

How can countries improve estimations of SDG 15.3.1 and enhance national reporting of SO1?

LESSONS LEARNT

from participatory approaches during PRAIS4 reporting

WOCAT

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Common challenges

- Default estimations and maps are usually not representative of countries' reality and **underestimate** the proportion of land degraded (SDG 15.3.1).
- Technical difficulties to integrate national data and local knowledge.
- Not enough time to implement a proper interinstitutional participatory process.
- Resources not available on time.

Common interests

- Produce relevant maps and estimations of SDG indicator 15.3.1 that are consistent with the national knowledge.
- Conduct participatory processes that guarantee ownership and consensus.



WOCAT and FAO supported 6 countries to report SO1 through a participatory process (Türkiye, Colombia, Bhutan, Ecuador, Bosnia and Herzegovina, Panama)



GENERAL APPROACH



Facilitation of participatory workshops with diverse stakeholders that were **NOT necessarily GIS experts.**

Use of cloud computing for co-development of tools and easy to use applications to explore, compare, integrate and validate maps.



TRENDS IN LAND COVER (SO1-1)

CHOOSE BEST AVAILABLE DATA Pre processing of alternative data sets

SELECT A LEGEND

01

02 That allows monitoring of key degradation processes

TRANSITION MATRIX

03 Changes lead to degradation, improvement or are neutral

VALIDATE

04 Field validation, error adjusted area estimates

Choosing the Best available Land cover data

Land Cover Transition Analysis Apps

These apps allow users to compare alternative land cover datasets and re-categorizations as well as alternative land cover transition matrixes. With just a few clicks the transitions for different periods can be explored, as well as the final degradation due to land cover change maps (SO1-1). Statistics at different spatial scales, and for different periods, as well as resulting maps are easily obtained. For example, Bhutan experts used the app to compare alternative re-classifications of ESA CCI Land cover National, and alternative global land cover maps. Colombia compared alternative reclassifications of their national land cover maps.







Colombia Land Cover Transitions Tool - Codeveloped with IDEAM and the Ministry of Environment for PRAIS4 National Report. Languages: Spanish and English. Bhutan Land Cover Transitions Tool - Co-developed with the National Soil Services Centre during PRAIS4 National Reporting. Languages: English Panama tool to compare Degrdation due to Land Cover transitions using national data and expert knowledge. Languages: Spanish and English.

Improving estimations of SO1-1-

Use of default data can be improved by a more in depth analysis and reclassification. BiH, for example, identified shrublands as a separate category. This is an important and particular Mediterranean ecosystem that is also a hotspot of degradation. Bosnia and Herzegovina Default data, with shrublands



COUNTRY	DATA USED	LC CLASSES
Panama	National data – 2000, 2012, 2020	9 categories – e.g.: Mangroves
Colombia	National data -2001, 2012, 2019	12 categories – e.g.: Snow and glaciers
Ecuador	National data - 2000, 2014, 2018	7 categories
BiH	Global (ESA CCI) reclassified	8 categories e.g.: shrublands
Türkiye	Regional data (CORINE) – 2000, 2012, 2018	7 categories
Bhutan	Global (ESA CCI) reclassified	7 categories e.g.: Shrublands

Transition matrix



	Forests	Shrublands	Grasslands	Agroforestry	Pastures	Cropland	Productive Mosaics	Artificial	Bareland	Snow and glaciers	Wetlands	Water
Forests	4n	2-2n	2n2-	3-1n	4-	4-	4-	4-	4-	3n1+	3n1-	3-1n
Shrublands	1+3n	4n	2-2n	3-1+	4-	4-	4-	4-	4-	3n1+	3n1-	3-1n
Grasslands	2+2n	2n2+	4n	1+3-	4-	3-1n	2n2-	4-	4-	3n1+	2-1n1+	3-1n
Agroforestry	4+	4+	2+1n1-	4n	3-1n	3-1n	2n2-	4-	4-	4n	3+1-	3-1n
Pastures	4+	4+	3+1n	4+	4n	1+1-2n	3+1n	4-	4-	4n	3+1-	3-1n
Cropland	4+	4+	2+2n	4+	4n	4n	3+1n	4-	4-	4n	3+1-	3-1n
Productive Mosaics	4+	4+	3+1n	2+2n	4-	3-1n	4n	4-	4-	4n	3+1-	3-1n
Artificial	4+	4+	4+	4+	4+	4+	4+	4n	2n1-1+	4n	3+1-	3-1n
Bareland	4+	4+	4+	4+	4+	4+	4+	3n1+	4n	4n	4+	2-2n
Snow and glaciers	2n2-	2n2-	2n2-	3-1n	3-1n	3-1n	3-1n	3-1n	3-1n	4n	3n1-	2-2n
Wetlands	4+	3n1-	2n2-	4-	4-	4-	4-	4-	4-	4n	4n	4n
Water	4+	2-2+	2-2+	2-2+	2-2+	2-2+	2-2+	3n1-	3n1-	4n	3+1-	4n

n NEUTRAL + POSITIVE - NEGATIVE

Results in Colombia

TRENDS IN LAND PRODUCTIVITY (SO1-2)

