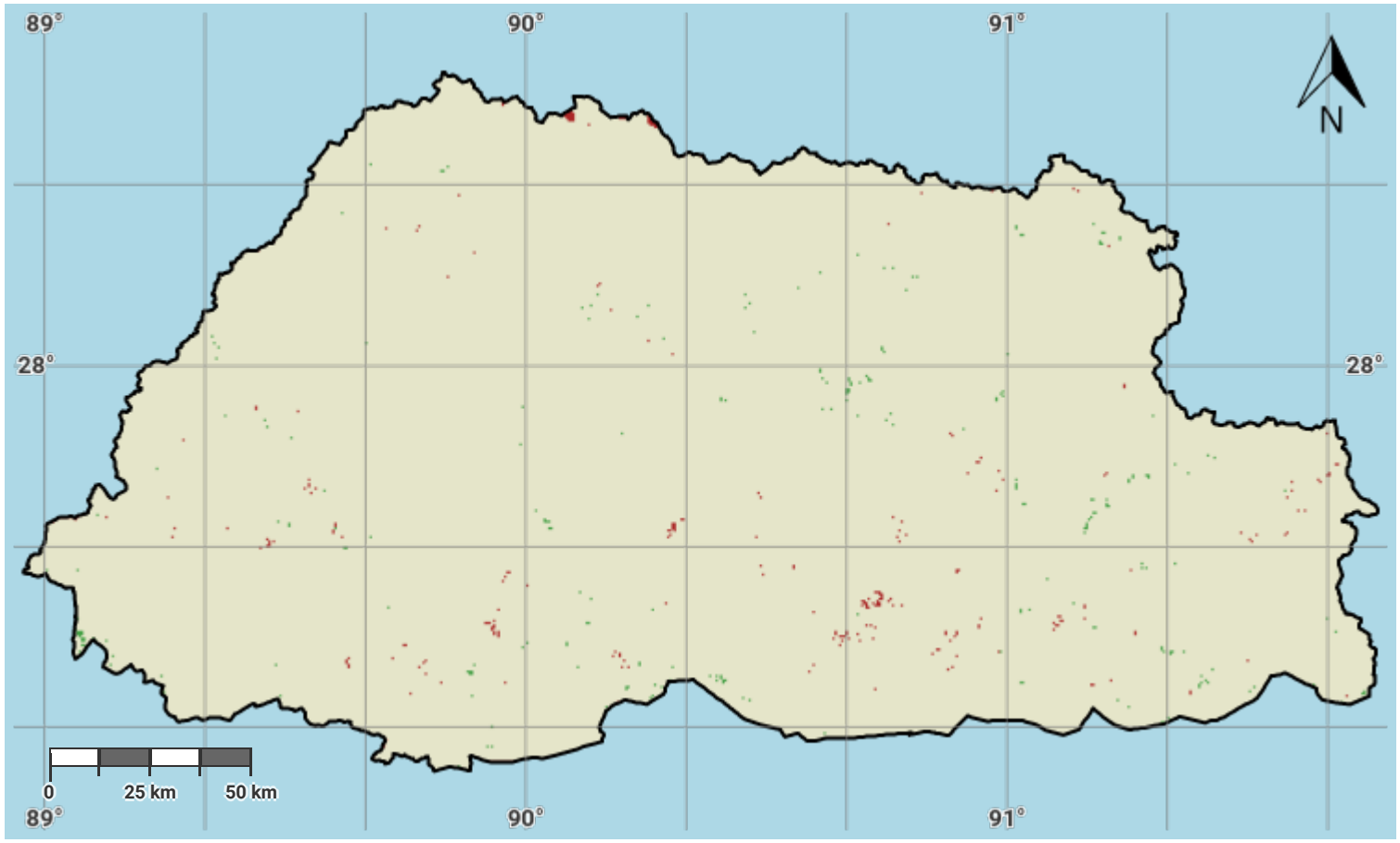
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Center, Department of Agriculture, Ministry of Agriculture and Livestock of Bhutan. PRAIS4 National Land Cover Degradation Map of Bhutan baseline period

Bhutan – SO1-1.M7

Land cover degradation in the reporting period



Legend

- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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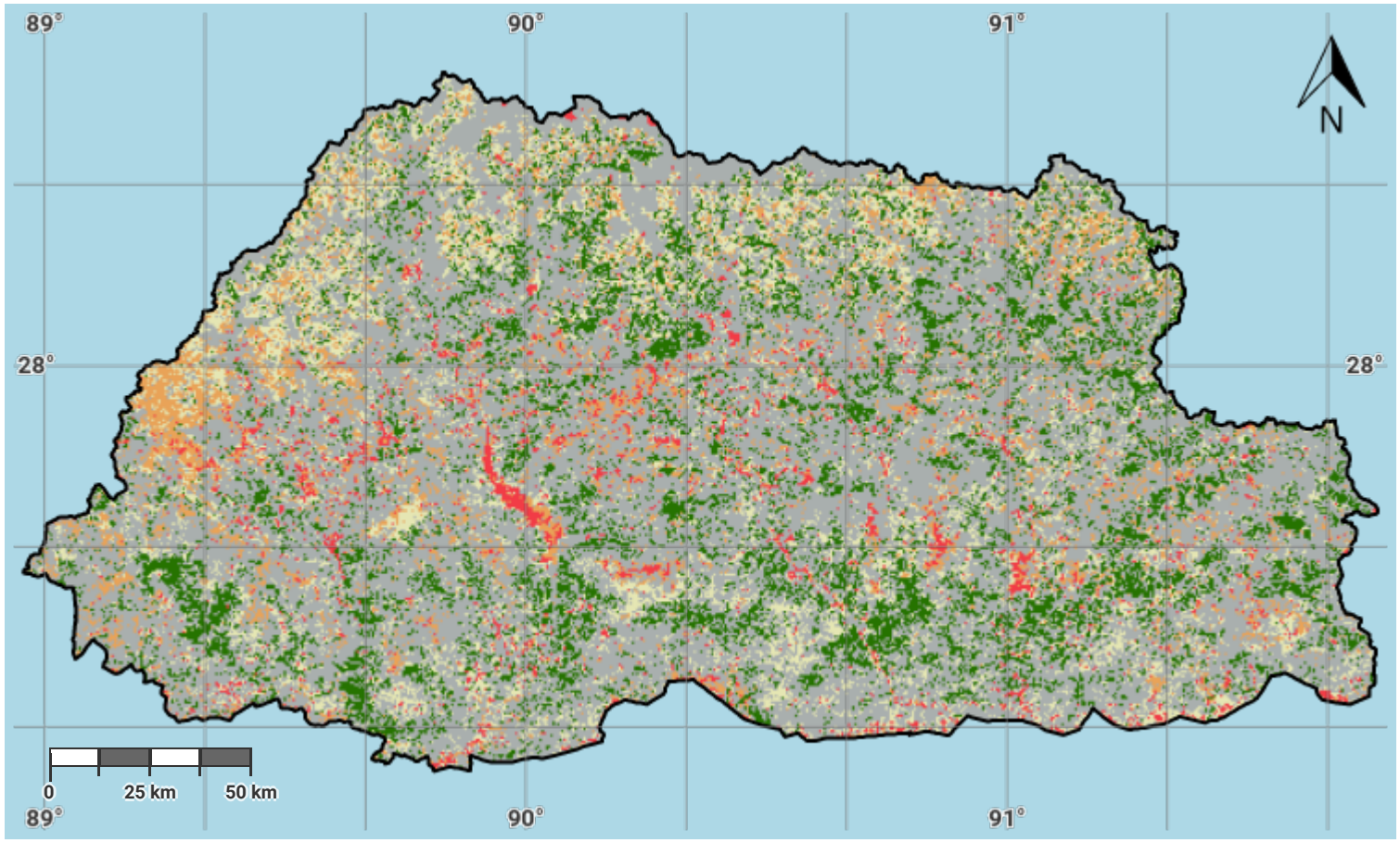
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Center, Department of Agriculture, Ministry of Agriculture and Livestock of Bhutan. PRAIS4 National Land Cover Degradation Map of Bhutan reporting period (2015-2019)

Bhutan – SO1-2.M1

Land productivity dynamics in the baseline period



Legend

- Declining
- Early sign of decline
- Stable but stressed
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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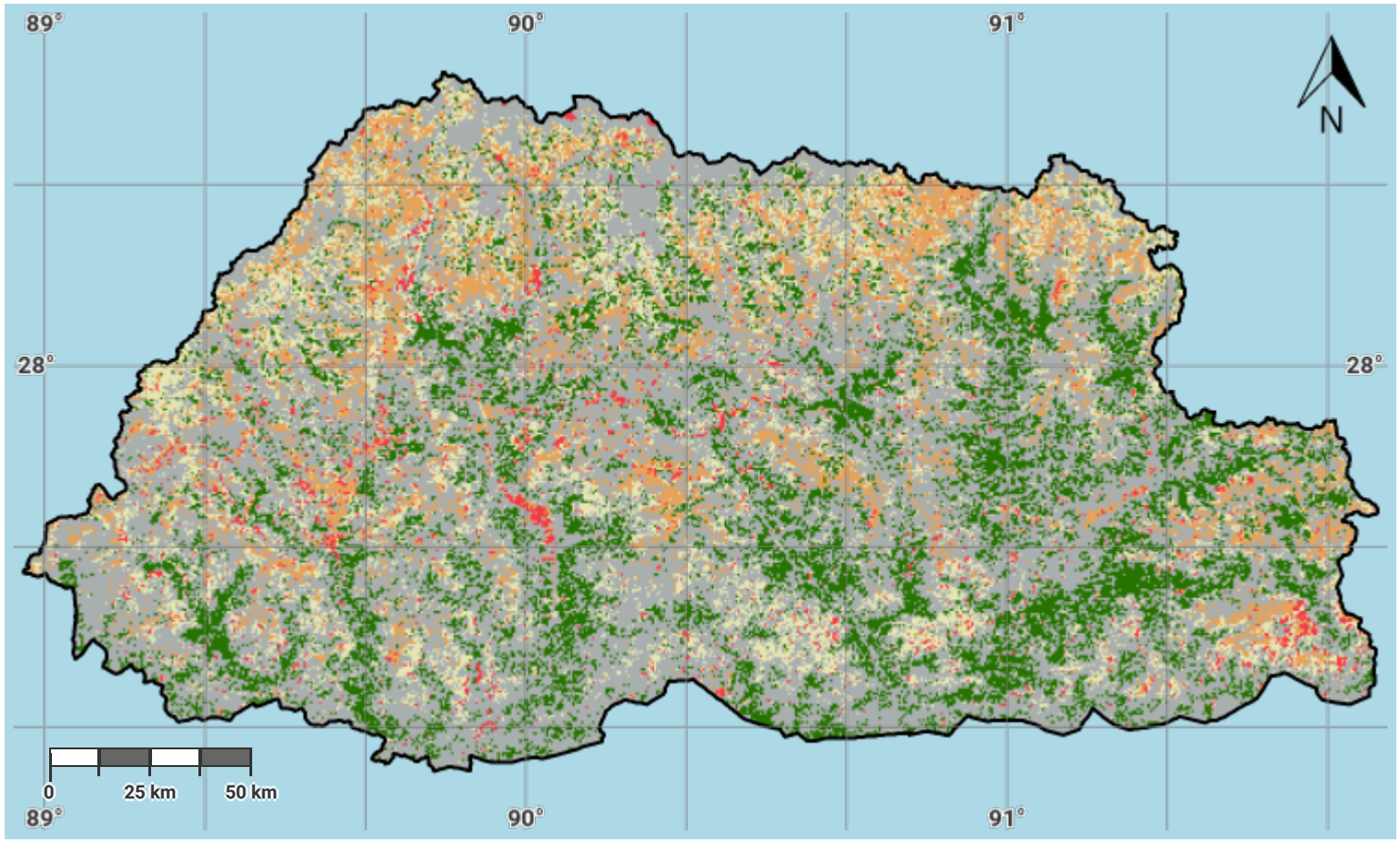
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, WOCAT, LPD Map Bhutan for Baseline Period

Bhutan – SO1-2.M2

Land productivity dynamics in the reporting period



Legend

- Declining
- Early sign of decline
- Stable but stressed
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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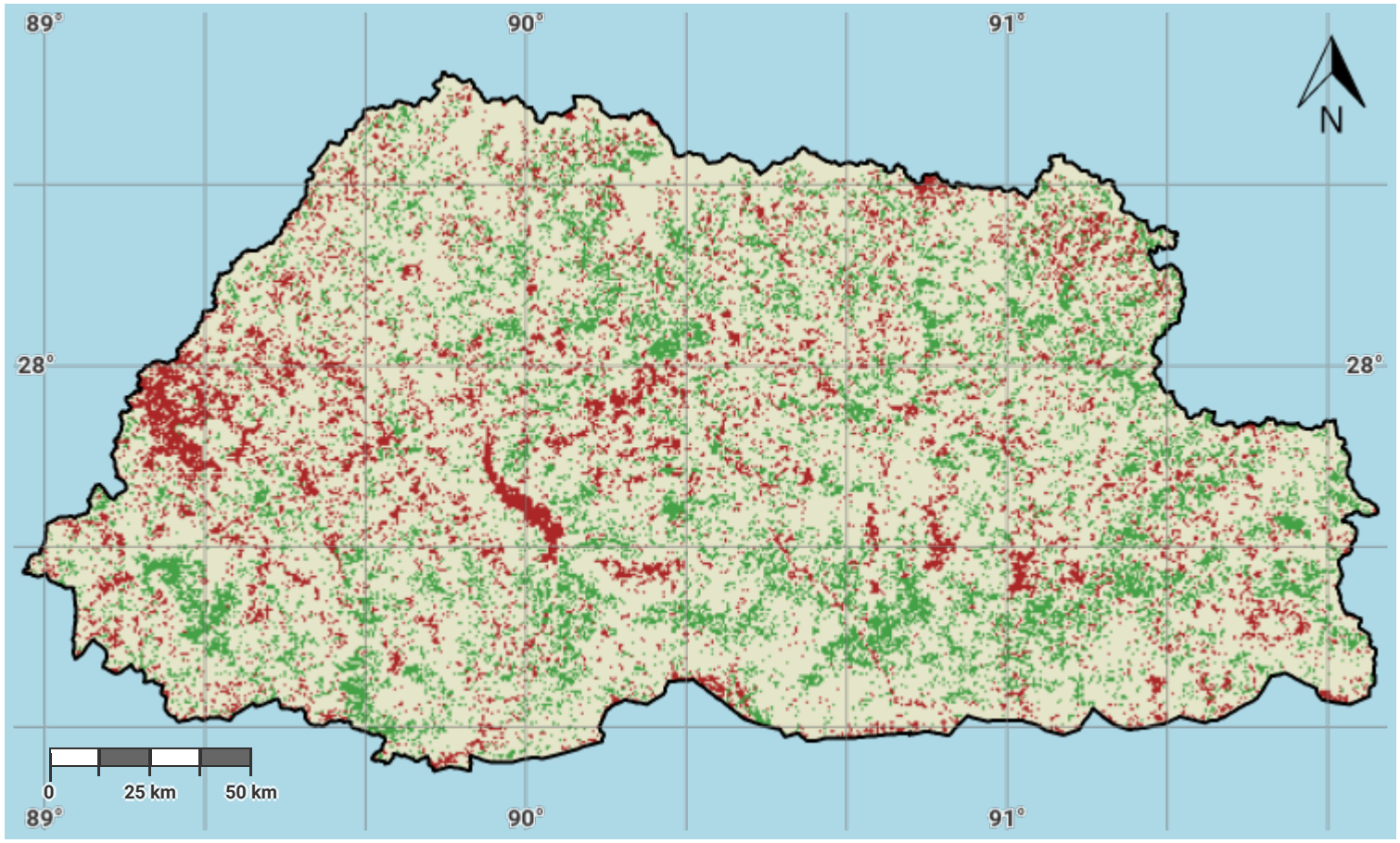
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- Land Productivity Map of Bhutan for Reporting Period 2004-2019

