

Trends.Earth - Taarifa za Jumla

version 2.3.4

Conservation International

October 01, 2026

Contents

General information	1
Kuwasiliana na timu ya Itrends.earthI	1
Authors	1
Acknowledgements	1
Citation	2
License	2
Trademark	2
Publications	2
Peer-reviewed Publications	2
Academic dissertations	5
Other resources	5

General information

Trends.earth ilizalishwa kama sehemu ya mradi wa "kuwezesha matumizi ya vyanzo vya data duniani kupima na kufuatilia uharibifu wa ardhi (mazingira) katika ukubwa tofauti tofauti", ukifadhiliwa na Global Environment Facility yaani Taasisi ya Mazingira Duniani.

Kuwasiliana na timu ya Itrends.earth

Wasiliana na timu ya *Trends.Earth* <[mailto: trends.earth@conservation.org](mailto:trends.earth@conservation.org)> kwa kutoa maoni au mapendekezo yoyote. Kama una taarifa za kuripoti juu ya virusi au kupendekeza kuhimarishwa kwa chombo hiki unaweza kuwasilisha kwenye [tracker](#) ya [Github](#) kwa [TRENDSEARTH](#).

Authors

Mradi wa Ufuatiliaji wa Uharibifu wa Ardhi ni ushirikiano wa shirika la Conservation International, Chuo Kikuu cha Lund, na National Aeronautics and Space (NASA), na unafadhiliwa na Global Environment Facility (GEF)/ Chombo cha Mazingira Duniani.

Wachangiaji katika uandishi wa nyaraka za Itrends.earth| ni pamoja na Yengoh Genesis, Lennart Olsson, Mariano Gonzalez-Roglich, Monica Noon, Tristan Schnader, Anna Tengberg, na Alex Zvoleff.



[TRENDSEARTH](#) inatumia [Google Earth Engine](#) kupitia mtandao kukokotoa viashiria vya uharibifu wa ardhi.

Google Earth Engine

The [Tools4LDN](#) Project is a partnership of Conservation International, University of Bern, University of Colorado in partnership with USDA and USAID, University of California - Santa Barbara in partnership with University of North Carolina - Wilmington and Brown University and is funded by the Global Environment Facility (GEF).

Contributors to the documentation and to [TRENDSEARTH](#) include Gabriel Daldegan, Mariano Gonzalez-Roglich, Monica Noon, and Alex Zvoleff in partnership with Jeff Herrick, Tatenda Lemann, Hanspeter Liniger, David Lopez-Carr, Kevin Mwenda, Jason Neff, George Peacock, Narcisa Pricope, Sanna Sokolow, and Ingrid Teich.

Acknowledgements

Maoni yaliyotolewa na watumiaji wa awali wa [TRENDSEARTH](#) na washiriki kwa njia ya video na warsha zilizofanywa na Mradi wa Ufuatiliaji wa Uharibifu wa Ardhi ya GEF zimekuwa muhimu kwa maendeleo ya chombo hiki.

Neil Sims, Sasha Alexander, Renato Cumani, na Sara Minelli walitoa mapendekezo juu ya utekelezaji wa viashiria vya SDG 15.3 na LDN vya uharibifu wa ardhi katika [TRENDSEARTH](#), juu ya muundo wa chombo, na mchakato wa kuripoti kwa UNCCD, na pia walitoa mapendekezo ya awali na kujaribiwa kwa utendaji kazi wa chombo.

Mradi unawatambua washiriki wa semina iliyofanyika Morogoro, Tanzania Oktoba, 2017 kwa kutoa mrejesho na maoni yao juu ya chombo hiki: Jones Agwata, Col. Papa Assane Ndiour, Lt Fendama Baldé, Papa Nékhou Diagne, Abdoul Aziz Diouf, Richard Alfonse Giliba, Moses Isabirye, Vettes Kalema, Joseph Kihale, Prof. DN Kimaro, James Lwasa, Paulo Mandela, Modou Moustapha Sarr, Joseph Mutyaba, Stephen Muwaya, Joseph Mwalugelo, Prof Majaliwa Mwanjalolo, Edson Aspon Mwijage, Jerome Nchimbi,

Citation

Elibariki Ngowi , Tabby Njunge, Daniel Nkondola, Blaise Okinyi, Joseph Opio, Rozalia Rwegasira, Ndeye Kany Sarr, Mamadou Adama Sarr, Edward Senyonjo, Olipa Simon, Samba Sow, Felly Mugizi Tusiime na John Wasige.

Citation

Ikiwa ungependa kutaja | trends.earth |, tafadhali tumia funguo ifuatayo:

Trends.Earth. Conservation International. Available online at: <http://trends.earth>. 2026.

