Evidence-based decision-making for Life on Land

COP15  May 13th 1-3 pm
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>1:00 p.m.</td>
<td>Welcome and Introduction</td>
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<td>Ermias Betermariam</td>
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<tr>
<td>1:10 p.m.</td>
<td>Thematic opening: Sciene-Policy-Interface (SPI) Report</td>
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<td>Peter Verburg</td>
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<td>1:20 p.m.</td>
<td>Thematic Group: Tools and Data for ILUP</td>
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<td>LUP4LDN</td>
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<td>Pythagoras Karampiperis</td>
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<td>1:30 p.m.</td>
<td>Impact forecasting in the LP context</td>
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<td>Catherine Chamberlin</td>
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<td>1:40 p.m.</td>
<td>FAO’s LRP toolbox and updated LUP guidelines</td>
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<td>Feras Ziadat</td>
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<td>1:50 p.m.</td>
<td>GEO-LDN: Towards an interoperable portfolio of tools</td>
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<td>Alex Zvoleff</td>
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<td>1:55 p.m.</td>
<td>Panel discussion: Country perspectives</td>
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<td>Rafla Attia</td>
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<td>Vera Boerger</td>
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<td>2:20 p.m.</td>
<td>Thematic Group: Networking opportunities and outlook</td>
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<td>S4ILUP Teaser and enabling environment survey</td>
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<td>Antje Hecheltjen</td>
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<td>2:30 p.m.</td>
<td>GEF Enabling Activity Project on integrating LDN into LUP</td>
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<td>Pedro Lara Almuedo</td>
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<tr>
<td>2:35 p.m.</td>
<td>Closing: Discussion and Q&amp;A</td>
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**Evidence-based decision-making for *Life on Land!***

**Scenarios for Integrated Land Use Planning**
Thematic opening: Science-Policy-Interface (SPI) Report

Prof. Dr. Peter H. Verburg
Member Science-Policy Interface UNCCD

- Professor Environmental Geography at VU University Amsterdam
- Visiting professor at Swiss Federal Institute for Forest, Snow and Landscape Research
- Expertise: Land Use Change, Interdisciplinary Analysis and Modelling of Land Use and Socio-Ecological Systems
Tools and Data for Integrated Land Use Planning towards well-informed planning practice

-UNCCD Science-Policy Interface-

Peter Verburg

Abidjan, Côte d’Ivoire
13 May 2022
Current Planning Practice

• Mostly sectoral, focused on urban, economic and transport development

• Often separated from environment and agricultural planning

• Based on planning experts and (some) stakeholder engagement

• Potential for ineffectiveness, land degradation and conflict
National sustainability targets: implementation gap

CHALLENGE: implementation of policy targets (including LDN)

- National
- District / provincial
- Watershed
- Community

Integrated Land Use Planning  Integrated Landscape Management
Integration of LDN in planning

LDN integration can avoid (net) degradation due to development planning.

**ILUP and ILM have integral roles to play in achieving LDN and reducing decision uncertainties associated with planning for neutrality.**
LDN can connect to different phases of land use planning.
Recommendations (1)

• Strengthen role of land use planning in implementation of sustainability targets and reconciliation of competing claims on land
• Embedding LDN in land use planning

**ILUP and ILM are a vehicle to create synergies and policy coherence (e.g., among the three Rio conventions)**

**ILUP and ILM enable just solutions, increasing gender equity & avoiding social conflicts**
Differences in planning systems
- Horizontal and vertical integration needed

⇒ Complex problems requiring tools and data
⇒ Different tools for different planning systems/context
⇒ Portfolio of tools required
Planning processes need to be well-informed

Tools and approaches
- Indicator-assessment
- Forward-looking
- Multi-criteria analysis
- Optimization
- Rapid-appraisal
- Process-oriented
Planning processes need to be well-informed

Planning for the future:
- Foreseeing change
- Anticipating challenges
- Avoiding conflict
- Deal with uncertainty
Elements of land planning systems

Relevant tool characteristics

Scale of decision-making the tool operates at

Direction of governance the tool addresses

Direction of governance the tool addresses

Level of stakeholders that can be involved

Level of stakeholders that can be involved

Tenure types that can be accounted for

Complexity of LUP that the tool can handle
## 1. Baseline year assessment (land degradation & drivers) & Monitoring

<table>
<thead>
<tr>
<th>Decision making scale</th>
<th>Decision making direction</th>
<th>Stakeholder involvement</th>
<th>Methodologies</th>
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<tr>
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<td>LADA Questionnaire</td>
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<td>Trends.Earth validated with Transect walks</td>
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<td>Trends.Earth, Desertification Vulnerability index</td>
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### 3. Stakeholder negotiations for LDN integration

<table>
<thead>
<tr>
<th>Decision making scale</th>
<th>Complexity of LUP scope and focus</th>
<th>Decision making direction</th>
<th>Different land tenure types</th>
<th>Tools</th>
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<td>Multi-criteria-analysis + Process-oriented tools</td>
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<td>National</td>
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<td>Multi-criteria-analysis + STDM</td>
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<td>Optimization tools</td>
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- **Multi-criteria-analysis**
- **Process-oriented tools**
- **Optimization tools**
- **STDM**
## 2. Planning for neutrality

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<th>Decision making scale</th>
<th>Complexity of LUP scope and focus</th>
<th>Decision making direction</th>
<th>Stakeholder involvement</th>
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<td><strong>CLUMondo + Participatory scenario analysis</strong></td>
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<td><strong>CLUMondo + Erosion model</strong></td>
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Recommendations (2)