Bhutan – SO1-2.M3

Land productivity degradation in the baseline period



Legend

- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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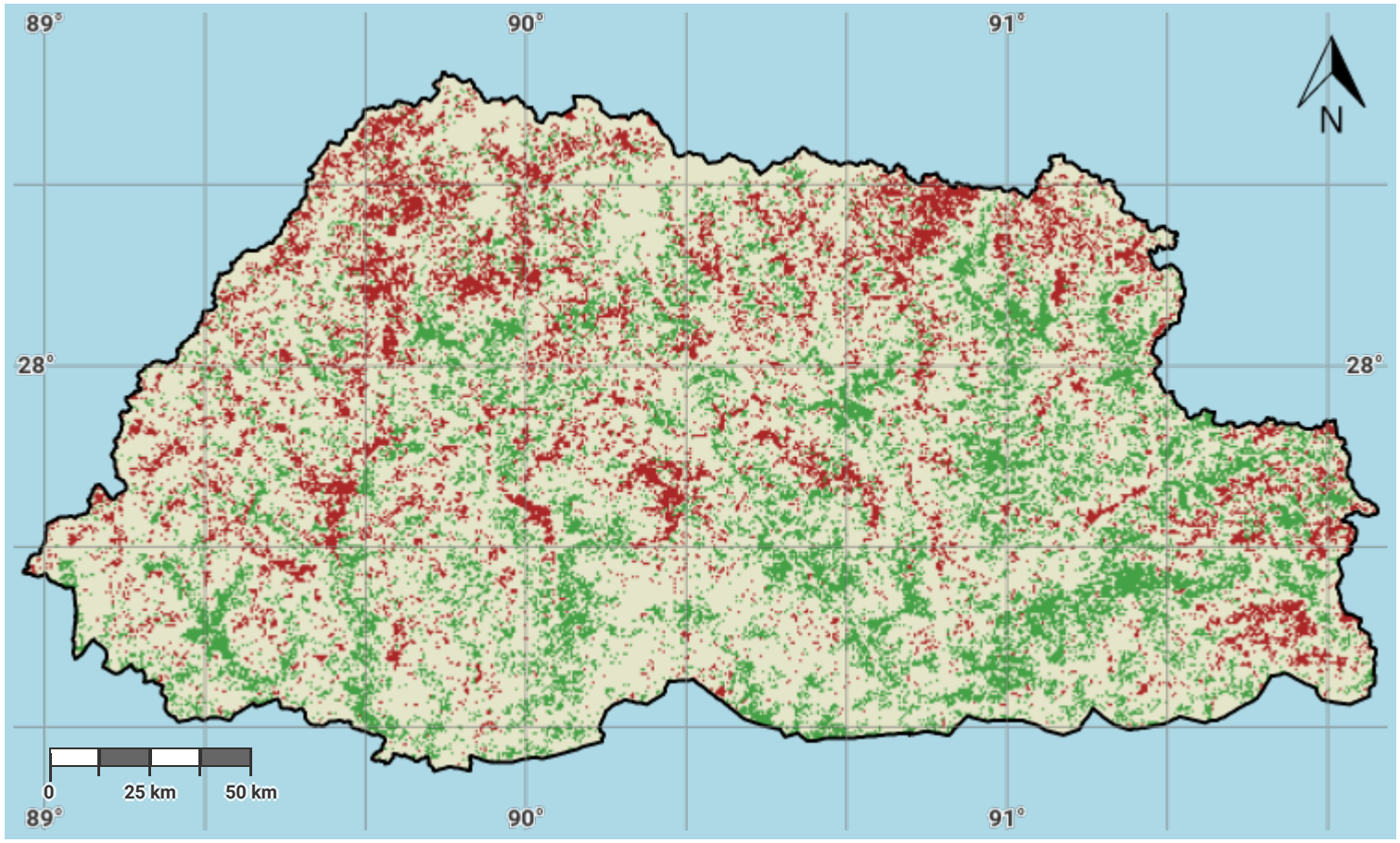
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Land degradation Map of Bhutan based on Land Productivity Dynamics Map for Baseline Period 2001-2015

Bhutan – SO1-2.M4

Land productivity degradation in the reporting period



Legend

- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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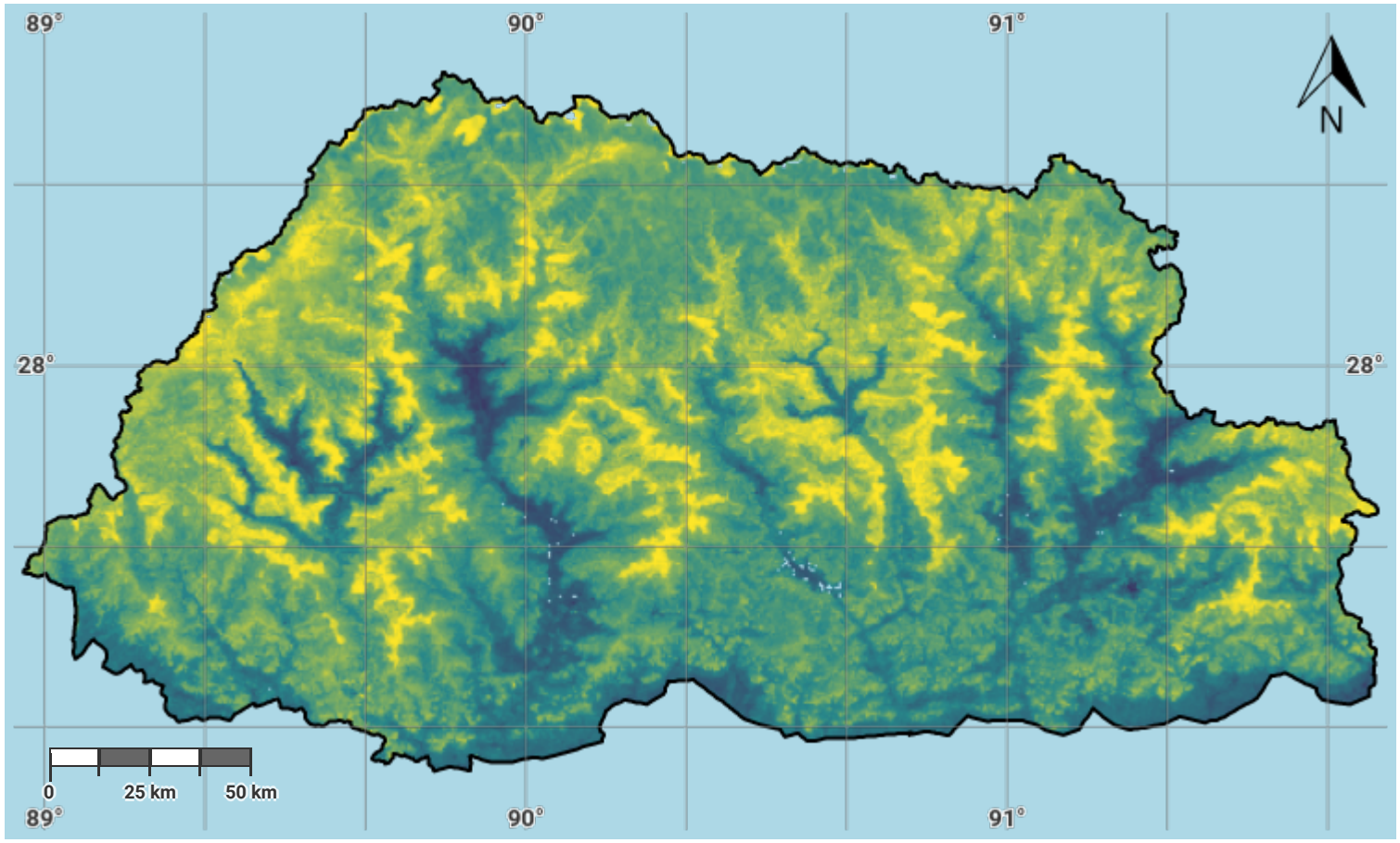
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Land degradation Map of Bhutan based on Land Productivity Dynamics Map for Reporting Period 2004-2019

Bhutan – SO1-3.M3

Soil organic carbon stock in the latest reporting year



Legend

- No data
- 0 - 71.0 t/ha
- 71.0 - 142.0 t/ha
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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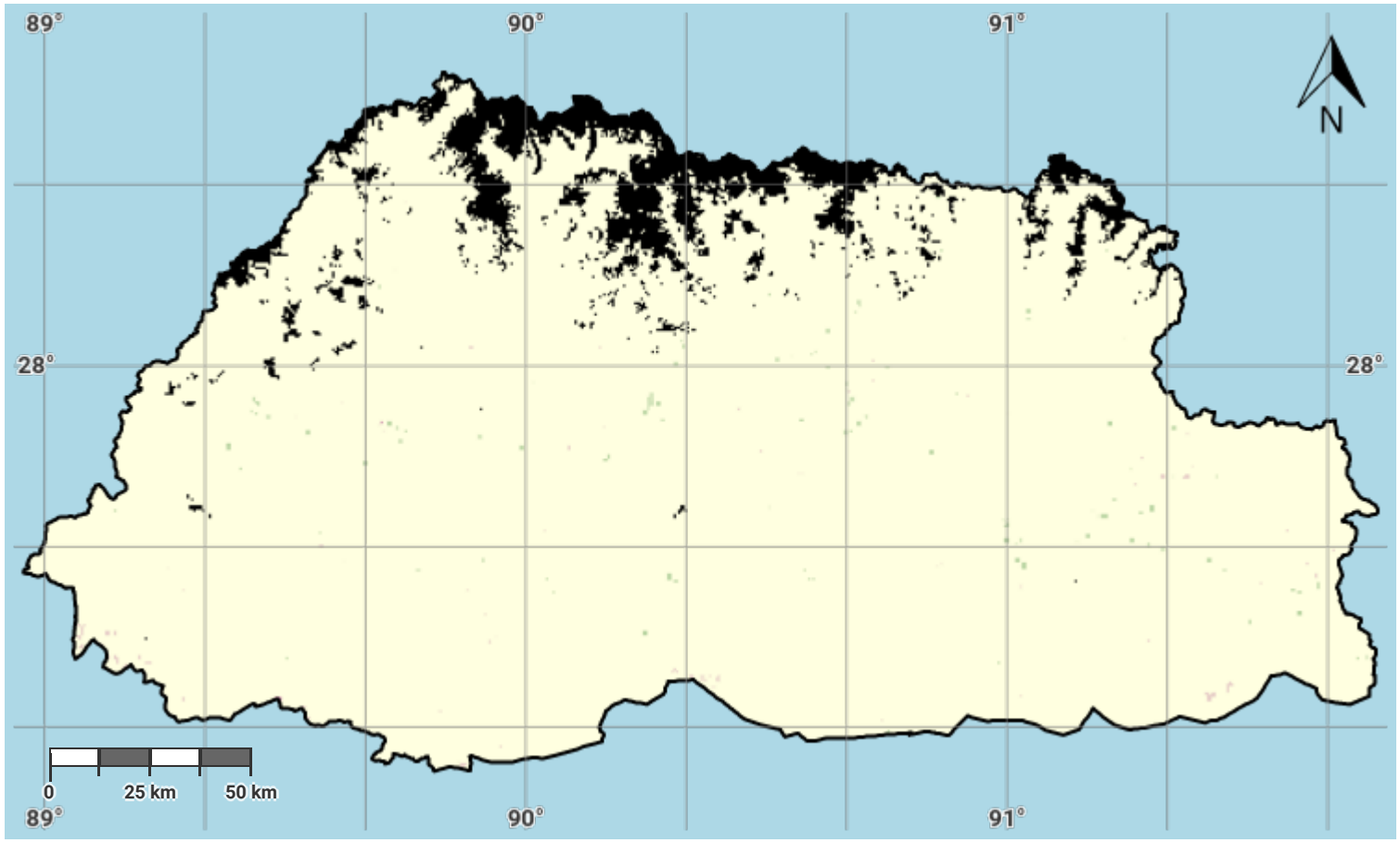
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Royal Government of Bhutan, National SOC Map 2022. Website: www.nssc.gov.bt

Bhutan – SO1-3.M4

Change in soil organic carbon stock in the baseline period



Legend

- No data
- -65.0 - 0 t/ha
- 0 - 65.0 t/ha
- International Boundary

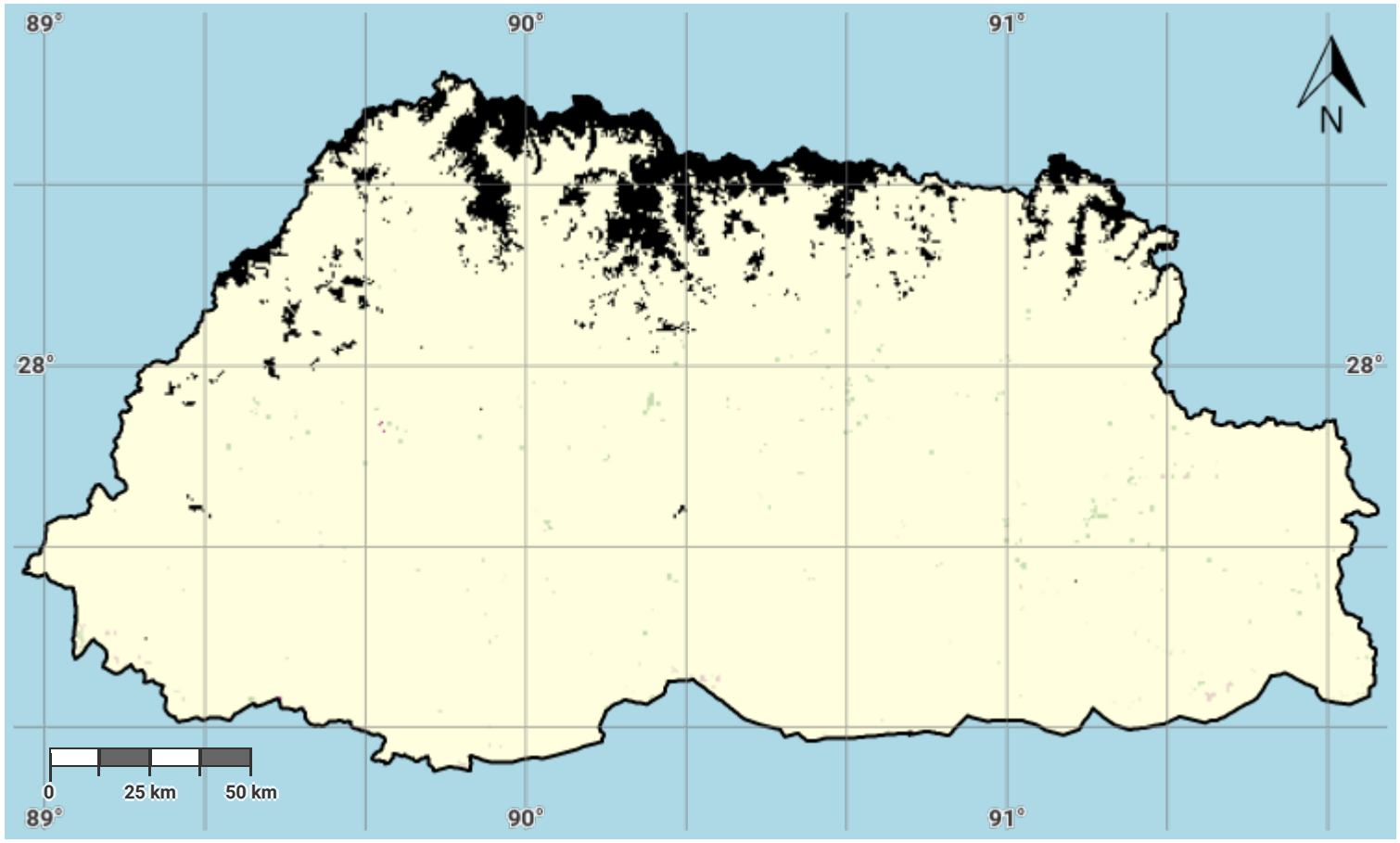
Projection: EPSG:3857 (Web Mercator)

Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- International Soil Reference and Information Centre (ISRIC) SoilGrids250m dataset. URL: https://www.isric.org/explore/soilgrids

