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Supplementary Material

Tab. S1 - Titles, spatial criteria observations, original criteria name, standardized criteria name, and reference to the evaluated papers.

Title	Criteria (n)	Criteria	Standardized Criteria	Reference
Identifying priority areas for Forest Landscape Restoration in Chiapas (Mexico): An operational approach combining ecological and socioeconomic criteria	8	• Distance from ecological corridors; • Distance from existing forest; • Distance from protected areas; • Tree species richness; • Distance from agricultural field; • Distance from roads; • Distance from urban areas; • Risk of soil erosion;	• Proximity to ecological corridors • Proximity to forest • Proximity to protected areas • Tree species richness • Distance from agriculture • Distance from roads • Distance from urban areas • Erosion risk	Orsi & Geneletti (2010)
Restauração Florestal Visando à Conservação de Recursos Hídricos por Meio da Combinação Linear Ponderada	4	• Proximity to hydrographic network; • Proximity to forest cover; • Slope; • Soil Erodibility.	• Proximity to drainage network • Proximity to forest • Slope • Soil Erodibility	Sartori et al., (2012a)
Combinação linear ponderada na definição de áreas prioritárias à conectividade entre fragmentos florestais em ambiente SIG	6	• Proximity to forest patches with large nuclear area; • Proximity to forest cover; • Proximity to hydrographic network; • Distance from urban areas; • Slope; • Soil Erodibility.	• Proximity to forest (nuclear area) • Proximity to forest • Proximity to drainage network • Distance from urban areas • Slope • Soil Erodibility	Sartori et al., (2012b)
Coupling Spatial Multiattribute Analysis and Optimization to Identify Reforestation Priority Areas	6	• Erosion; • Land use / land cover; • Position in the watershed; • Soil type; • Terrain slope; • Precipitation.	• Erosion • LULC • Proximity to drainage network • Soil class • Slope • Pluviosity	Cruz-Bello & Sotelo-Ruiz (2013)
Integrating stakeholder preferences and GIS-based multicriteria analysis to identify forest landscape	10	• Distance from crops; • Human density; • Distance from roads;	• Distance from agriculture • Population density	Uribe et al., (2014)

Title	Criteria (n)	Criteria	Standardized Criteria	Reference
restoration priorities		• Distance from urban; • Marginalization index; • Distance from forest; • Risk of erosion; • Slope of terrain; • Insolation; • Distance from rivers.	• Distance from roads • Distance from urban areas • Marginalization index • Proximity to forest • Erosion risk • Slope • Insolation • Proximity to drainage network	
Priority areas for forest restoration aiming at the conservation of water resources	5	• Land-use suitability; • Soil erodibility; • Erosivity; • Proximity to roads; • Proximity to water surface.	• Land use suitability • Soil Erodibility • Rain Erosivity • Distance from roads • Proximity to drainage network	Vettorazzi & Valente (2016)
Multicriteria Decision Analysis for Prioritizing Areas for Forest Restoration	2	• Proximity to drainage network; • Proximity to forest patches.	• Proximity to drainage network • Proximity to forest	Valente et al., (2017)
Improving identification of areas for ecological restoration for conservation by integrating USLE and MCDA in a GIS-environment: A pilot study in a priority region northern Mexico	3	• Bare soil; • Distance to roads; • Distance to town;	• Bare soil • Distance from roads • Distance from urban areas	Aguirre-Salado et al., (2017)
Dinámica de uso de suelo y sitios prioritarios para la restauración forestal del Corredor Biológico Río Tibás, Costa Rica	7	• Environmental fragility • LULC • Slope • Protected areas • Probability of LULC conversion • Infrastructure • Distance from roads	• Environmental fragility • LULC • Slope • Protected areas • Probability of LULC conversion • Infrastructure • Distance from roads	Calvo-Villalobos et al., (2018)
Mapping Priority Areas for Forest Recovery Using Miltricriteria Analysis in the Brazilian Atlantic	5	• Distance from the drainage network; • Distance from the native vegetation patches; • Slope; • Soil class; • Precipitation.	• Proximity to drainage network • Proximity to forest • Slope • Soil class • Pluviosity	De Almeida et al., (2019)
Identification of priority areas for ecological restoration in	5	• Natural erosion	• Erosion risk	Silva & Vieira (2020)