License

▲TRENDS.EARTH ni bure and huru kwa waendelezaji wa chombo hiki. Kimeundwa chini ya mpango wa Leseni Huru kwa Umma yaani [GNU General Public License, toleo 2.0 au zaidi](#).

Tovuti hii na vitu vyote vya ▲TRENDS.EARTH hupatikana chini ya masharti ya [Leseni ya Kimataifa ya Creative Commons Attribution 4.0 \(CC BY 4.0\)](#). Mipaka ya matumizi na majina yaliyotumika katika ▲TRENDS.EARTH haimaanishi vimeidhinishwa rasmi au kukubaliwa na Conservation International Foundation, au mashirika washirika wake na wachangiaji.

Trademark

▲TRENDS.EARTH has a service mark trademark registered June 9, 2020 (reg. No. 6,074,442 and Int. Cl.: 9,35,42) by the United States Patent and Trademark Office.

Publications

Peer-reviewed Publications

The below peer-reviewed publications either use or relate to ▲TRENDS.EARTH.

- Alamanos, A. and Linnane, S., 2021. Estimating SDG Indicators in Data-Scarce Areas: The Transition to the Use of New Technologies and Multidisciplinary Studies. *Earth*, 2(3), pp.635-652.
- Cherif, I., Kolintziki, E. and Alexandridis, T.K., 2023. Monitoring of land degradation in Greece and Tunisia using trends. *Earth with a focus on cereal croplands. Remote Sensing*, 15(7), p.1766.
- Di Leginio, M., Agrillo, A., Congedo, L., Munafo, M., Riitano, N., Terribile, F. and Manna, P., 2024. Analysis of trends in productivity metrics in assessing land degradation: A case study in the Campania region of southern Italy. *Ecological Indicators*, 161, p.111962.
- Dong, J., Metternicht, G., Hostert, P., Fensholt, R., Chowdhury, R.R., 2019. Remote sensing and geospatial technologies in support of a normative land system science: status and prospects. *Curr. Opin. Environ. Sustain.* 38, 44–52. <https://doi.org/10.1016/j.cosust.2019.05.003>
- Easdale, M.H., Fariña, C., Hara, S., Pérez León, N., Umaña, F., Tittonell, P., Bruzzone, O., 2019. Trend-cycles of vegetation dynamics as a tool for land degradation assessment and monitoring. *Ecol. Indic.* 107, 105545. <https://doi.org/10.1016/j.ecolind.2019.105545>
- Ferroni, F., Micalizzi, K., Attorre, F., Sun, X. and Cioffi, F., 2025. Remote Sensing for SDG 15.3: Advancing Sustainable Cocoa Agriculture in Ghana Using Trends. *Earth. MDPI. International Conference on Advanced Remote Sensing (ICARS 2025) session Remote Sensing for Agriculture, Water and Food Security*