Bhutan – SO1-3.M5

Change in soil organic carbon stock in the reporting period



Legend

- No data
- -18.0 - 0 t/ha
- 0 - 18.0 t/ha
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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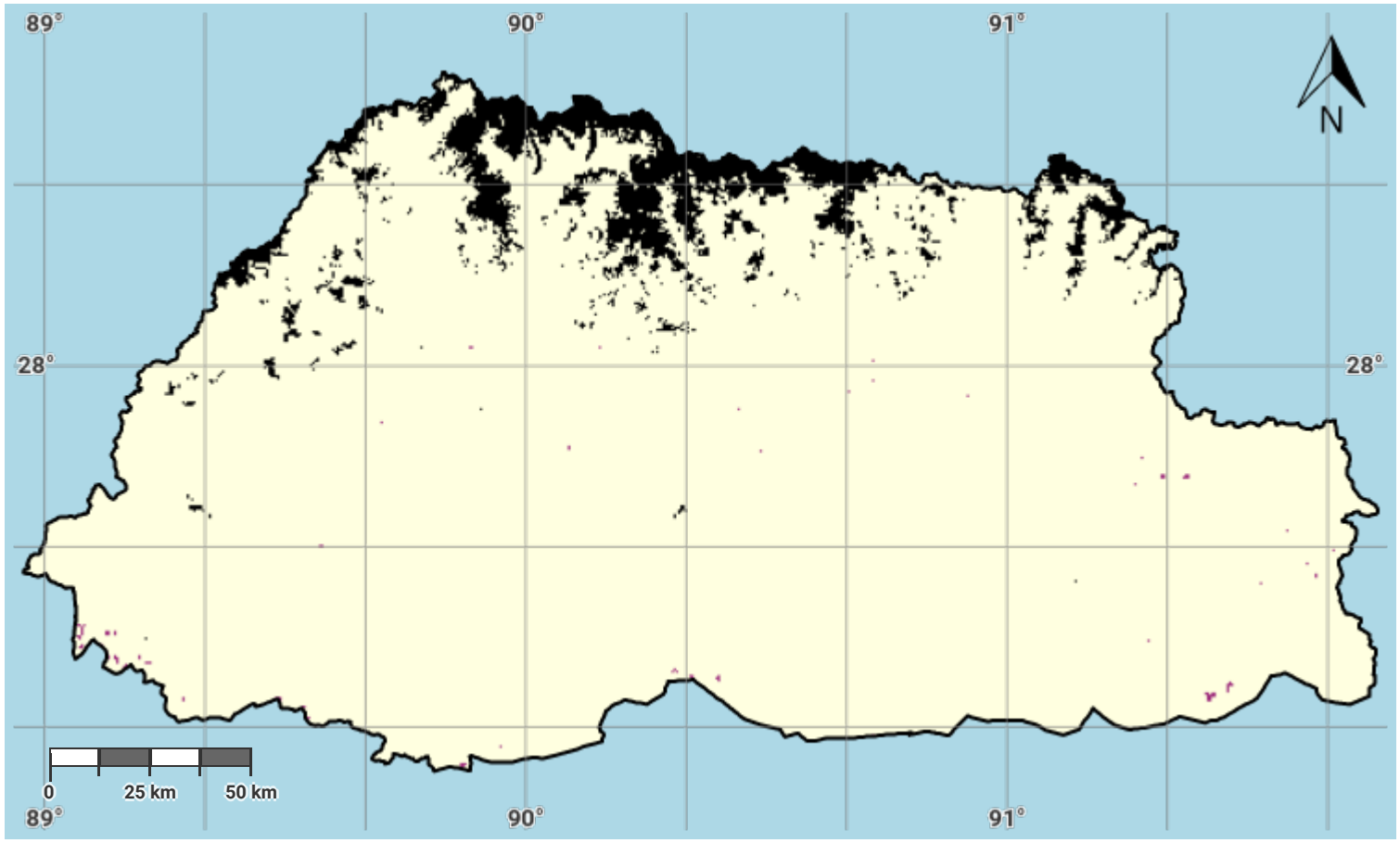
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- International Soil Reference and Information Centre (ISRIC) SoilGrids250m dataset. URL: https://www.isric.org/explore/soilgrids

Bhutan – SO1-3.M6

Soil organic carbon degradation in the baseline period



Legend

- No data
- Degradation
- Not degraded
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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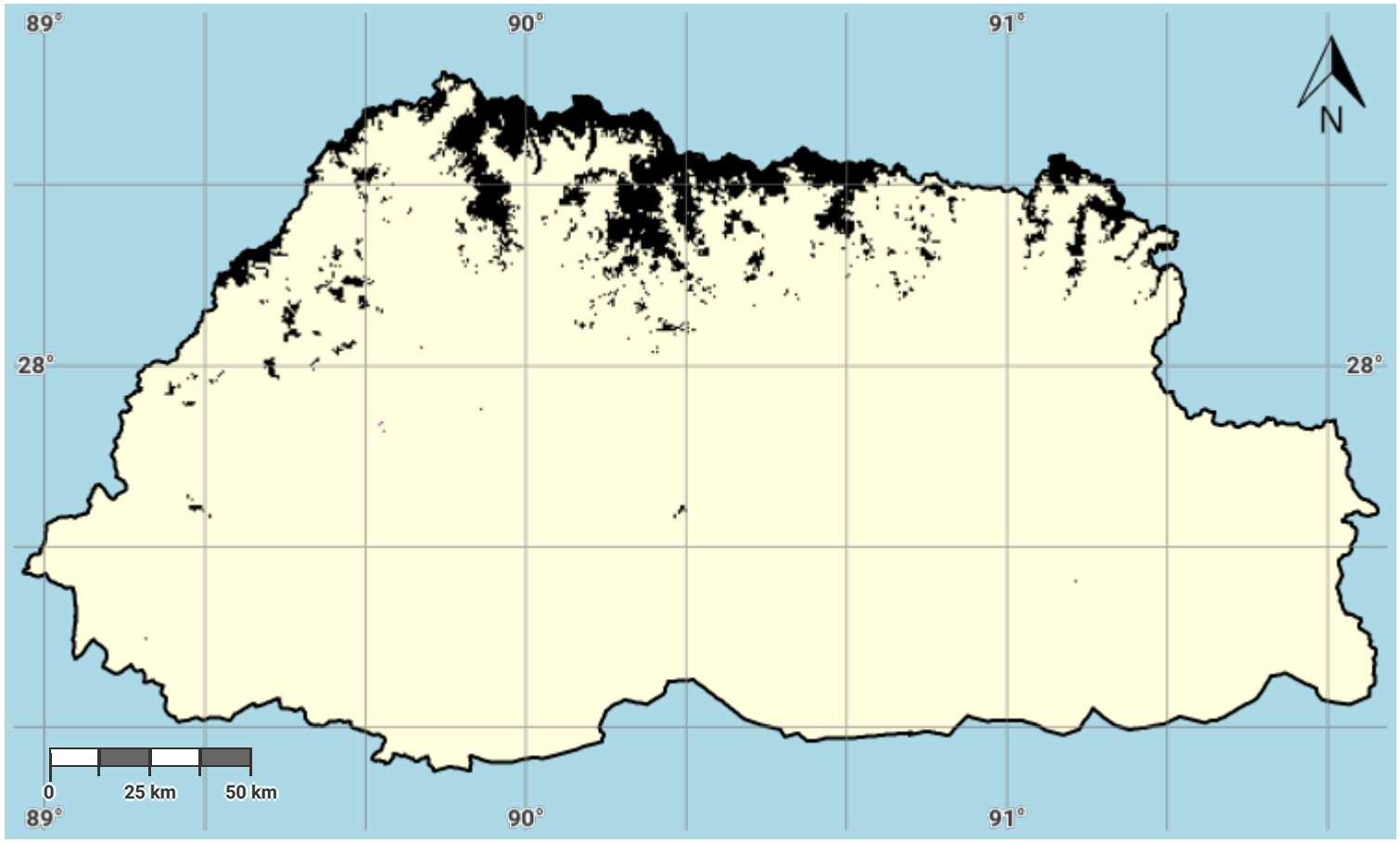
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- International Soil Reference and Information Centre (ISRIC) SoilGrids250m dataset. URL: https://www.isric.org/explore/soilgrids

Bhutan – SO1-3.M7

Soil organic carbon degradation in the reporting period



Legend

- No data
- Degradation
- Stable
- Improvement
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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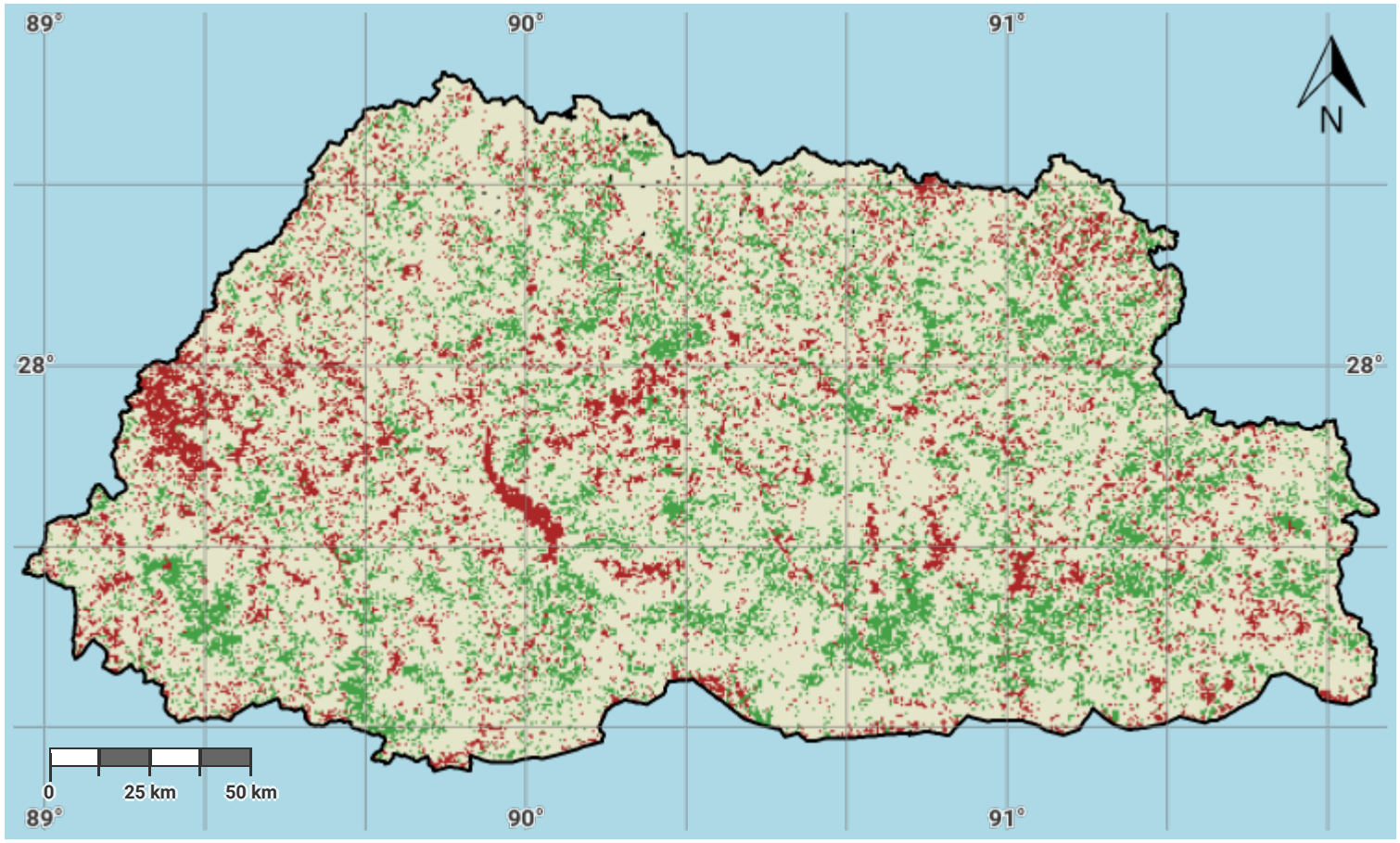
- International Soil Reference and Information Centre (ISRIC) SoilGrids250m dataset. URL: https://www.isric.org/explore/soilgrids

Bhutan – SO1-4.M1

Proportion of land that is degraded over total land area (SDG Indicator 15.3.1) in the baseline period



Legend

- No data
- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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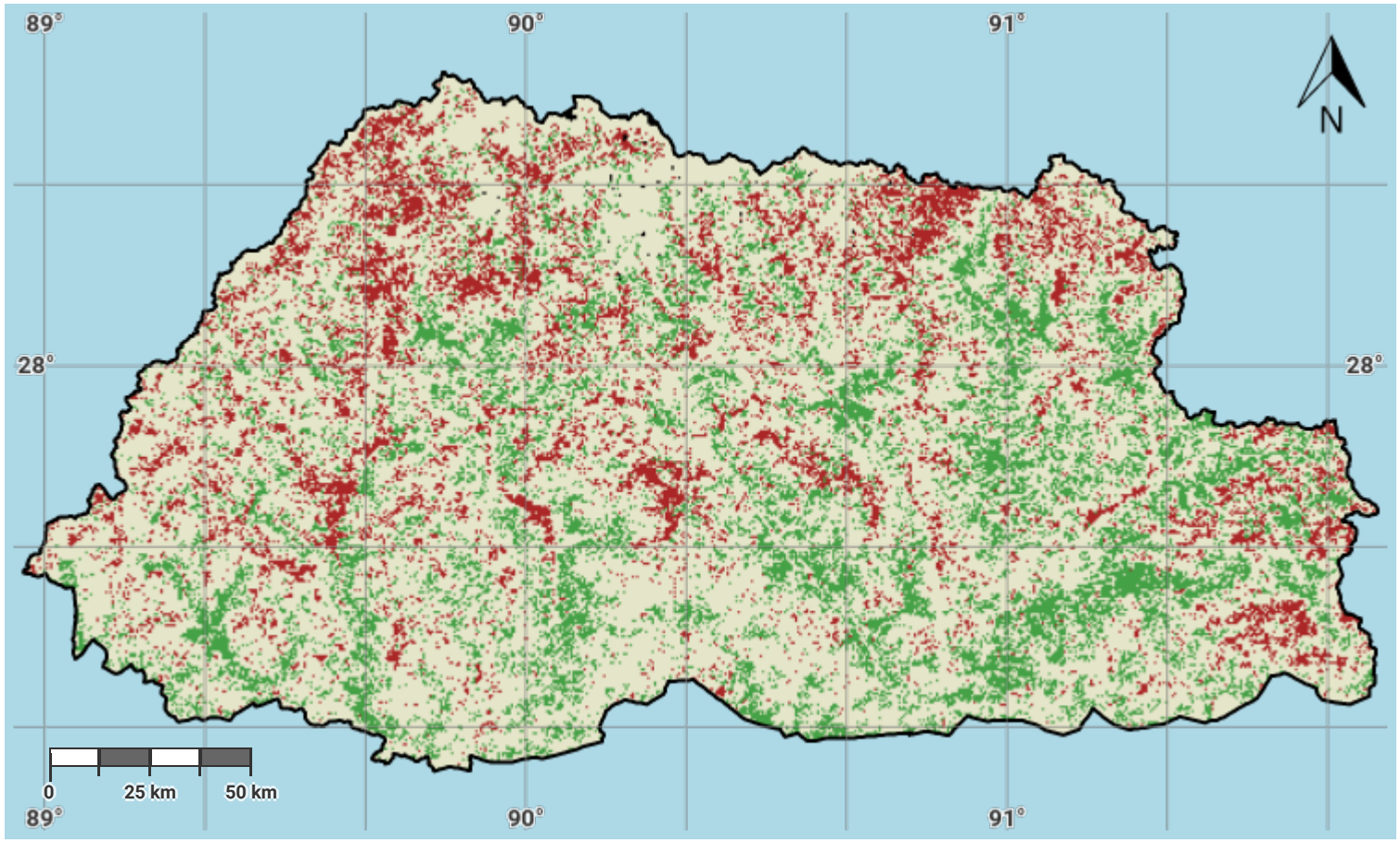
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Royal Government of Bhutan, SDG 15.3.1 Baseline Map

Bhutan – SO1-4.M2

Proportion of land that is degraded over total land area (SDG Indicator 15.3.1) in the reporting period