CHOOSE BEST AVAILABLE DATA Trade off between temporal and spatial resolution

EXPLORE DIFFERENT ANALYSIS

02 SAVI, EVI, NDVI, ESPI, algorithms, periods, trends in precipitation, etc

EXPERT KNOWLEDGE

03 Choose the most representative result via a participatory process

VALIDATE

01

04 Field validation, identification of false positives and negatives

National Expert Assessments

- 5 LPD Maps were explored and compared
- Experts from different sectors use their knowledge and data to compare results



Types of sites for the comparison of maps



র্ণাশ র্ভণ ন্ন গ্রীন শাল্পনশ দ্বিণ থদ জুনশ। DEPARTMENT OF FORESTS AND PARK SERVICES MINISTRY OF ENERGY AND NATURAL RESOURCES ROTAL GOVERNMENT OF BHUTAN

Degraded Forests

- 1. Forest fires: forest fire near Thimphu
- 2. Bark beetle infestation in Uruk
- 3. Timber Extraction Area
- 4. Timber extraction area using cable
- 5. Hydroelectric plant



Overgrazed grasslands

Longzhi Grassland, overgrazing in northern mountainous areas with grazing by yaks Grasslands and wetlands with overgrazing, grazed by cattle during summer months and during the winter by yaks, so all year long grazing.

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SLM in Agricultural lands

- 1- SLM project Wangphu Gewog
- 2-Borangma, Norbugang rehabilitation site
- 3- Namlaythang, Tsangkha rehabilitation site
- 4- Wangphu land management site



<u>Mining sites</u>

- 1- Marug ri, Nganglam 2015
- 2- Gumtu, limestone mine
- 3- Paro, Gebjana Stone Quarry 2010-2019



ঞ্জাব্রিমর্থের স্ট্রমান্দ্রন্দর্শনি বেইর। NATIONAL STATISTICS BUREAU Towards Supporting Evidence-Based Decision Making



- 1. Toorsa developing area
- 2. Thimphu district statistical analysis

The most representative LPD map

1.- Which model is best for your country?

- 2.- Which processes relate with the "Red areas"?
- 3.- Which processes relate to "Green areas"?
- 4.- What is the model that provides the worst results?



Land Productivity Dynamics (LPD) Comparison Apps

These apps allow users to interactively compare and validate alternative LPD maps (SO1-2). Statistics at different spatial scales are shown in the app, and experts can use their own knowledge to validate the different LPD maps (for example FAO-WOCAT LPD, IRC, Trends Earth, etc) by looking at known areas that are hotspots of brightspots. Stakeholders from different sectors can discuss in groups and vote for the most representative LPD map. For example, Panama experts compared 5 different LPD maps using the LPD Comparison Tool and chose an LPD map obtained with Trends Earth, whereas experts from Bhutan chose WOCAT-FAO LPD map for PRAIS4 report.



PRAIS4 Comparison App - Co-developed with FAO and Conservation International to support countries in choosing the most appropiate datasets for PRAIS4 reporting



Kazakhstan Expert Knowledge Comparison Tool -Linked to a survey this tool allows experts to compare and choose the most appropiate Land Cover and LPD maps. Languages: Russian and English



Panama LPD Comparison Tool - Co-developed with the Ministry of Environment for PRAIS4 national reporting process, to support integration of expert knowledge. Languages: Spanish and English



Bhutan Land Productivity Dynamics Comparison Tool - Co-developed with the National Soil Services Centre during PRAIS4 National Reporting



Ecuador LPD comparison tool - Co-developed with CONDESAN and the Ministry of Environment, Water and Ecological transition to integrate expert knowledge during the PRAIS4 national report process. Languages: Spanish and English.



Colombia LPD Comparison Tool -Co-developed with IDEAM and the Ministry of Environment for PRAIS4 National Report. Languages: Spanish and English.