- Giuliani, G., Chatenoux, B., Benvenuti, A., Lacroix, P., Santoro, M., Mazzetti, P., 2020a. Monitoring land degradation at national level using satellite Earth Observation time-series data to support SDG15 – exploring the potential of data cube. *Big Earth Data* 4, 3–22. <https://doi.org/10.1080/20964471.2020.1711633>
- Giuliani, G., Mazzetti, P., Santoro, M., Nativi, S., Van Bemmelen, J., Colangeli, G., Lehmann, A., 2020b. Knowledge generation using satellite earth observations to support sustainable development goals (SDG): A use case on Land degradation. *Int. J. Appl. Earth Obs. Geoinformation* 88, 102068. <https://doi.org/10.1016/j.jag.2020.102068>
- Gonzalez-Roglich, M., Zvoleff, A., Noon, M., Liniger, H., Fleiner, R., Harari, N., Garcia, C., 2019. Synergizing global tools to monitor progress towards land degradation neutrality: Trends.Earth and the World Overview of Conservation Approaches and Technologies sustainable land management database. *Environ. Sci. Policy* 93, 34–42. <https://doi.org/10.1016/j.envsci.2018.12.019>
- Jalem, D.K., 2023. Spatio-Temporal Assessment of Land Degradation Neutrality (LDN) status in Chhattisgarh, India (2001–2022) Using Trends. *Earth. Educational Administration: Theory and Practice*, 30(1), pp.5887-5897.
- Janer, I.C. and Jimenez, F., 2022. Land-use changes by Old Colonies Mennonites in Mexico with Sentinel 2 and Trends Earth. *European Journal of Agriculture and Food Sciences*, 4(3), pp.17-23.
- Jiang, L., Bao, A., Jiapaer, G., Liu, R., Yuan, Y. and Yu, T., 2022. Monitoring land degradation and assessing its drivers to support sustainable development goal 15.3 in Central Asia. *Science of The Total Environment*, 807, p.150868. <https://doi.org/10.1016/j.scitotenv.2021.150868>
- Kadaverugu, A., Nageshwar Rao, C. and Viswanadh, G.K., 2021. Quantification of flood mitigation services by urban green spaces using InVEST model: a case study of Hyderabad city, India. *Modeling Earth Systems and Environment*, 7(1), pp.589-602. <https://doi.org/10.1007/s40808-020-00937-0>
- Kust, G.S., Andreeva, O.V., Lobkovskiy, V.A., 2020. Land Degradation Neutrality: the Modern Approach to Research on Arid Regions at the National Level. *Arid Ecosyst.* 10, 87–92. <https://doi.org/10.1134/S2079096120020092>
- Hu, Y., Wang, C., Yu, X. and Yin, S., 2021. Evaluating Trends of Land Productivity Change and Their Causes in the Han River Basin, China: In Support of SDG Indicator 15.3. 1. *Sustainability*, 13(24), p.13664. <https://doi.org/10.3390/su132413664>
- Li, Z., Lun, F., Liu, M., Xiao, X., Wang, C., Wang, L., Xu, Y., Qi, W., Sun, D., 2021. Rapid diagnosis of agricultural soil health: A novel soil health index based on natural soil productivity and human management. *J. Environ. Manage.* 277, 111402. <https://doi.org/10.1016/j.jenvman.2020.111402>
- Liniger, H., Harari, N., van Lynden, G., Fleiner, R., de Leeuw, J., Bai, Z., Critchley, W., 2019. Achieving land degradation neutrality: The role of SLM knowledge in evidence-based decision-making. *Environ. Sci. Policy* 94, 123–134. <https://doi.org/10.1016/j.envsci.2019.01.001>
- Mariathan, V., Bezuidenhout, E., Olympio, K.R., 2019. Evaluation of Earth Observation Solutions for Namibia's SDG Monitoring System. *Remote Sens.* 11, 1612. <https://doi.org/10.3390/rs11131612>
- Mazzetti, P., Nativi, S., Santoro, M., Giuliani, G., Rodila, D., Folino, A., Caruso, S., Aracri, G. and Lehmann, A., 2022. Knowledge formalization for Earth Science informed decision-making: The GEOEssential Knowledge Base. *Environmental Science & Policy*, 131, pp.93-104. <https://doi.org/10.1016/j.envsci.2021.12.023>
- Meyer, D. & Riechert, M. Open source QGIS toolkit for the Advanced Research WRF modelling system. *Environmental Modelling & Software* 112, 166–178 (2019). <https://doi.org/10.1016/j.envsoft.2018.10.018>
- Moussa, S., El Brirchi, E.H. and Alami, O.B., 2022. Monitoring Land Productivity Trends in Souss-Massa Region Using Landsat Time Series Data to Support SDG Target 15.3. In *Geospatial Intelligence* (pp. 119-129). Springer, Cham. https://doi.org/10.1007/978-3-030-80458-9_9