Title	Criteria (n)	Criteria	Standardized Criteria	Reference
Eastern Para, Brazil		vulnerability; • Potential land use and cover for restoration; • Proximity to the primary forest; • Forest cover deficit in PPA's; • Distance from roads and highways.	• Potential LULC for restoration • Proximity to forest • Forest cover deficit in PPA's • Distance from roads	
Análise multicritério na definição de áreas prioritárias para recuperação florestal na bacia do Rio Doce, em Minas Gerais	5	• Proximity to drainage network • Proximity to forest • Slope • Soil class • Pluviosity	• Proximity to drainage network • Proximity to forest • Slope • Soil class • Pluviosity	De Almeida et al., (2020)
Planning and prioritizing forest landscape restoration within megacities using the ordered weighted averaging operator	11	• Slope gradient; • Water quantity; • Water quality; • Forest cover; • Cropland cover; • Shrub cover; • Forest carbon stock; • Population density; • Proximity to township; • Annual income per capita; • Proportion of people employed in agriculture.	• Slope • Water quantity • Water quality • Forest cover • Cropland cover • Shrub cover • Forest carbon stock • Population density • Distance from urban areas • Annual income per capita • Proportion of people employed in agriculture	Li et al., (2020)
Priority areas for forest restoration aiming at the maintenance of water resources in a basin in the Cerrado/Amazon ecotone, Brazil	4	• Proximity to forest; • Slope; • Erodibility; • Proximity to surface water.	• Proximity to forest • Slope • Soil Erodibility • Proximity to drainage network	Lopes et al., (2020)
Spatial targeting approach for a payment for ecosystem services scheme in a peri-urban wellhead area in southeastern Brazil	7	• Proximity to surface water; • Proximity to forest patches; • Proximity among forest patches with larger core area; • Distance from urban areas; • Distance from roads; • Potential for aquifer contamination;	• Proximity to drainage network • Proximity to forest • Proximity to forest (nuclear area) • Distance from urban areas • Distance from roads • Potential aquifer contamination • Erosion	Souza et al., (2021)

Title	Criteria (n)	Criteria	Standardized Criteria	Reference
		• Accelerated erosion process.		
A multicriteria evaluation approach to set forest restoration priorities based on water ecosystem services	5	• Proximity to spring; • Slope; • Soil erodibility; • Topographic Wetness Index; • Land use and land cover.	• Proximity to springs • Slope • Soil Erodibility • Topographic Wetness Index • LULC	Valente et al., (2021)
Suggesting priority areas in the buffer zone of Serra do Brigadeiro State Park for forest restoration compensatory to bauxite mining in Southeast Brazil	5	• Permanent preservation areas; • Slope; • Land use and land cover; • Distance from conserved forest fragments; • Ecological corridors.	• Protected areas • Slope • LULC • Proximity to forest • Ecological corridors	Cosimo et al., (2021)
Method for classifying sites to Atlantic Rainforest restoration aiming to increase basin's streamflow's	3	• Annual average precipitation and potential evapotranspiration difference; • Water infiltration potential; • Topographic wetness index.	• Precipitation and potential evapotranspiration difference • Water infiltration potential • Topographic Wetness Index	Cecílio et al., (2021)
Prioritization in wildfire restoration using gis-based ordered weighted averaging (Owa): A case study in southern california	4	• Slope; • Soil Erodibility; • Proximity to forest cover; • Proximity to surface water.	• Slope • Soil Erodibility • Proximity to forest • Proximity to drainage network	Noth & Rinner (2021)
Multicriteria approach to prioritize forest restoration areas for biodiversity conservation in the eastern Amazon	4	• Forest connectivity; • Species potential distribution; • Mitigation of the impact of deforestation on streamflow; • Natural regeneration potential;	• Forest connectivity • Species potential distribution • Mitigation of the impact of deforestation on streamflow • Potential to natural regeneration	Cavalcante et al., (2022)
Remote Sensing-Based Land Suitability Analysis for Forest Restoration in Madagascar	5	• Distance from protected sites and forest patches; • LULC classes; • Distance from sattlements;	• Proximity to forest and protected sites • LULC • Distance from urban areas	Rajaonarivelo & Williams (2022)