Legend

- No data
- Degraded
- Stable
- Improving
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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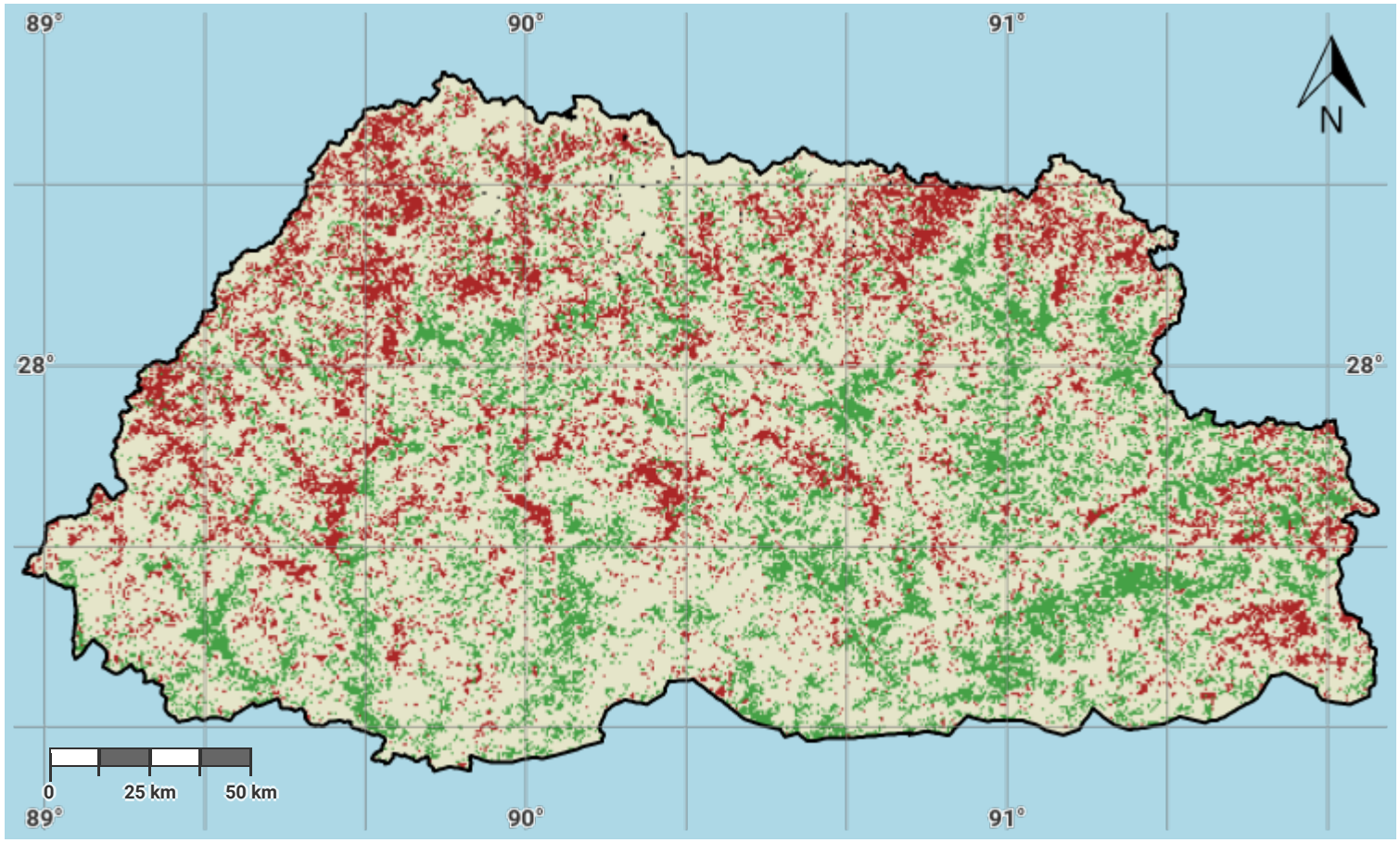
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Royal Government of Bhutan, SDG 15.3.1 Reporting Map 2015-2019

Bhutan – SO1-4.M3

Progress towards Land Degradation Neutrality (LDN) in the reporting period



Projection: EPSG:3857 (Web Mercator)

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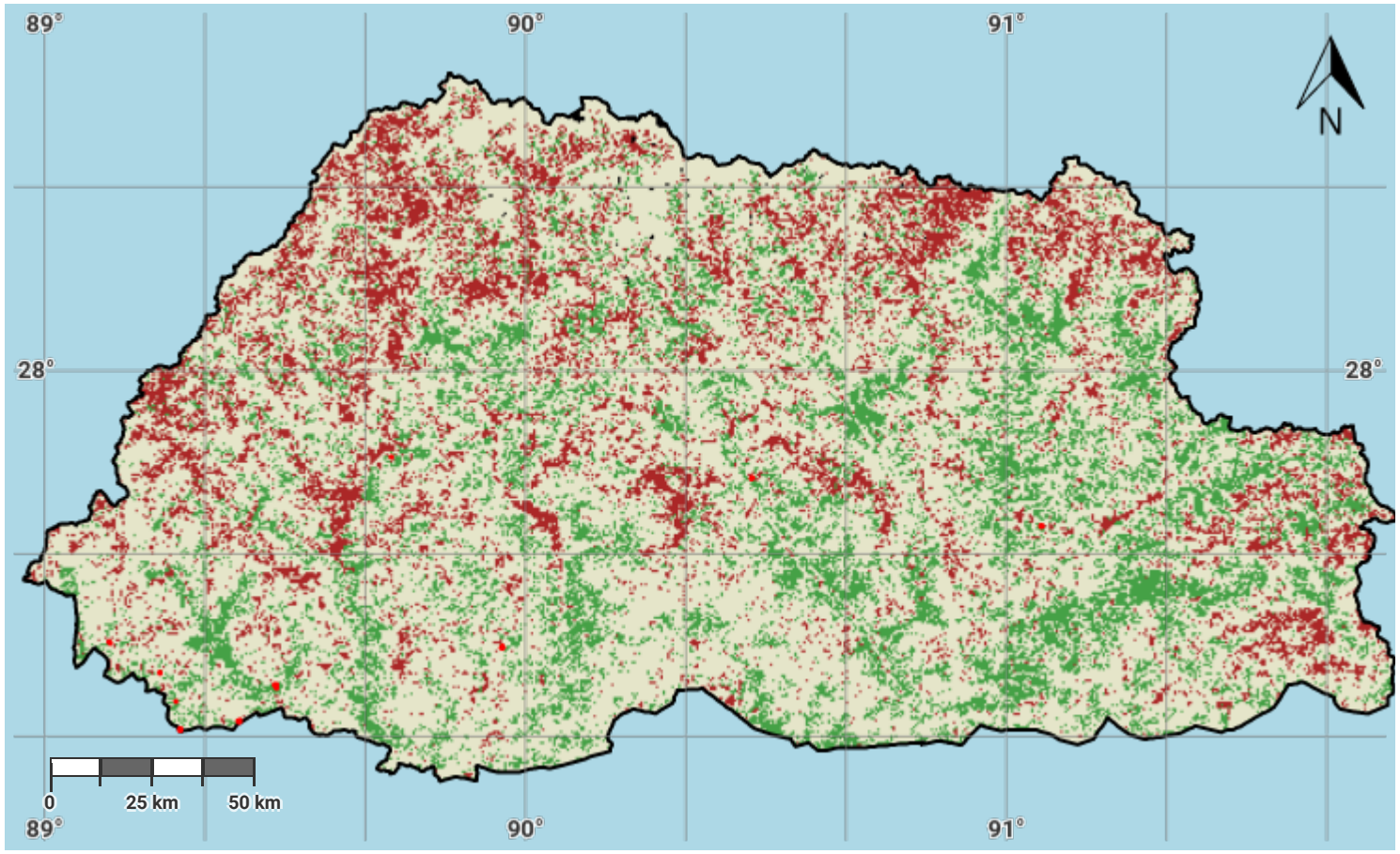
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Royal Government of Bhutan, Degraded and Improved Land since 2000 Map of Bhutan.

Bhutan – SO1-4.M6
Land Improvement Brightspots



Legend

- No data
- Degraded
- Stable
- Improving
- International Boundary
- Bright spots (MultiPolygon)

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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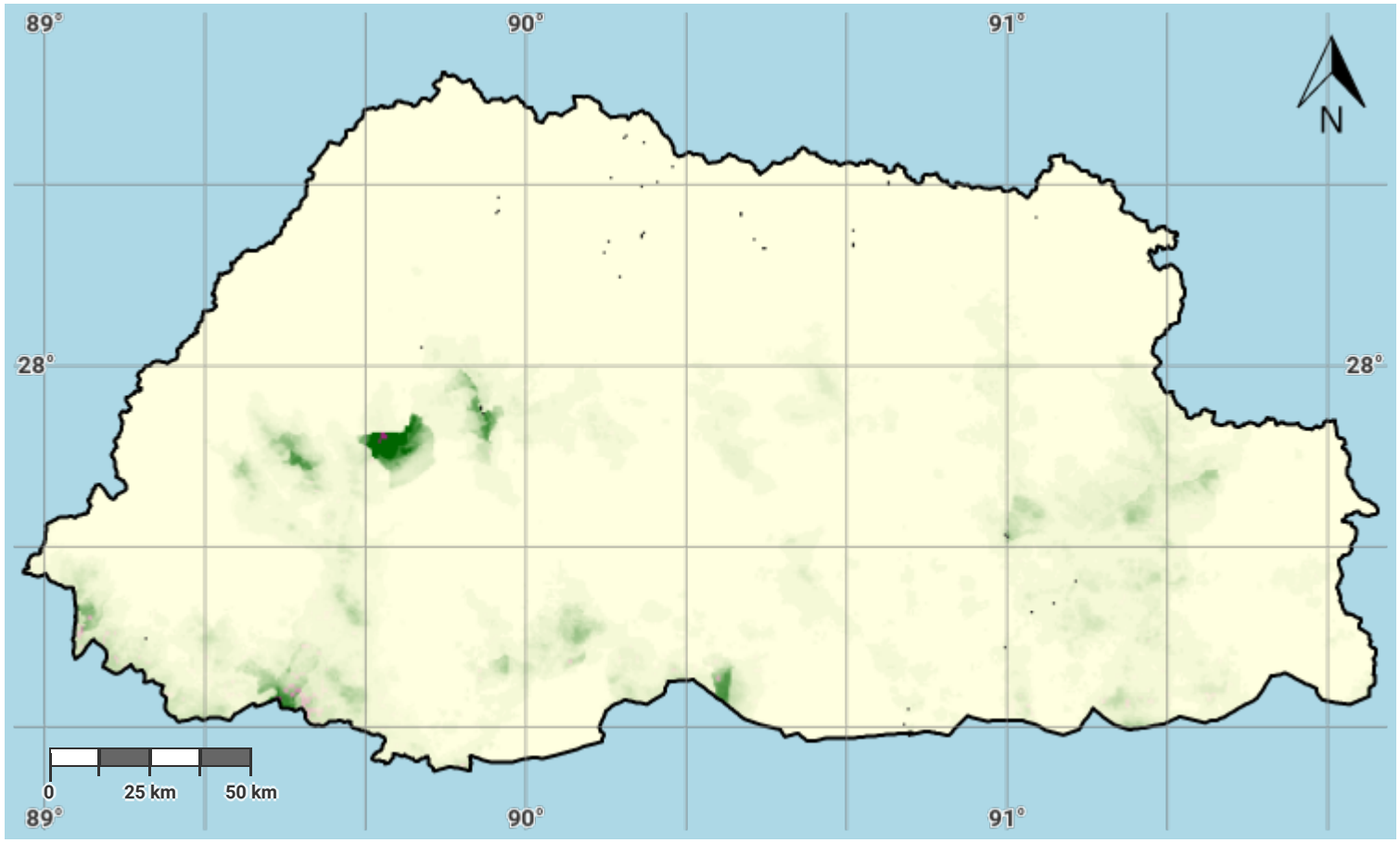
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- National Soil Services Centre, Royal Government of Bhutan, Degraded and Improved Land since 2000 Map of Bhutan.
- National Soil Services Centre, Bright spots, Bhutan

Bhutan – SO2-3.M1

Total Population exposed to land degradation (baseline)



Legend

- No data
- Population exposed to degradation (number of people, total): 0 - 540
- No land degradation
- Population not exposed to degradation (number of people, total): 0 - 540
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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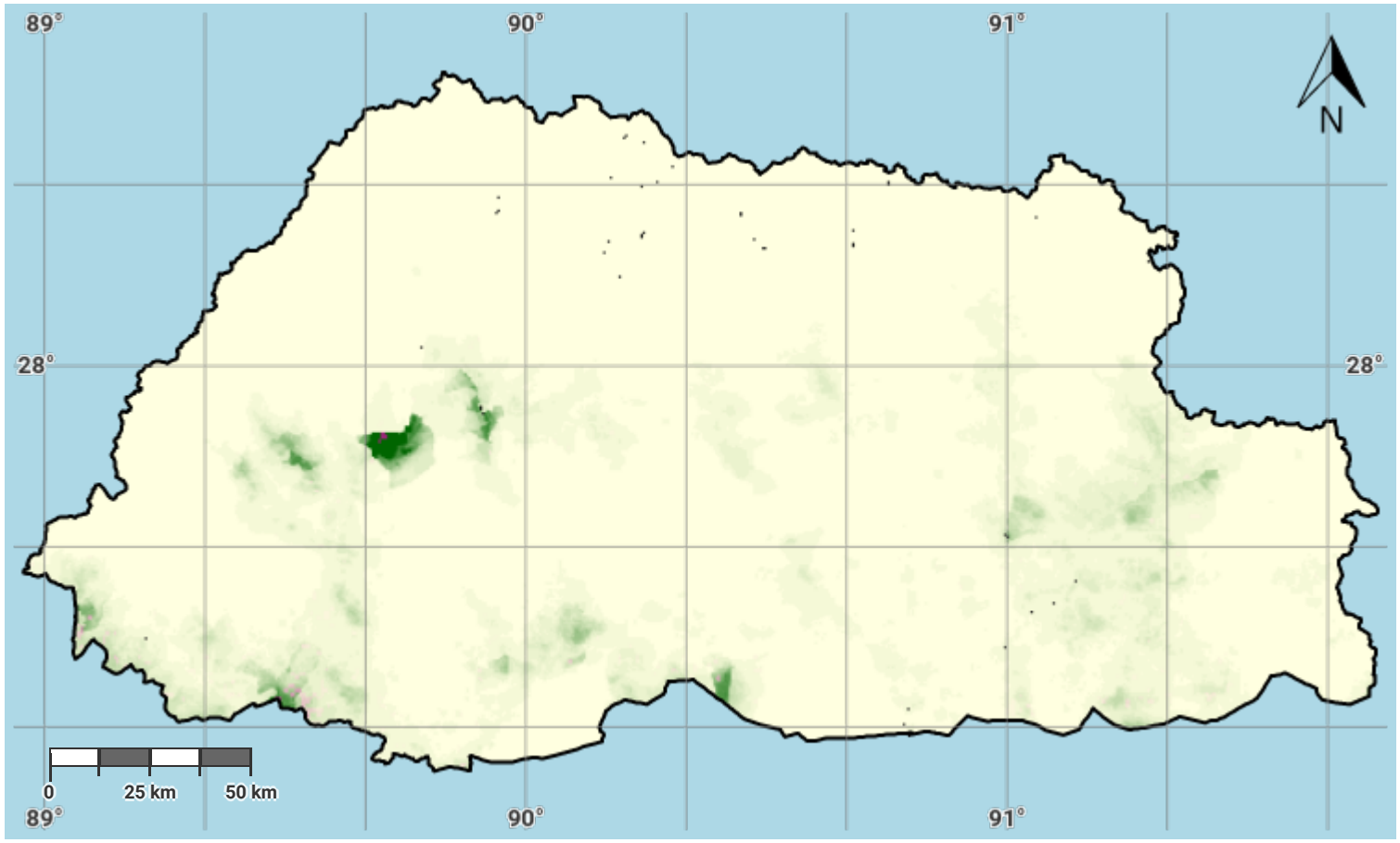
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO2-3.M2

Female Population exposed to land degradation (baseline)