DATA SETS USED FOR TRENDS IN LAND PRODUCTIVITY

	LPD Data used
Panama	Trend.Earth default LPD
Colombia	WOCAT-FAO LPD
Ecuador	Trends.Earth climate correction
Bosnia and Herzegovina	WOCAT-FAO LPD
Türkiye	WOCAT-FAO LPD
Bhutan	WOCAT-FAO LPD

TRENDS IN CARBON STOCKS (SO1-3)

OI CHOOSE BEST AVAILABLE DATA

02 ESTIMATE NATIONAL CONVERSION FACTORS

03 DIFFERENT MODELS

VALIDATE

04

Nationally determined Convertion Factors in Türkiye + National SOC Map + Regional Land Cover

						Trends.Ear	th				
Original LC	Target LC	Turkey CF	Upper Sakarya CF	Temp. Dry	Temp. Moist	Trop. Dry	Trop. Moist	Trop. Montain	Diff	Suna CF	New CF
				0.8	0.69	0.58	0.48	0.64			
Tree-covered	Tree-covered	1	1	1	1	1	1	1	0	1	
Grassland	Tree-covered	1.024009897	1.092408273	1	1	1	1	1	0.024009897	1.118746233	1
Cropland	Tree-covered	1.419386335	1.390235443	1.25	1.449275362	1.724137931	2.0833333333	1.5625	0.169386334	1.548387097	1
Wetland	Tree-covered	0.943901304	1.019856677	1	1	1	1	1	-0.05609869	1.12009656	
Artificial	Tree-covered	1.363875132	1.293507248	2	2	2	2	2	-0.63612486	3.454094293	
Other land	Tree-covered	0.880028970	1.104399939	2	2	2	2	2	-1.11997103	4.356807512	
Water body	Tree-covered	1.118744965	1.027985411	1	1	1	1	1	0.118744965	1.12009656	
Tree-covered	Grassland	0.976553061	0.9154086663	1	1	1	1	1	-0.02344693	0.893857758	C
Grassland	Grassland	1	1	1	1	1	1	1	0	1	
Cropland	Grassland	1.38610607	1.272633573	1.25	1.449275362	1.724137931	2.083333333	1.5625	0.136106070	1.38403782	1
Wetland	Grassland	0.921769708	0.9335856406	1	1	1	1	1	-0.07823029	1.001207001	
Artificial	Grassland	1.331896436	1.184087744	2	2	2	2	2	-0.66810356	3.087468983	2
Other land	Grassland	0.859394985	1.010977275	2	2	2	2	2	-1.14060501	3.894366197	
Water body	Grassland	1.092513821	0.9410267545	1	1	1	1	1	0.092513820	1.001207001	
Tree-covered	Cropland	0.704529820	0.7193026223	0.8	0.69	0.58	0.48	0.64	-0.09547017	0.645833333	C
Grassland	Cropland	0.721445509	0.7857721351	0.8	0.69	0.58	0.48	0.64	-0.07855449	0.722523608	C
Cropland	Cropland	1	1	1	1	1	1	1	0	1	
Wetland	Cropland	0.665006616	0.7335855822	0.71	0.71	0.71	0.71	0.71	-0.04499338	0.723395695	C
Artificial	Cropland	0.960890702	0.9304231552	2	2	2	2	2	-1.03910929	2 220760221	
Other land	Cropland	0.620006652	0.794397772	2	2	2	2	2	-1.37999334	2	
Water body	Cropland	0.78818919	0.7394326021	1	1	1	1	1	-0.21181081	C	1
Tree-covered	Wetland	1.059432798	0.9805299338	1	1	1	1	1	0.059432798	C	6
Grassland	Wetland	1.084869671	1.071139011	1	1	1	1	1	0.084869670	C	1 -1
Cropland	Wetland	1.503744436	1.363167467	1.4084507	1.408450704	1.408450704	1.408450704	1.408450704	0.095293732	1	The
Wetland	Wetland	1	1	1	1	1	1	1	0	-	18
Artificial	Wetland	1.444934048	1.268322576	2	2	2	2	2	-0.55506595	3	1.
Other land	Wetland	0.932331554	1.082897199	2	2	2	2	2	-1.06766844	3	2



Colombia: BASELINE

Erosion (2011): Salinization (2017): Severe and very severe very severe Grado de salinización (2017) Grado de erosión (2011)



Colombia: REPORTING PERIOD

- 1. SOC degradation: rate of loss higher than 5% (compared to initial value) in BAU.
- 2. SOC improvement: rate of SOC gains higher than 5% (compared to initial value) in BAU.