Title	Criteria (n)	Criteria	Standardized Criteria	Reference
		• Distance from roads; • Risk of soil erosion.	• Distance from roads • Erosion risk	
A Geospatial Approach to Identify and Evaluate Ecological Restoration Sites in Post-Fire Landscapes	7	• Vegetation; • Soil class; • Differenced Normalized Burn Ratio (dNBR); • Aspect; • Compound Topographic Index (CTI); • Distance from settlements; • Distance from road network.	• Vegetation cover • Soil class • Differenced Normalized Burn Ratio (dNBR) • Aspect • Counpound Topographic Index (CTI) • Distance from urban areas • Distance from roads	Dosis et al., (2023)
Multi-Criteria Prioritization of Watersheds for Post-Fire Restoration Using GIS Tools and Google Earth Engine: A Case Study from the Department of Santa Cruz, Bolivia	14	• Macrowatersheds; • Microwatersheds; • Proximity to surface water; • Well density; • Precipitation; • LULC; • Elevation; • Slope; • Protected Areas; • Land Ownership; • Proximity to roads and infrastructure; • Population density; • Fire occurance; • Fire intensity.	• Macrowatersheds • Microwatersheds • Proximity to drainage network • Well density • Pluviosity • LULC • Elevation • Slope • Protected areas • Land Ownership • Distance from roads and Infrastructure • Population density • Fire occurance • Fire intensity	Fernandez et al., (2023)
Strategic landscape analysis relating multicriteria analysis and socioeconomic and environmental context to define potential areas for active restoration in São Paulo, Brazil	3	• LULC; • Slope; • Proximity to water.	• LULC • Slope • Proximity to drainage network	Mariano Ribeiro et al., (2023)

Tab. S2 - Spatial criteria classified by biophysical and socioeconomic categories for MCDA-based approaches to forest restoration.

Category	Spatial Criteria (*standardized*)	Occur-rences	Reference
Ecological	Ecological corridors	1	(Cosimo et al., 2021)
	Forest carbon stock	1	(Li et al., 2020)
	Forest connectivity	1	(Cavalcante et al., 2022)
	Forest cover	1	(Li et al., 2020)
	Proximity to ecological corridors	1	(Orsi & Geneletti, 2010)
	Proximity to forest	12	(Cosimo et al., 2021; De Almeida et al., 2019, 2020; Lopes et al., 2020; Noth & Rinner, 2021; Orsi & Geneletti, 2010; A. A. C. Sartori et al., 2012; A. A. da C. Sartori et al., 2012; Silva & Vieira, 2020; Souza et al., 2021; Uribe et al., 2014; Valente et al., 2017)
	Proximity to forest (nuclear area)	2	(A. A. da C. Sartori et al., 2012; Souza et al., 2021)
	Proximity to forest and protected sites	1	(Rajaonarivelo & Williams, 2022)
	Shrub cover	1	(Li et al., 2020)
	Species potential distribution	1	(Cavalcante et al., 2022)
	Tree species richness	1	(Orsi & Geneletti, 2010)
Climate	Precipitation and Potential Evapotranspiration Difference	1	(Cecílio et al., 2021)
	Precipitation	4	(Cruz-Bello & Sotelo-Ruiz, 2013; De Almeida et al., 2019, 2020; Fernandez et al., 2023)
	Rain Erosivity	1	(Vettorazzi & Valente, 2016)
Disturbance	Cropland Cover	1	Li et al. (2020)
	Differenced Normalized Burn Ratio (dNBR)	1	(Dosis et al., 2023)
	Distance From Agriculture	2	Orsi & Geneletti (2010), Uribe at al. (2014)
	Distance From Roads	9	(Aguirre-Salado et al., 2017; Calvo-Villalobos et al., 2018; Dosis et al., 2023; Orsi & Geneletti, 2010; Rajaonarivelo & Williams, 2022; Silva & Vieira, 2020; Souza et al., 2021; Uribe et al., 2014; Vettorazzi & Valente, 2016)
	Distance From Urban Areas	8	(Aguirre-Salado et al., 2017; Dosis et al., 2023; Li et al., 2020; Orsi & Geneletti, 2010; Rajaonarivelo & Williams, 2022; A. A. da C. Sartori et al., 2012; Souza et al., 2021; Uribe et al., 2014)
	Fire Intensity	1	(Fernandez et al., 2023)
	Fire Occurrence	1	(Fernandez et al., 2023)