Legend

- No data
- Population exposed to degradation (number of people, female): 0 - 260
- No land degradation
- Population not exposed to degradation (number of people, female): 0 - 260
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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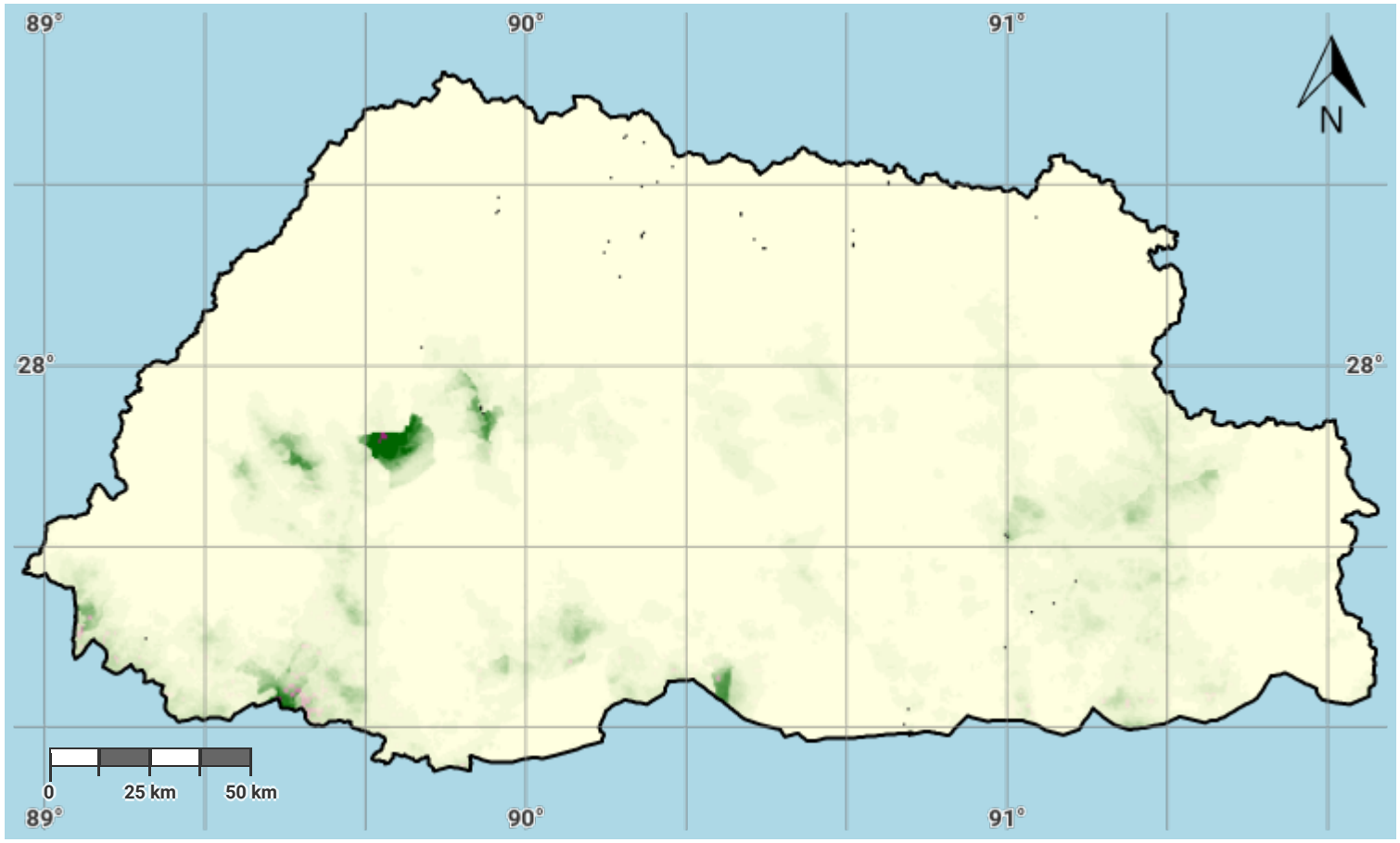
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO2-3.M3

Male Population exposed to land degradation (baseline)



Legend

- No data
- Population exposed to degradation (number of people, male): 0 - 280
- No land degradation
- Population not exposed to degradation (number of people, male): 0 - 280
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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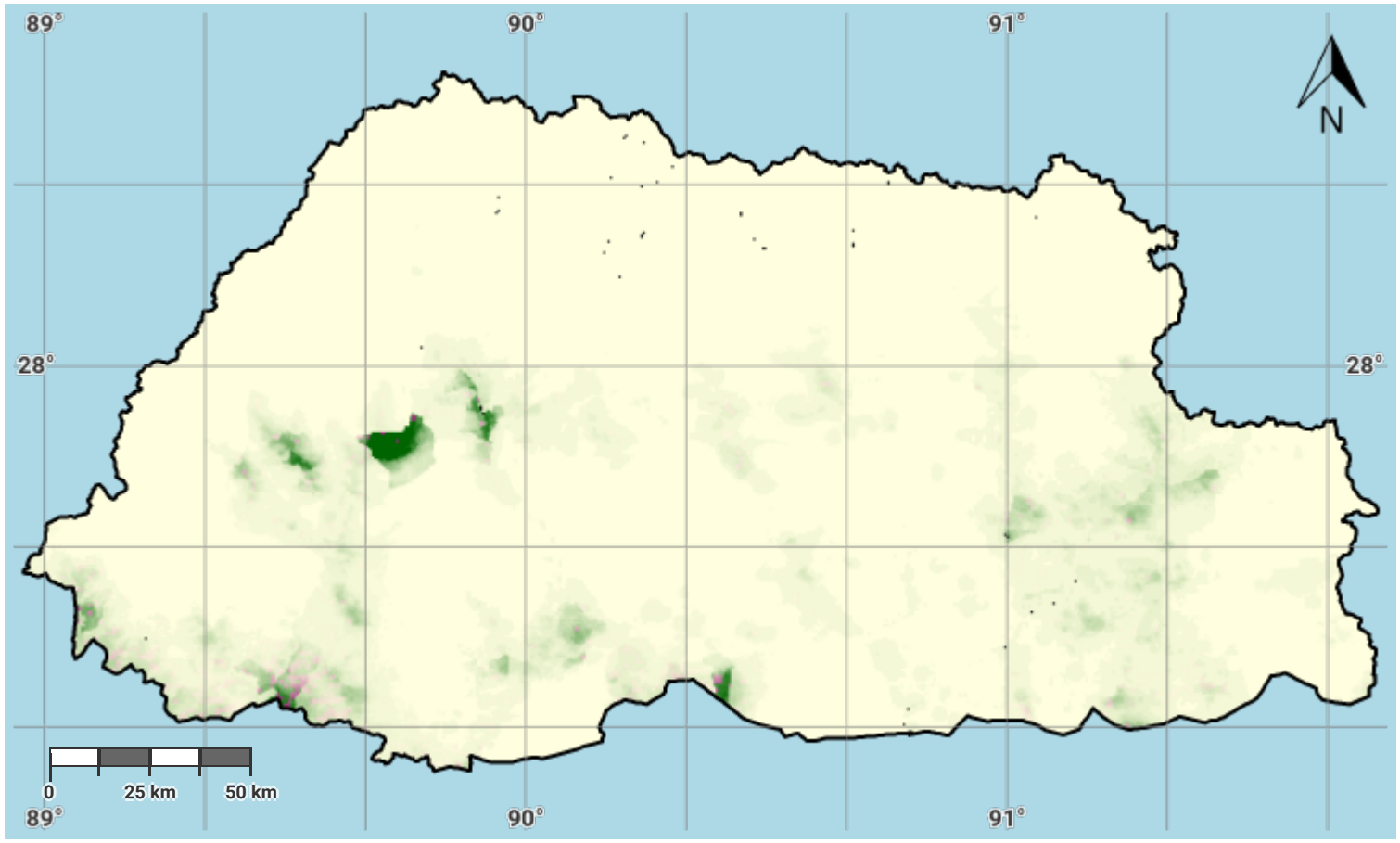
Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO2-3.M4

Total Population exposed to land degradation (reporting)



Projection: EPSG:3857 (Web Mercator)

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Source Data Credits

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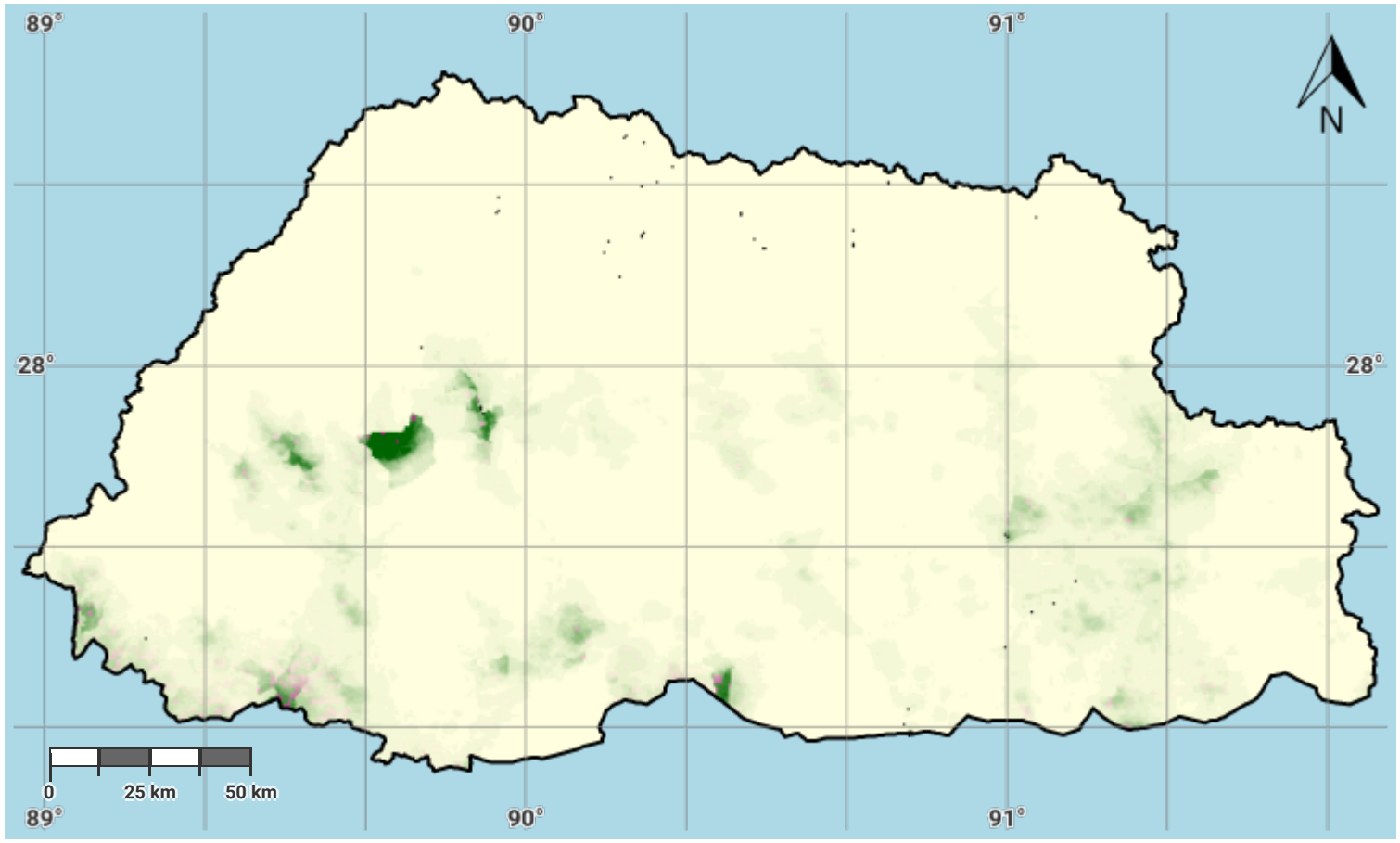
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO2-3.M5

Female Population exposed to land degradation (reporting)



Legend

- No data
- Population exposed to degradation (number of people, female): 0 - 240
- No land degradation
- Population not exposed to degradation (number of people, female): 0 - 240
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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Source Data Credits

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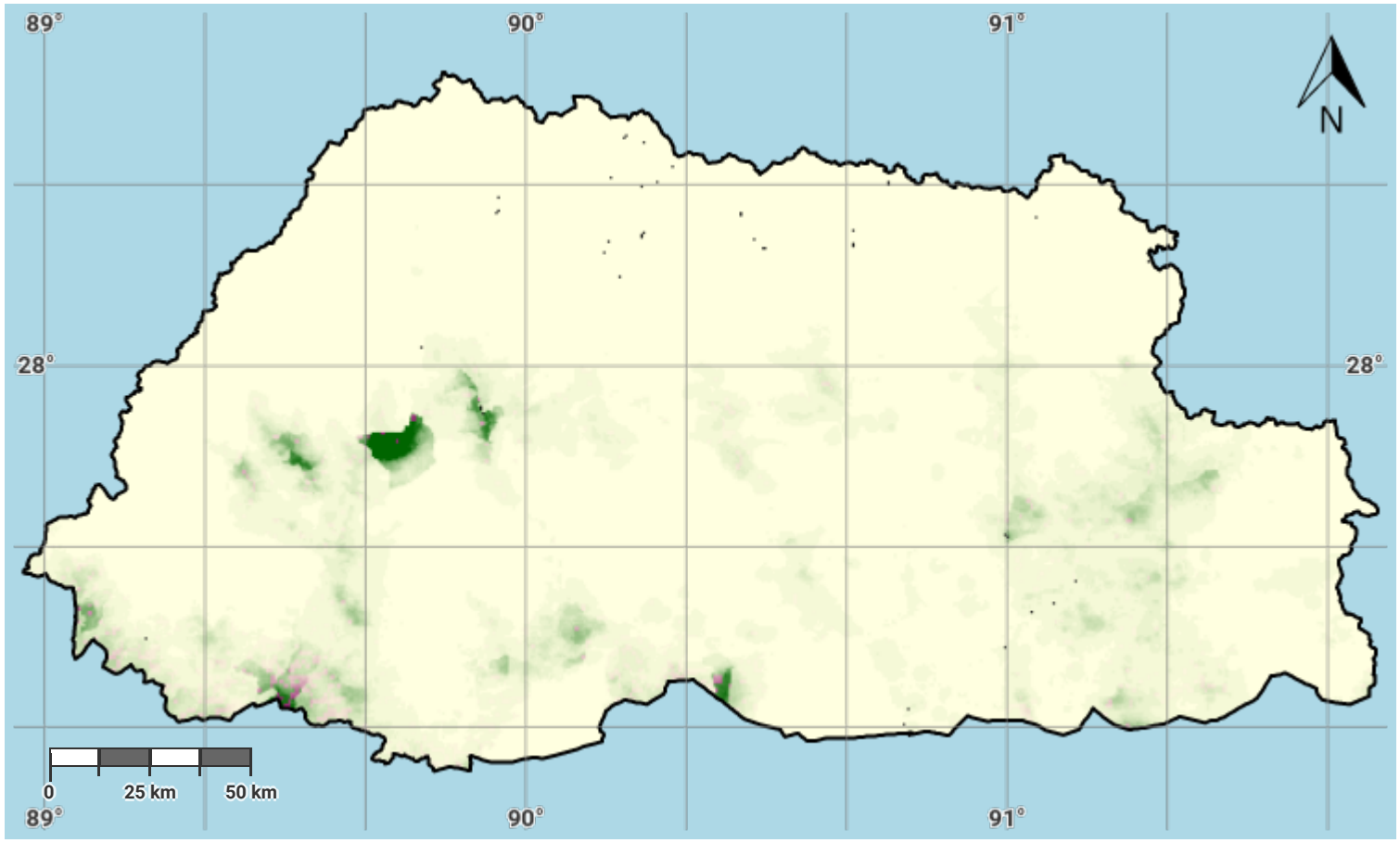
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO2-3.M6

Male Population exposed to land degradation (reporting)



Projection: EPSG:3857 (Web Mercator)