Colombia: Soil Organic Carbon Sequestration Potential National Map National Report. Version 1.0. Year: 2021

Gustavo A. Araujo-Carrillo¹, Viviana M. Varón-Ramirez¹, Dougles A. Córnez-Laterre¹, Reinaldo Sanchez L.^{an}, Heimer Guzman L.^{an}, Elsina K. Forsseia G.^{an}, Maria J. Morales S.^{an}, Juppiolen Ordonez¹, Lady Reddingue², Oldu J. Cospita A¹, Netson F. Lozano G.^a, Blanca C. Medina P³, Sebastian Acosta T^a, Claudia K. Ortz V.^a, Jorge Gutierrez², Adriana Bolare G.^a, and Dieso Perloraz C^a.

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COMPARING DEFAULT vs REPORTED SDG 15.3.1

Countries used alternative data sources and integrated expert knowledge

There were BIG differences...





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



SO1-4.T1: Estimaciones nacionales de la superficie total de las tierras degradadas (en kilómetros cuadrados), y proporción de tierras degradadas en comparación con la superficie terrestre total

	Superficie total de las tierras degradadas (km²)	Proporción de tierras degradadas en comparación con la superficie terrestre total (%)
Período de Referencia	331 897	28,8
Período sobre el que se informa	343 934	29,8
Variación de la extensión de las tierras degradadas	12037	Reported

SDG 15.3.1: DEFAULT AND REPORTED

REPORTED DEGRADATION WAS USUALLY HIGHER THAN DEFAULT ESTIMATIONS

	BASE	ELINE	REPORTING PERIOD			
	Default	Reported	Default	Reported		
Panama	9.4	35.2	10.4	32.2		
Colombia	7.6	28.8	8.8	29.8		
Ecuador	8	21.9	10	12.8		
Bosnia and Herzegovina	7.9	8.5	7.9	6.8		
Turkey	1.4	14.3	3.4	13.4		
Bhutan	2.7	11.9	11.1	13.5		



🗞 remote sensing

Combining Earth Observations, Cloud Computing, and Expert Knowledge to Inform National Level Degradation Assessments in Support of the 2030 Development Agenda



Juan Calles Lopez, Eugenia Raviolo, Ana María Díaz-González, Hernán González oledad Bastidas, Cristian Morales-Opazo, César Luis García

Environmental Science and Policy

Land degradation assessment in the Argentinean Puna: Comparing expert knowledge with satellite-derived information

accents lists available at ScienceDirect

PARTICIPATORY PROCESSES TO MAP LD

allowed for inclusive, participatory, inter-institutional, multi-stakeholder processes versus an individual/consultant-based reporting process

developed long-term capacities for LDN within the Ministries, using the reporting process as an opportunity and momentum

developed a country-owned maps and systems useful beyond the reporting process to guide decisions in land management and restoration overall, also in relation to the climate and biodiversity targets



Türkiye LDN DSS



Türkiye LDN ACTION PLAN: where to avoid, reduce or reverse LD?

SOC		Erosion	l	LPD	Ís
300		low	<2 tonnes/ha	Declining	declining + early signs of decline
nign	>40 tonnes/ha	medium	2-10 tonnes/ha	Ctable	stable i stable but stressed
low	<40 tonnes/ha	mediam	2 10 tonines/nu	Stable	stable + stable but stressed
		severe	>10 tonnes/ha	Increasing	increasing

500	Fracian	Land Productivity Dynamics				
300	Erosion	Declining	Stable	Increasing		
high	low	AVOID	AVOID	AVOID		
high	medium	REDUCE	AVOID	AVOID		
high	severe	REDUCE	REDUCE	AVOID		
low	low	REDUCE	REDUCE	AVOID		
low	medium	REVERSE	REDUCE	REDUCE		
low	severe	REVERSE	REVERSE	REDUCE		



LDN ACTION PLAN in the LDN DSS



LDN ACTION PLAN in the LDN DSS

Suggested actions

No data

Forest Conservation Forest Management Forest Rehabilitation Grassland Conservatio Grassland Managemen Grassland Rehabilitatio Cropland Conservation Cropland Management Cropland Rehabilitation





WOCAT

REPÚBLICA DE PANAMÁ GOLENO NACIONA

Using national data and expert knowledge to map land degradation, to estimate SDG 15.3.1 and to report to UNCCD: successful stories from 6 countries

> 16-Nov, 18:00 - 20:00 Conference room: MET-10

South-South Knowledge Exchange to achieve Land Degradation Neutrality (LDN)



United Nations Convention to Combat Desertification

CRIC 21, Samarkand, Uzbekistan, 2023

More Information from the countries:

Come to the side event!

Today, at 18 hs, MET10

THANK YOU!

Ster an at