	Infrastructure	1	(Calvo-Villalobos et al., 2018)
	Distance from roads and infrastructure	1	(Fernandez et al., 2023)
Soil / Erosion	Bare Soil	1	Aguirre-Salado et al. (2017)
	Environmental Fragility	1	(Calvo-Villalobos et al., 2018)
	Erosion	2	(Cruz-Bello & Sotelo-Ruiz, 2013; Souza et al., 2021)
	Erosion Risk	4	(Orsi & Geneletti, 2010; Rajaonarivelo & Williams, 2022; Silva & Vieira, 2020; Uribe et al., 2014)
	Soil Class	4	(Cruz-Bello & Sotelo-Ruiz, 2013; De Almeida et al., 2019, 2020; Dosis et al., 2023)
	Soil Erodibility	6	(Lopes et al., 2020; Noth & Rinner, 2021; A. A. C. Sartori et al., 2012; A. A. da C. Sartori et al., 2012; Valente et al., 2021; Vettorazzi & Valente, 2016)
Land Use and Land Cover	Land Use Suitability	1	(Vettorazzi & Valente, 2016)
	LULC	7	(Calvo-Villalobos et al., 2018; Cosimo et al., 2021; Cruz-Bello & Sotelo-Ruiz, 2013; Fernandez et al., 2023; Mariano Ribeiro et al., 2023; Rajaonarivelo & Williams, 2022; Valente et al., 2021)
	Potential LULC for restoration	1	(Silva & Vieira, 2020)
	Potential LULC to natural regeneration	1	(Cavalcante et al., 2022)
	Probability of LULC conversion	1	(Calvo-Villalobos et al., 2018)
Protected Areas	Protected Areas	3	(Calvo-Villalobos et al., 2018; Cosimo et al., 2021; Fernandez et al., 2023)
	Forest cover deficit in protected areas	1	(Silva & Vieira, 2020)
	Proximity to Protected Areas	1	Orsi & Geneletti (2010)
Topography	Aspect	1	(Dosis et al., 2023)
	Counpound Topographic Index	1	(Dosis et al., 2023)
	Elevation	1	(Fernandez et al., 2023)
	Insolation	1	(Uribe et al., 2014)
	Slope	14	(Calvo-Villalobos et al., 2018; Cosimo et al., 2021; Cruz-Bello & Sotelo-Ruiz, 2013; De Almeida et al., 2019, 2020; Fernandez et al., 2023; Li et al., 2020; Lopes et al., 2020; Mariano Ribeiro et al., 2023; Noth & Rinner, 2021; A. A. C. Sartori et al., 2012; A. A. da C. Sartori et al., 2012; Uribe et al., 2014; Valente et al., 2021)
	Topographic Wetness Index (TWI)	2	(Cecílio et al., 2021; Valente et al., 2021)
Water	Macrowatersheds	1	(Fernandez et al., 2023)
	Microwatersheds	1	(Fernandez et al., 2023)

	Mitigation of the impact of deforestation on streamflow	1	(Cavalcante et al., 2022)
	Potential Aquifer Contamination	1	(Souza et al., 2021)
	Proximity to Drainage Network	13	(Cruz-Bello & Sotelo-Ruiz, 2013; De Almeida et al., 2019, 2020; Fernandez et al., 2023; Lopes et al., 2020; Mariano Ribeiro et al., 2023; Noth & Rinner, 2021; A. A. C. Sartori et al., 2012; A. A. da C. Sartori et al., 2012; Souza et al., 2021; Uribe et al., 2014; Valente et al., 2017; Vettorazzi & Valente, 2016)
	Proximity to Springs	1	(Valente et al., 2021)
	Water Infiltration Potential	1	(Cecílio et al., 2021)
	Water Quality	1	(Li et al., 2020)
	Water Quantity	1	(Li et al., 2020)
	Well density	1	(Fernandez et al., 2023)
Socioeconomic	Annual Income per capita	1	(Li et al., 2020)
	Land Ownership	1	(Fernandez et al., 2023)
	Marginalization Index	1	(Uribe et al., 2014)
	Population Density	3	(Fernandez et al., 2023; Li et al., 2020; Uribe et al., 2014)
	Proportion of People Employed in Agriculture	1	(Li et al., 2020)

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