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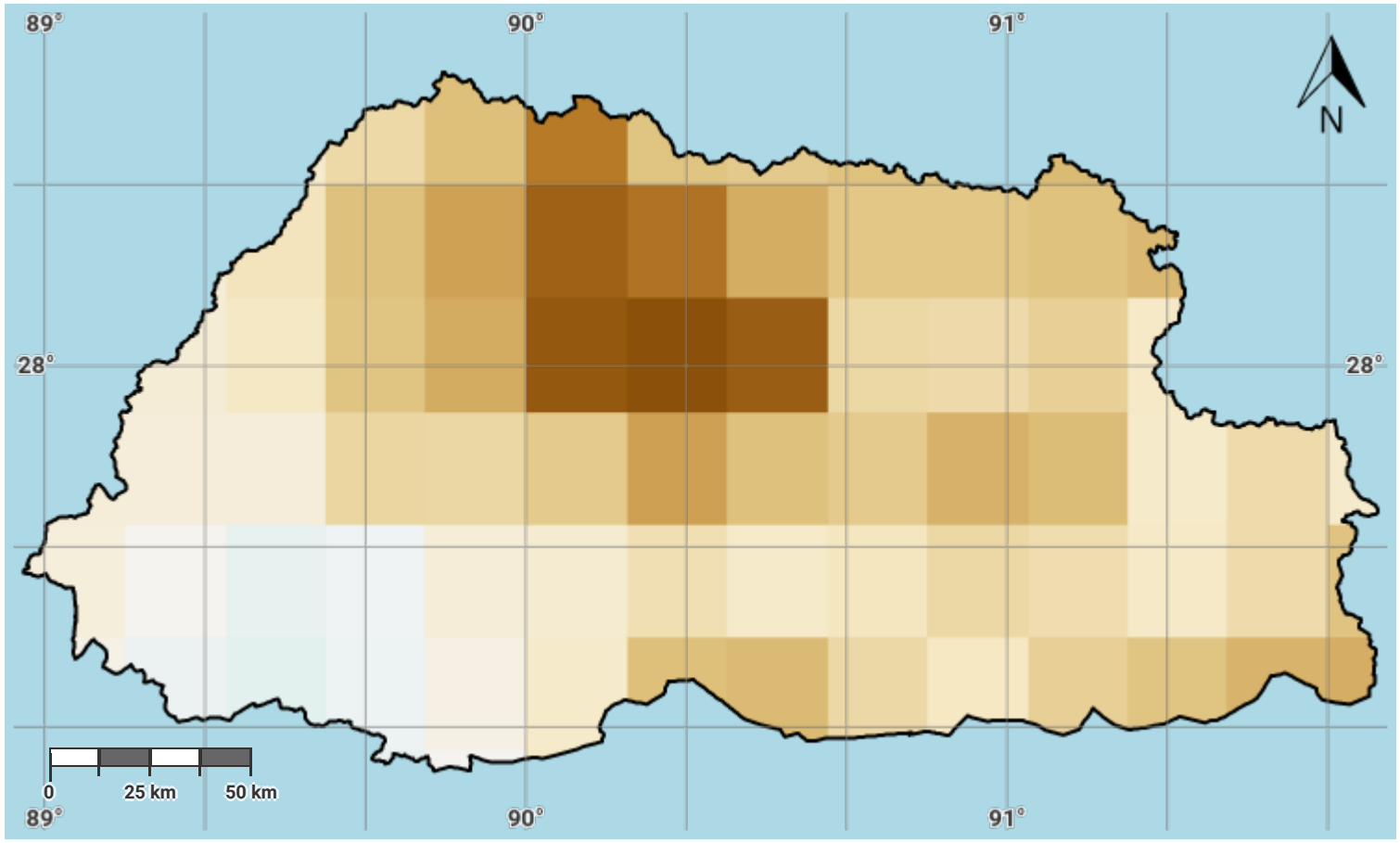
- WorldPop project URL: https://www.worldpop.org

Bhutan – SO3-1.M1

Drought hazard in first epoch of baseline period



Legend

- No data
- Extreme drought
- Severe drought
- Moderate drought
- Mild drought
- Normal
- Mildly wet
- Moderately wet
- Severely wet
- Extremely wet
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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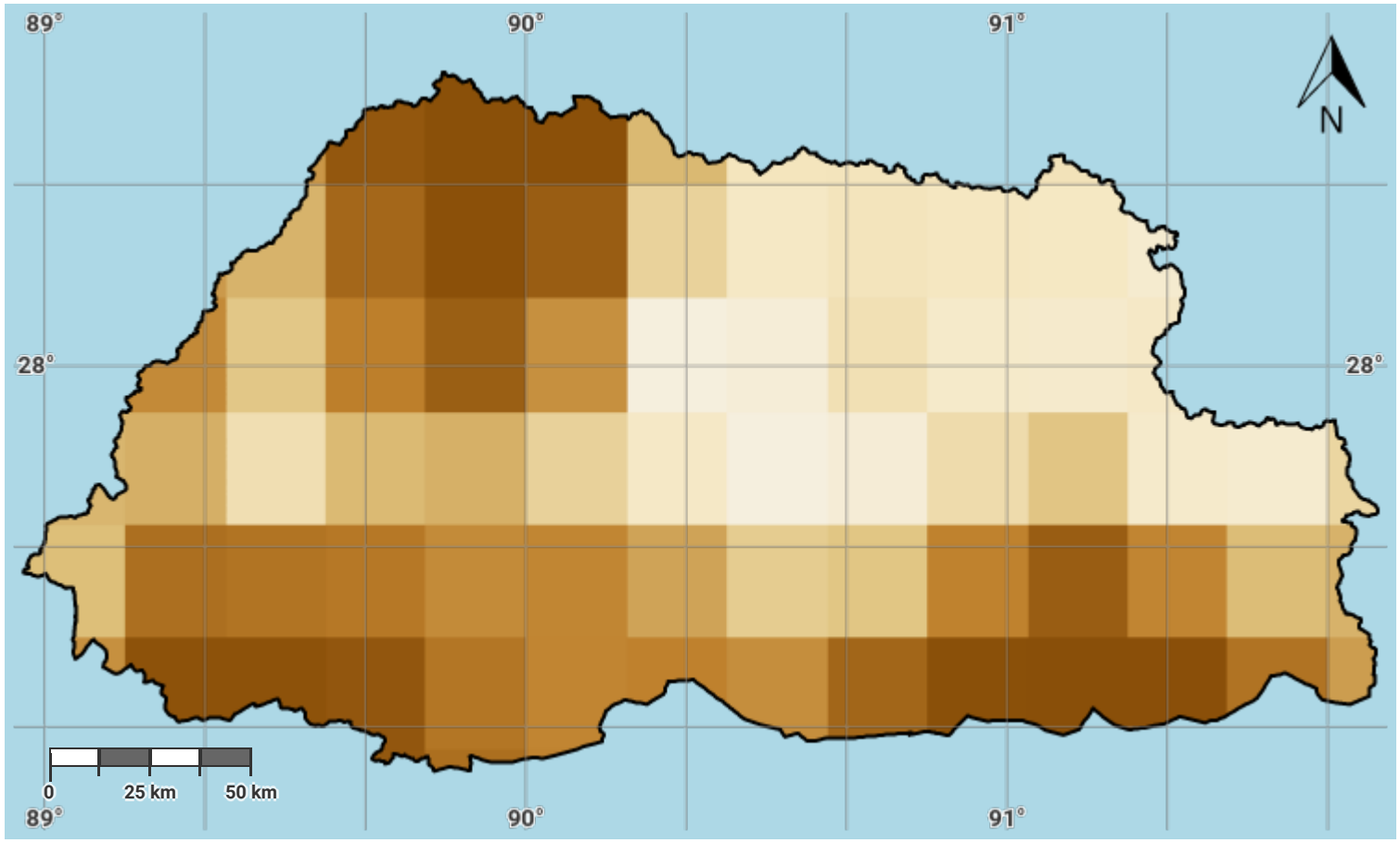
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-1.M2

Drought hazard in second epoch of baseline period



Legend

- No data
- Extreme drought
- Severe drought
- Moderate drought
- Mild drought
- Normal
- Mildly wet
- Moderately wet
- Severely wet
- Extremely wet
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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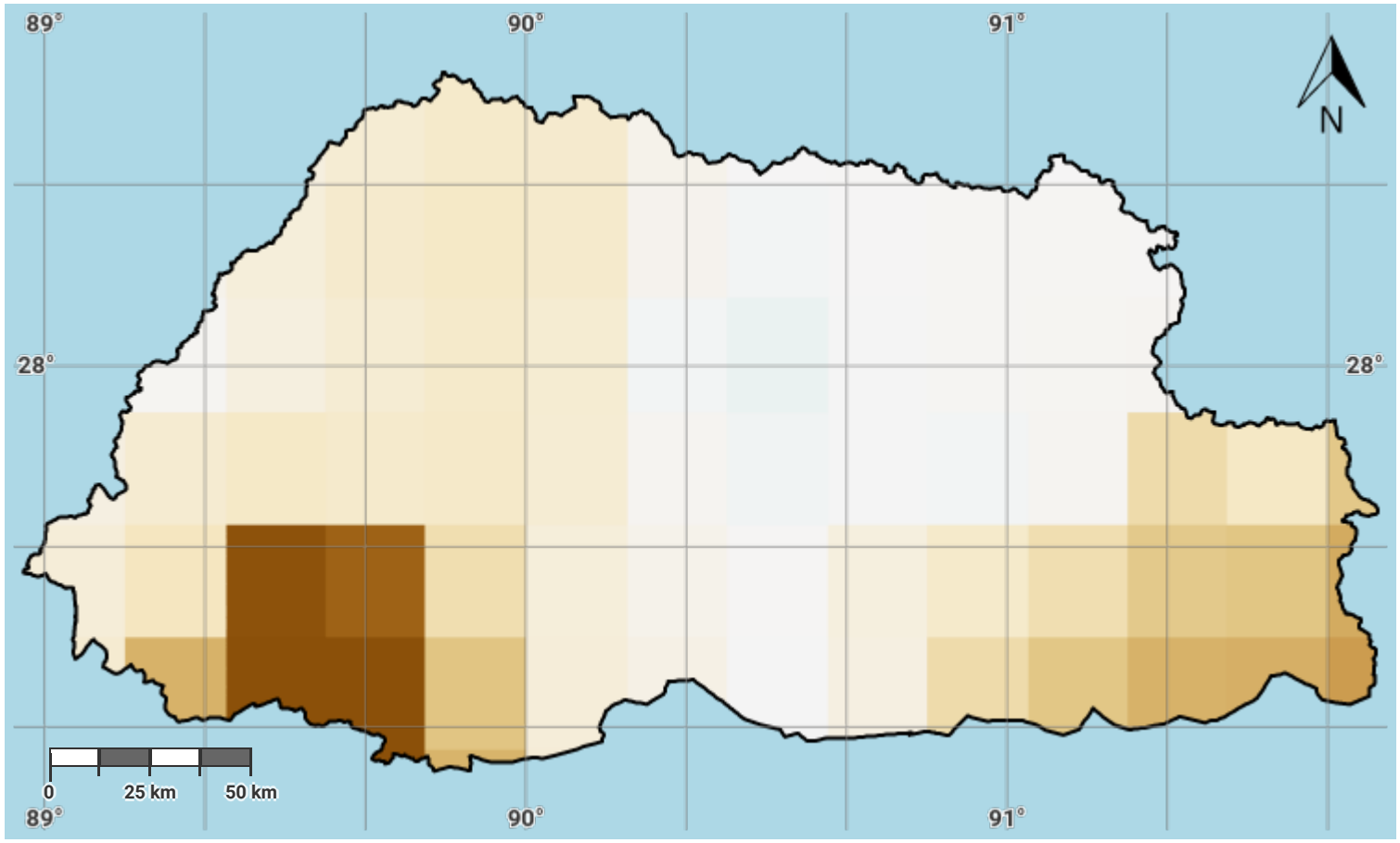
Bhutan – SO3-1.M3

Drought hazard in third epoch of baseline period



Legend

- No data
- Extreme drought
- Severe drought
- Moderate drought
- Mild drought
- Normal
- Mildly wet
- Moderately wet
- Severely wet
- Extremely wet
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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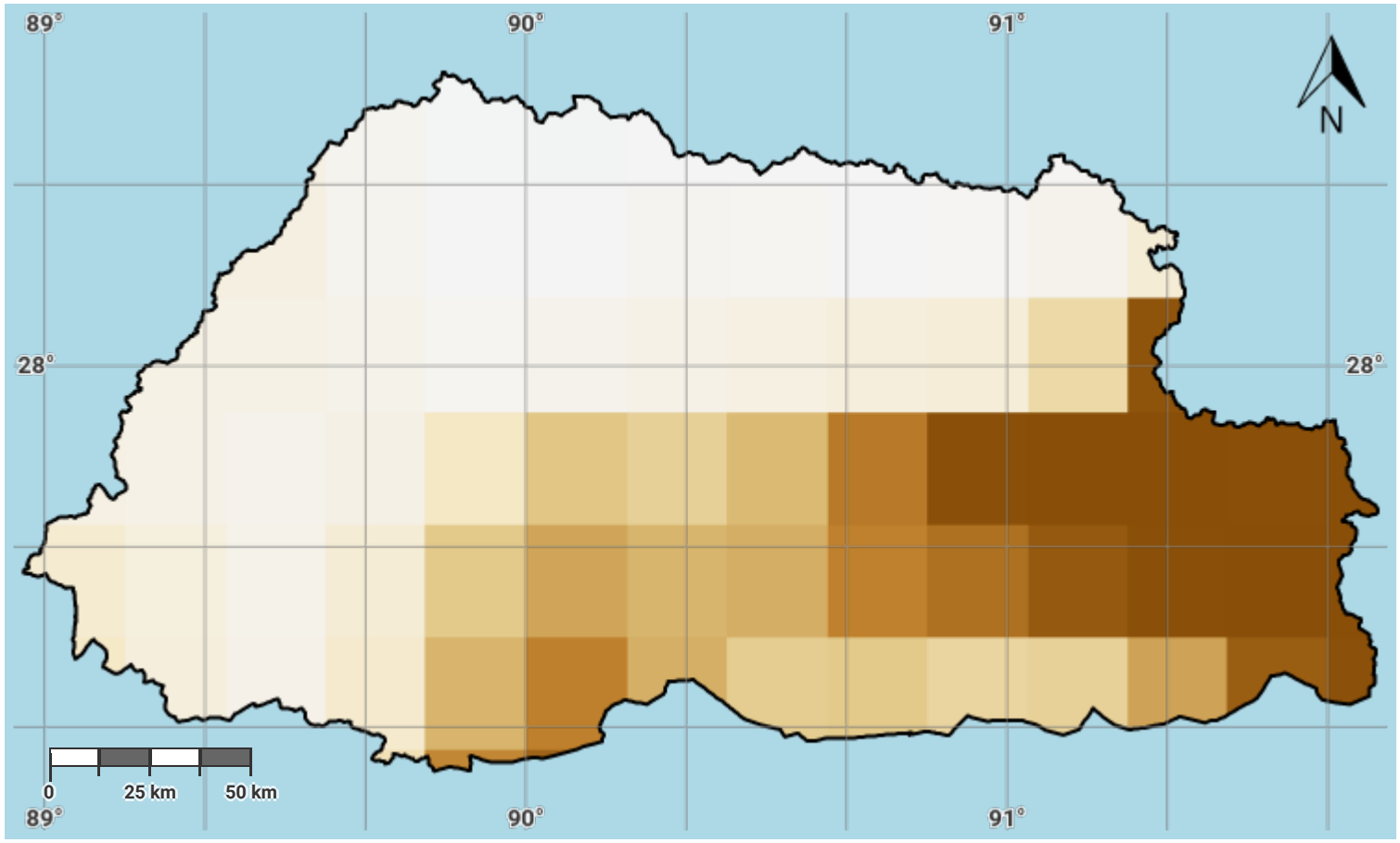
Bhutan – SO3-1.M4

Drought hazard in fourth epoch of baseline period



Legend

- No data
- Extreme drought
- Severe drought
- Moderate drought
- Mild drought
- Normal
- Mildly wet
- Moderately wet
- Severely wet
- Extremely wet
- International Boundary

Projection: EPSG:3857 (Web Mercator)