- Ogorodnikov, S.S., 2021, March. Land Degradation Neutrality in the Tula region. In IOP Conference Series: Earth and Environmental Science (Vol. 723, No. 4, p. 042053). IOP Publishing. doi:10.1088/1755-1315/723/4/042053
- Prakash, M., Ramage, S., Kavvada, A., Goodman, S., 2020. Open Earth Observations for Sustainable Urban Development. *Remote Sens.* 12, 1646. <https://doi.org/10.3390/rs12101646>
- Philip, E., 2021. Coupling Sustainable Development Goal 11.3. 1 with current planning tools: city of Hamilton, Canada. *Hydrological Sciences Journal*, 66(7), pp.1124-1131. <https://doi.org/10.1080/02626667.2021.1918340>
- Reith, J., Ghazaryan, G., Muthoni, F. and Dubovyk, O., 2021. Assessment of Land Degradation in Semiarid Tanzania—Using Multiscale Remote Sensing Datasets to Support Sustainable Development Goal 15.3. *Remote Sensing*, 13(9), p.1754. <https://doi.org/10.3390/rs13091754>
- Rowe, H.I., Gruber, D. and Fastiggi, M., 2021. Where to start? A new citizen science, remote sensing approach to map recreational disturbance and other degraded areas for restoration planning. *Restoration Ecology*, 29(6), p.e13454. <https://doi.org/10.1111/rec.13454>
- Schiavina, M., Melchiorri, M., Freire, S., Florio, P., Ehrlich, D., Tommasi, P., Pesaresi, M. and Kemper, T., 2022. Land use efficiency of functional urban areas: Global pattern and evolution of development trajectories. *Habitat International*, 123, p.102543. <https://doi.org/10.1016/j.habitatint.2022.102543>
- Sims, N. C. et al. Developing good practice guidance for estimating land degradation in the context of the United Nations Sustainable Development Goals. *Environmental Science & Policy* 92, 349–355 (2019). <https://doi.org/10.1016/j.envsci.2018.10.014>
- Teich, I., Gonzalez Roglich, M., Corso, M.L., García, C.L., 2019. Combining Earth Observations, Cloud Computing, and Expert Knowledge to Inform National Level Degradation Assessments in Support of the 2030 Development Agenda. *Remote Sens.* 11, 2918. <https://doi.org/10.3390/rs11242918>
- Timm Hoffman, M., Skowno, A., Bell, W. & Mashele, S. Long-term changes in land use, land cover and vegetation in the Karoo drylands of South Africa: implications for degradation monitoring. *African Journal of Range & Forage Science* 35, 209–221 (2018). <https://doi.org/10.2989/10220119.2018.1516237>
- Torres, R.A.C., Wang, J., Zhang, J., Liu, L. and Lan, Y., 2024. Temporal analysis of land degradation and urban expansion in central Yunnan Province using remote sensing for supporting sustainable development goals 11/15. *Ecological Indicators*, 163, p.112058.
- Trifonova, T.A., Mishchenko, N.V., Shutov, P.S. et al. Estimation of the Dynamics of Production Processes in Landscapes of the South Taiga Subzone of the Eastern European Plain by Remote Sensing Data. *Moscow Univ. Soil Sci. Bull.* 76, 11–18 (2021). <https://doi.org/10.3103/S0147687421010063>
- Venter, Z.S., Scott, S.L., Desmet, P.G., Hoffman, M.T., 2020. Application of Landsat-derived vegetation trends over South Africa: Potential for monitoring land degradation and restoration. *Ecol. Indic.* 113, 106206. <https://doi.org/10.1016/j.ecolind.2020.106206>
- von Maltitz, G.P., Gambiza, J., Kellner, K., Rambau, T., Lindeque, L., Kgope, B., 2019. Experiences from the South African land degradation neutrality target setting process. *Environ. Sci. Policy* 101, 54–62. <https://doi.org/10.1016/j.envsci.2019.07.003>
- Xoxo, S., Mantel, S., De Vos, A., Mahlaba, B., Le Maitre, D. and Tanner, J., 2022. Towards SDG 15.3: The biome context as the appropriate degradation monitoring dimension. *Environmental Science & Policy*, 136, pp.400-412.
- Zimba, H.M., Banda, K.E., Mbewe, S. and Nyambe, I.A., 2024. Integrated use of the CA–Markov model and the Trends. Earth module to enhance the assessment of land cover degradation. *Environmental Systems Research*, 13(1), p.25.

Academic dissertations

- Mahlaba, B., 2022. The assessment of degradation state in Ecological Infrastructure and prioritisation for rehabilitation and drought mitigation in the Tsitsa River Catchment (Masters dissertation, Rhodes University).
- Owuor, G.O., 2021. Monitoring Land Degradation Neutrality using Geospatial Techniques in Support of Sustainable Land Management: A Case Study of Narok County (Doctoral dissertation, University of Nairobi).
- Tran, T.D.C., 2020. Land degradation in Switzerland. An application of the Trends.Earth model. (Complementary Certificate in Geomatic, Faculté des Sciences de la Société, Université de Genève)

Other resources

Print documentation from the Trends.Earth project (including fact sheets, reports, and other materials) is listed below.

Reports

- [A Review of Publicly Available Geospatial Datasets and Indicators In Support of Land Degradation Monitoring](#)
- [A Review of Publicly Available Geospatial Datasets and Indicators in Support of Drought Monitoring](#)
- [A Review of Publicly Available Geospatial Datasets and Indicators in Support of UNCCD Strategic Objective \(SO\) 2: To Improve Living Conditions of Populations Affected by Desertification, Land Degradation, and Drought](#)
- [Trends in Population Exposure to Land Degradation - Methodological note](#)
- [Arnold S., Jun C., Olav E. 2019. Global and Complementary \(Non-authoritative\) Geospatial Data for SDGs: Role and Utilisation. Report produced jointly by the Task Team on Global Data and Task Team on Alternative Data Sources by the Working Group on Geospatial Information of the Inter-agency and Expert Group on Sustainable Development Goal Indicators \(IAEG-SDGs\).](#)
- [Using Spectral Vegetation Indices to Measure Gross Primary Productivity as an Indicator of Land Degradation](#)
- [Evaluation of approaches for incorporating higher-resolution data for disaggregation or targeted analysis](#)
- [Disentangling the effects of climate and land use on land degradation](#)
- [Monitoring and assessing land degradation to support sustainable development](#)
- [\(French\) Suivre et évaluer la dégradation des terres pour soutenir le développement durable](#)
- [Comments on the GEF STAR Allocation Algorithm and Suggestions for Alternatives](#)