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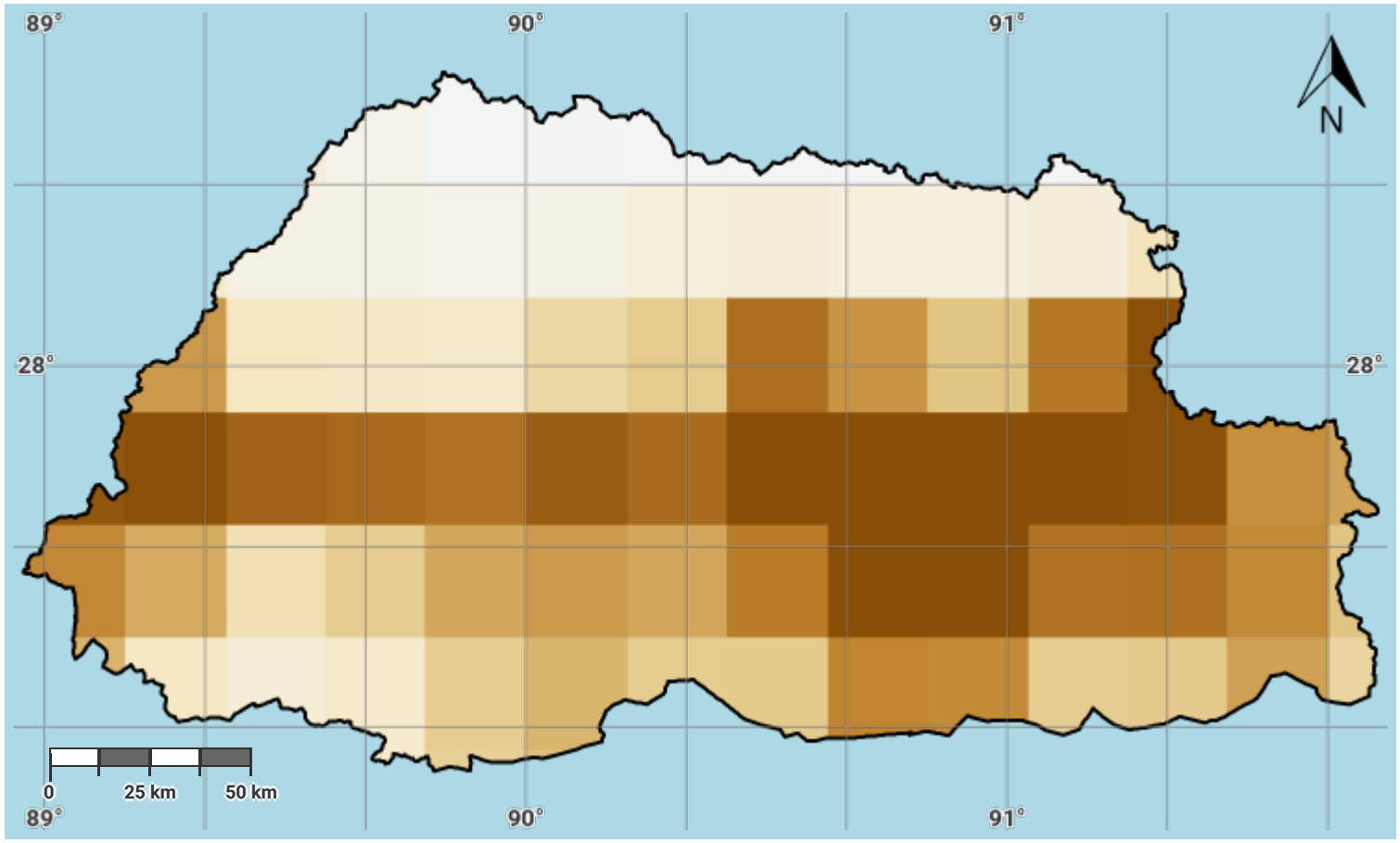
Bhutan – SO3-1.M5

Drought hazard in the reporting period



Legend

- No data
- Extreme drought
- Severe drought
- Moderate drought
- Mild drought
- Normal
- Mildly wet
- Moderately wet
- Severely wet
- Extremely wet
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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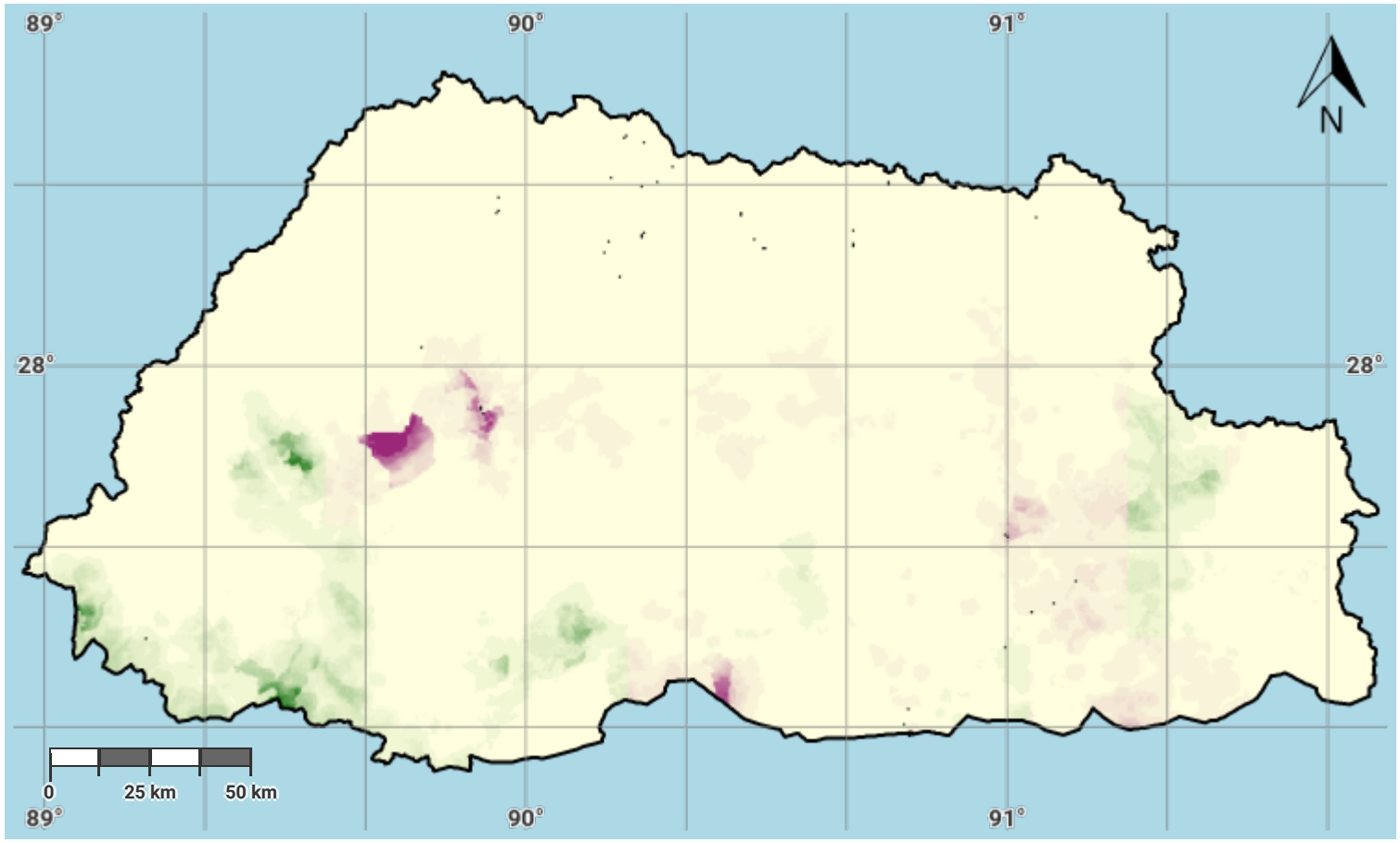
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M1

Drought exposure in first epoch of baseline period



Legend

- No data
- Population exposed to drought (number of people, total): 0 - 370
- No drought
- Population not exposed to drought (number of people, total): 0 - 370
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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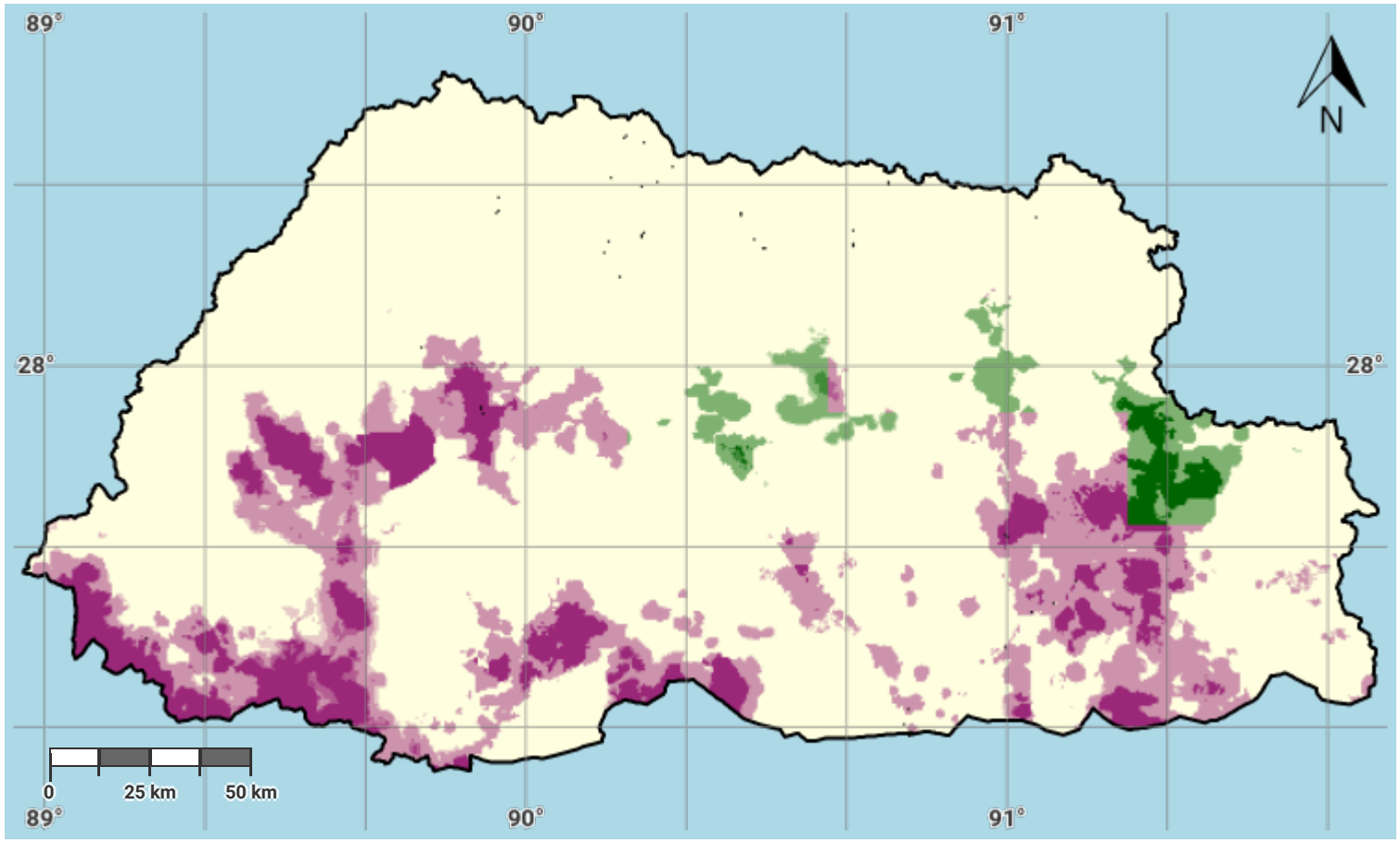
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M2

Drought exposure in second epoch of baseline period



Legend

- No data
- Population exposed to drought (number of people, total): 0 - 40
- No drought
- Population not exposed to drought (number of people, total): 0 - 40
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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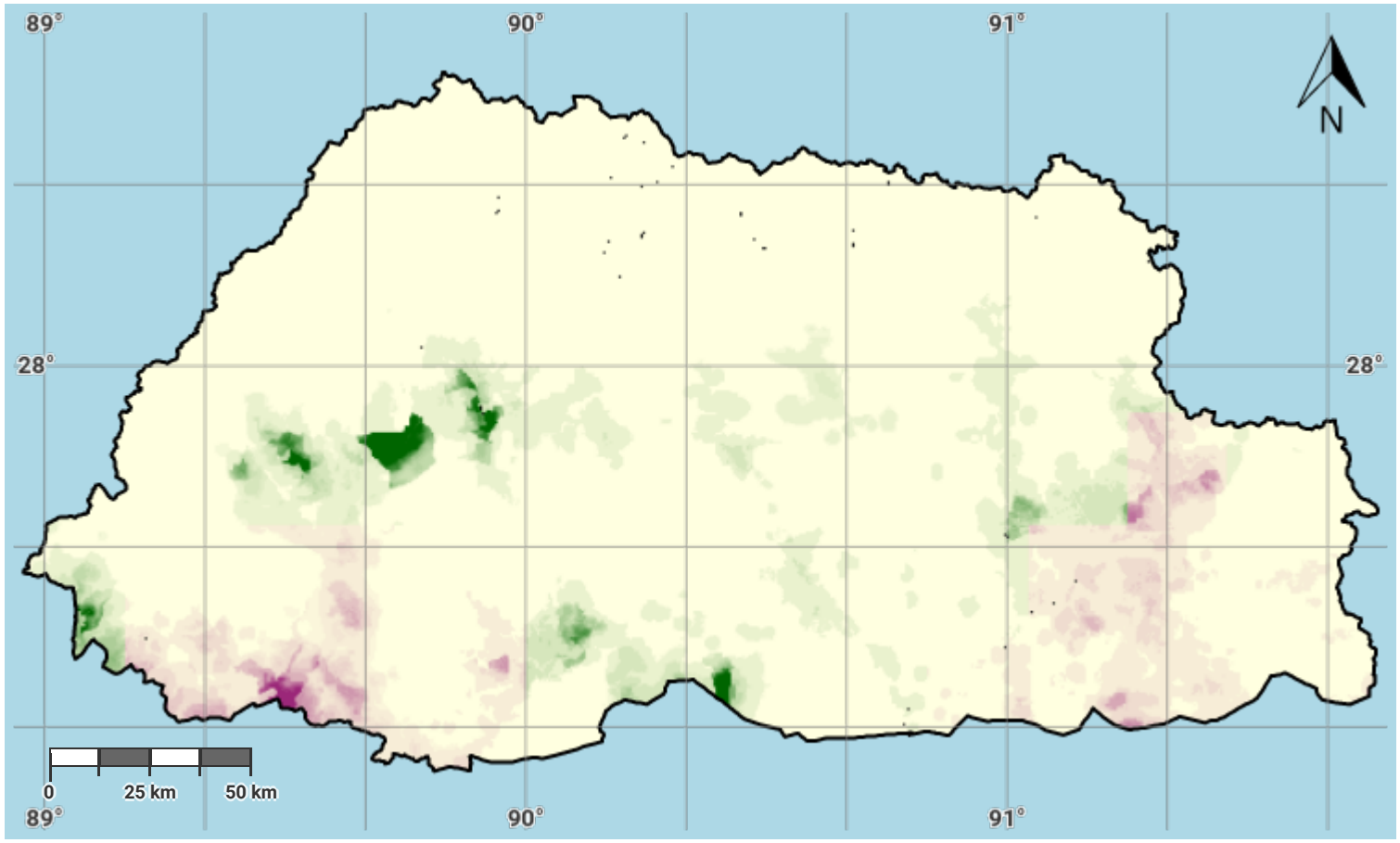
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M3

Drought exposure in third epoch of baseline period



Legend

- No data
- Population exposed to drought (number of people, total): 0 - 250
- No drought
- Population not exposed to drought (number of people, total): 0 - 250
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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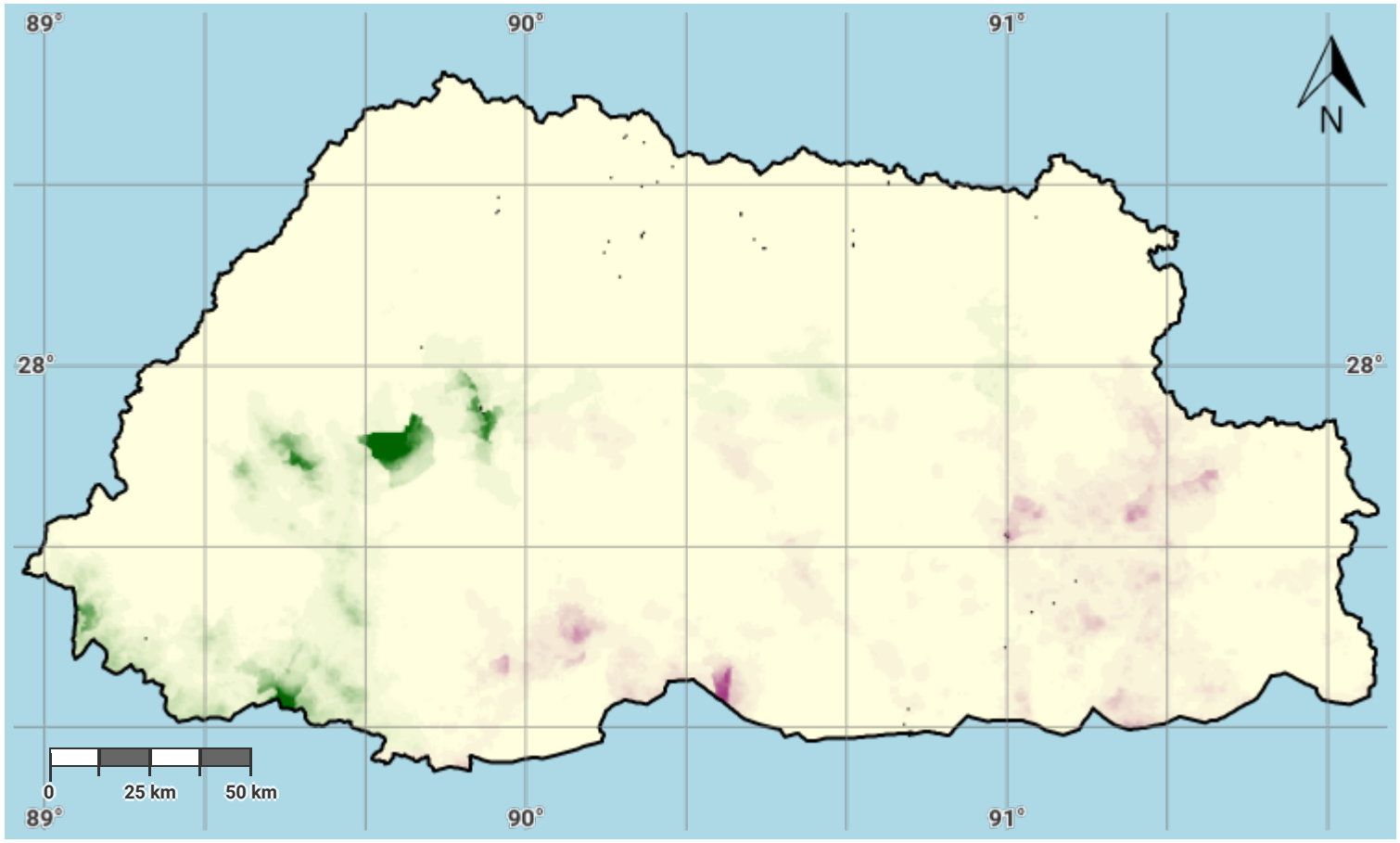
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M4

Drought exposure in fourth epoch of baseline period



Legend

- No data
- Population exposed to drought (number of people, total): 0 - 430
- No drought
- Population not exposed to drought (number of people, total): 0 - 430
- International Boundary

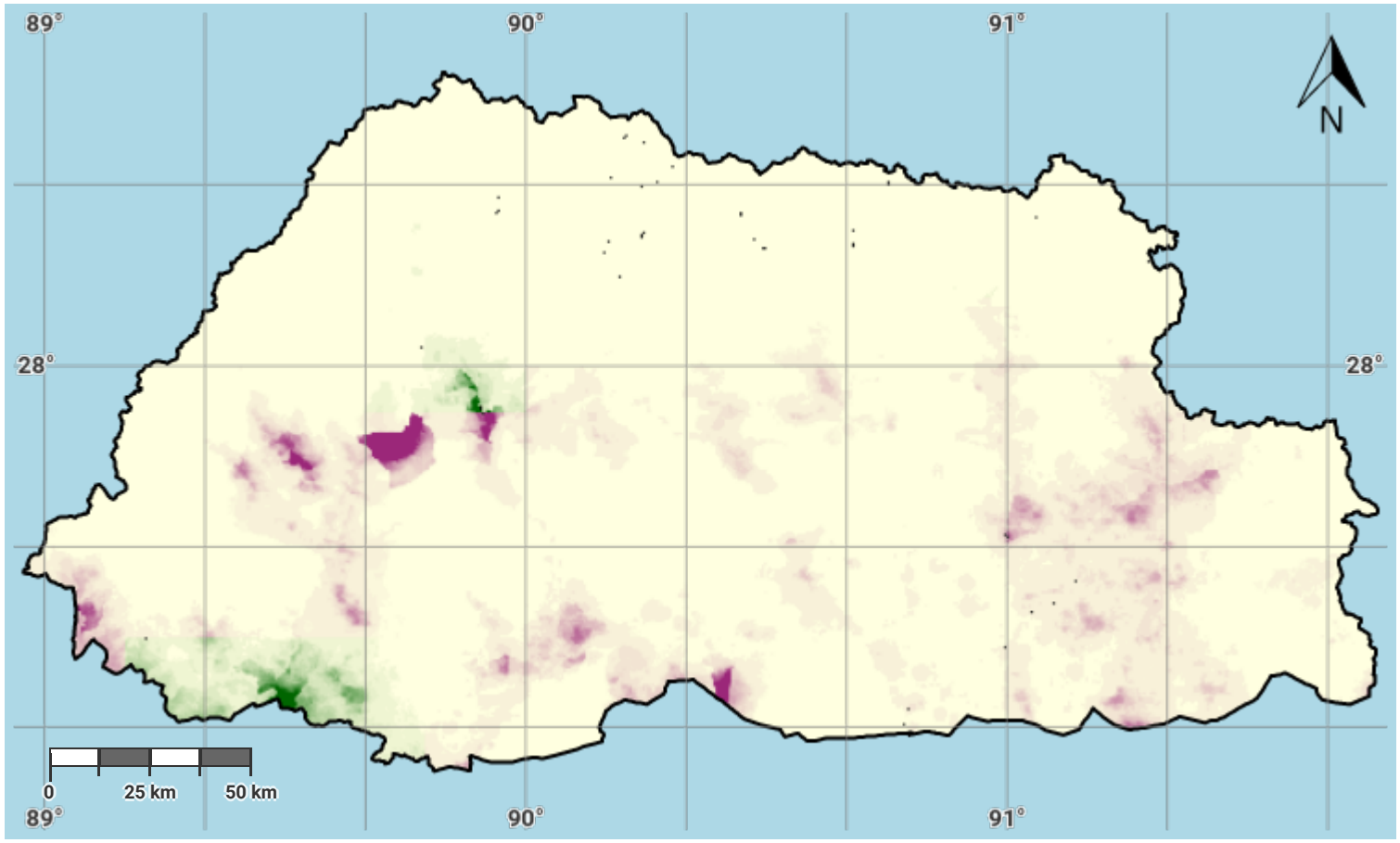
Projection: EPSG:3857 (Web Mercator)

Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M5

Drought exposure in the reporting period



Legend

- No data
- Population exposed to drought (number of people, total): 0 - 320
- No drought
- Population not exposed to drought (number of people, total): 0 - 320
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

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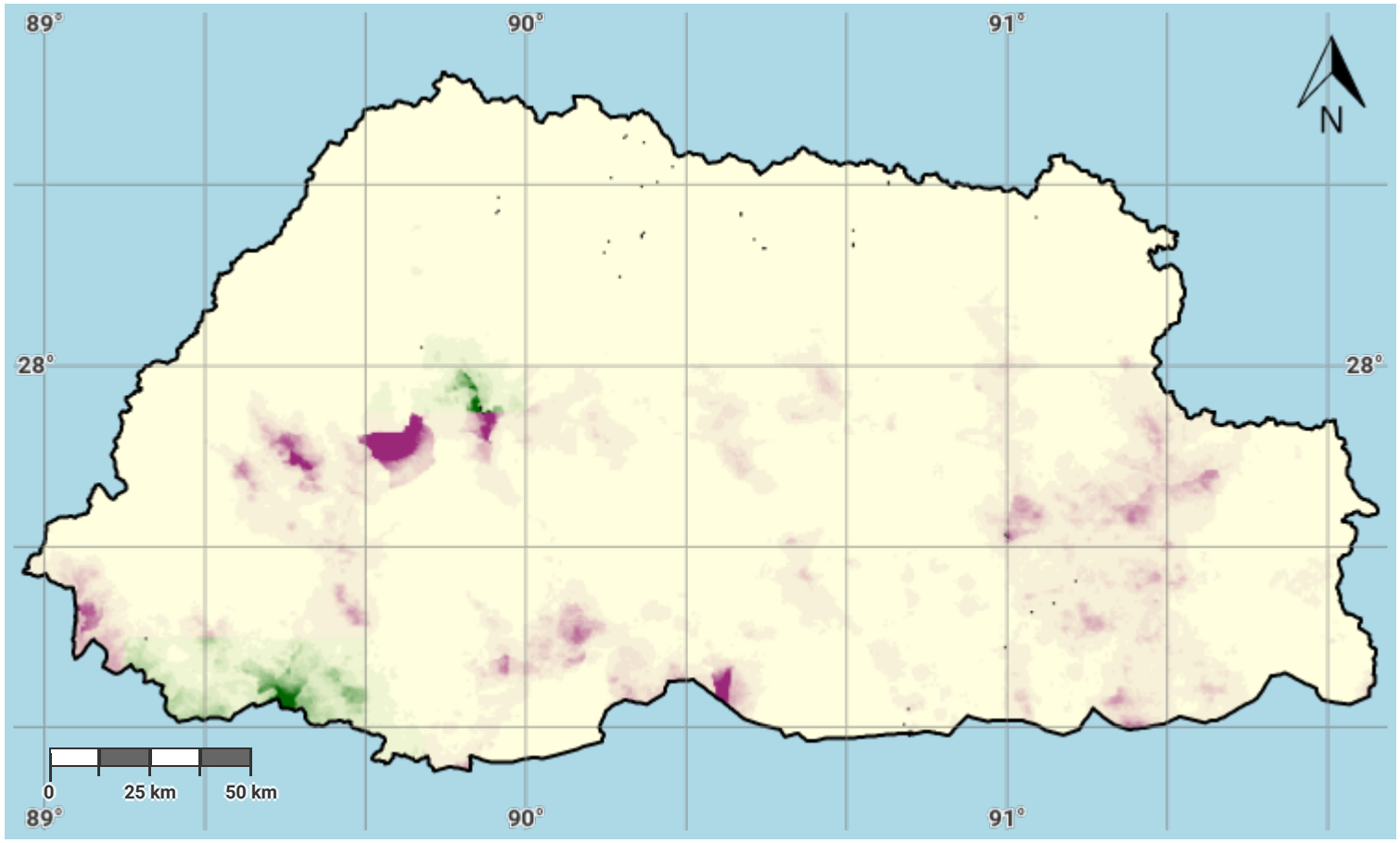
Bhutan – SO3-2.M6

Female drought exposure in the reporting period



Legend

- No data
- Population exposed to drought (number of people, female): 0 - 160
- No drought
- Population not exposed to drought (number of people, female): 0 - 160
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

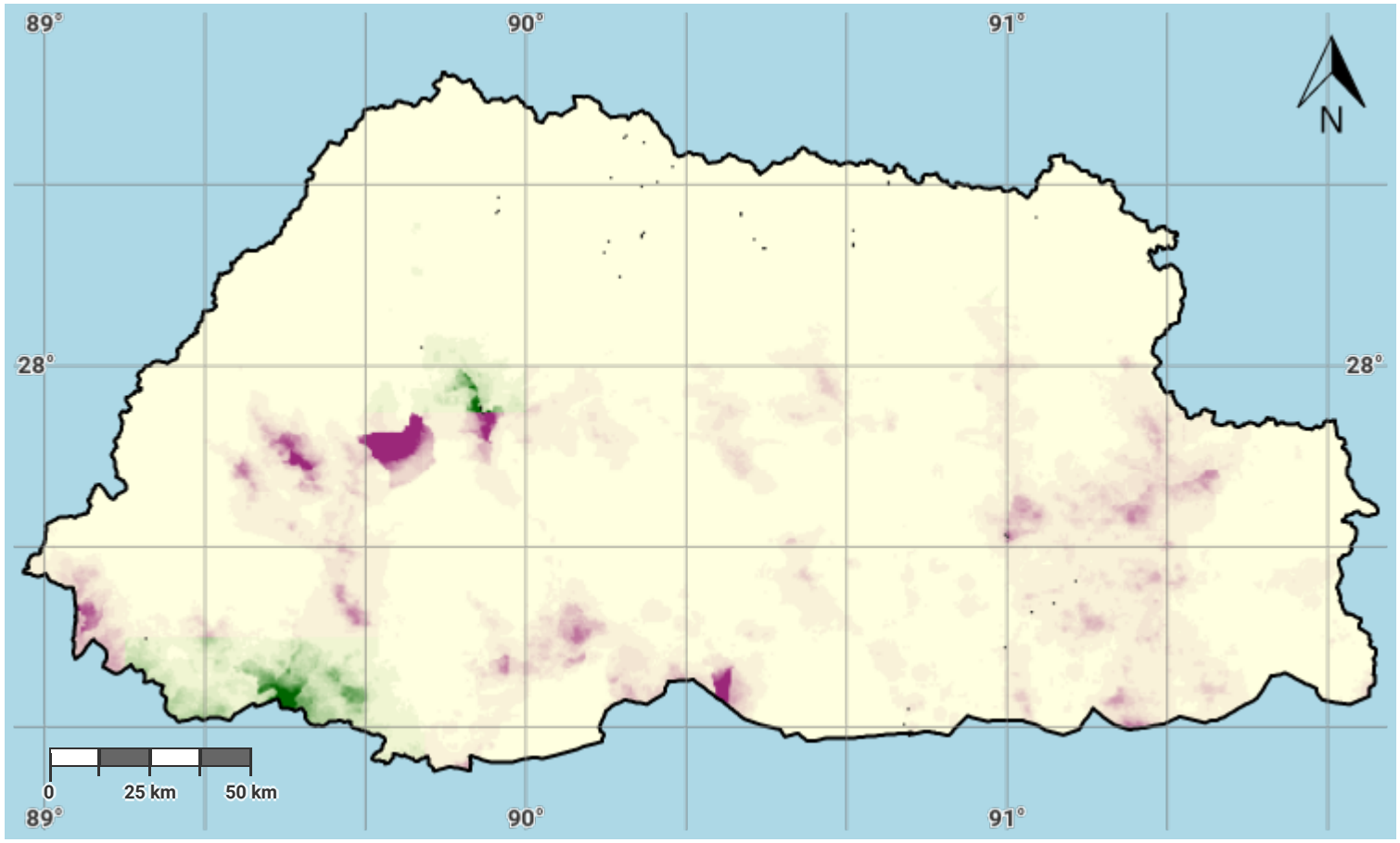
The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Convention to Combat Desertification (UNCCD) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. All maps represent the terrestrial area of the country; offshore islands, overseas departments and territories may not be displayed due to cartographic limitations.

Source Data Credits

- United Nations Clear Map, United Nations Geospatial.
- Global Precipitation Climatology Centre (GPCC) monthly precipitation products,1982–present. URL: https://opendata.dwd.de/climate_environment/GPCC/html/gpcc_monitoring_v6_doi_download.html

Bhutan – SO3-2.M7

Male drought exposure in the reporting period



Legend

- No data
- Population exposed to drought (number of people, male): 0 - 170
- No drought
- Population not exposed to drought (number of people, male): 0 - 170
- International Boundary

Projection: EPSG:3857 (Web Mercator)

Disclaimer

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Convention to Combat Desertification (UNCCD) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. All maps represent the terrestrial area of the country; offshore islands, overseas departments and territories may not be displayed due to cartographic limitations.

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