• **Capacity** for land use planning and **learning** from experience
• Use of **tools** for informing land use planning and LDN integration
• No tool can do everything, **all tools are ‘imperfect’**
• **Collaboration** between academic/research practitioner communities:
  ➔ Tools require scientist to apply and interpret properly, they are not ‘answering machines’
• **Generation and sharing** of experience, data, approaches and tools to support ILUP and ILM to achieve LDN
Thank you!

https://www.unccd.int/resources/reports/contribution-integrated-land-use-planning-and-integrated-landscape-management
Thematic Group: Tools and Data for ILUP

1:20 – 1:55 p.m.
Pythagoras Karampiperis
Founder and CEO of SCiO

- More than 25 years of expertise in the conception, coordination and realization of R&D projects in cooperation with industry, research and international organizations on ways in which artificial intelligence technologies may be used to tackle key challenges of the agri-food value chain.

- One of SCiO’s key achievements is their work for the Big Data Platform of CGIAR, a large-scale initiative to unlock important research publications and data sets about food security, nutrition, and natural resources.
LUP4LDN
User-Centered Geoinformatics Land Use Planning for LDN

Pythagoras Karampiperis  
CEO, SCio
& LUP4LDN Team
Our team

Team Leader
Dr. Pythagoras Karampiperis
CEO, SCiO

sub-National Stakeholder Representatives
Attia Rafla
Directorate of Soil Resources
Ministry of Agriculture, Hydraulic Resources and Maritime Fisheries, Tunisia

Taoufik Hermassi
National Institute of Research on Rural Engineering, Water, Forest (INRGRREF), Tunisia

Boundia A. Thiombiano
Institute for Rural Development (IRD), Université Nazi BONI, Burkina Faso

Moussa Savadogo
Permanent Secretariat for the Coordination of Agricultural Sector Policies, Ministry of Agriculture, Burkina Faso

Zoumbé Koura
Permanent Secretariat of the National Council for Sustainable Development, Ministry of Environment, Burkina Faso

International Collaborators
Quang Bao Le
Senior Research Scientist, International Center for Agricultural Research in the Dry Areas (ICARDA)

Enrico Bonaiuti
Research Team Leader for Monitoring, Evaluation and Learning Unit, International Center for Agricultural Research in the Dry Areas (ICARDA)

Tatenda Lemann
Senior Research Scientist, World Overview of Conservation Approaches and Technologies (WOCAT)

Claudio Zucca
Scientist, Department of Agricultural Sciences University of Sassari (UNISS)

Richard Thomas
Scientific Coordinator, Economics of Land Degradation (ELD) Initiative
WHERE

to undertake efforts to avoid, reduce, or revert land degradation to achieve neutrality?

HOW

to identify the best context-relevant Sustainable Land Management (SLM) practices?

Target Users

Land use planners, national and sub-national organizations active in LU/LM planning, policy makers, land users and research agencies.
LUP4LDN User Journey

**LUP key steps**

- **LDN problem definition**
  - Spatialexplicit past/current LD and new LD

- **Land use suitability**
  - Robust socio-ecological context driving LU/LM adoption & performance

- **Opportunities for LU/LM change**
  - Availability of local/regional context-relevant LU/LM options

- **LU/LM alternatives**
  - Short-list of potentially promising LU/LM options per context typology

- **LU/LM transition trajectories**
  - Optimal, feasible LU/LM change trajectories towards achieving LDN target

- **LUP consolidation**
  - LUP visualisation (key steps & end-points) for broader stakeholders

**LUP4LDN Supporting Functionality**

- Map past LD hotspots

- Map current LU/LM types that would cause potentially new LD

- Map & characterize socio-ecological context types

- Query all LU/LM options vs socio-ecological context types

- Rank LU/LM options within each context typology (upon impact indicators)

- LU/LM transition matrix generation using the ranked LU/LM options

- Ex-ante plot impact indicators per LU/LM transition trajectory

**LUP Planner(s)**

**LUP Supporter(s)**
Pilots for LUP4LDN Validation

▪ Tunisia

Local Pilot Partner(s):
  ▪ National Institute for Research in Rural Engineering, Water and Forests (INRGREF)
  ▪ Soil Resources Department, Directorate General for the Conservation and Management of Agricultural Lands (DGACTA), Minister of Agriculture, Water Resources and Maritime Fisheries

▪ Burkina Faso

Local Pilot Partner(s):
  ▪ Institute for Rural Development, Université Nazi Boni (IDR-UNB)
LUP4LDN at a glance

Key Features

Computation of anticipated future LD based on the SDG15.3.1 indicators
LUP4LDN at a glance

Key Features

Helps users formulate land use transition scenarios
LUP4LDN at a glance

Key Features

Integrates stakeholder knowledge to LU system assessment, and SLM selection from WOCAT
LUP4LDN at a glance

Key Features

Generation of Neutrality matrix/map for the examined scenarios
How does LUP4LDN work?

1. **LDN Problem Definition**
   - Spatially-explicit past/current LD and new LD

2. **Land Use Suitability**
   - Robust socio-ecological context driving LU/LM adoption & performance

3. **Opportunities for LU/LM Change**
   - Availability of local/regional context-relevant LU/LM options

4. **LU/LM Alternatives**
   - Short-list of potentially promising LU/LM options per context typology

5. **LU/LM Transition Trajectories**
   - Optimal, feasible LU/LM change trajectories towards achieving LDN target

6. **LUP Consolidation**
   - LUP visualisation (key steps & end-points) for broader stakeholders

---

**LUP4LDN Supporting Functionality**

- **TRENDS.EARTH**
  - Trends.Earth
- **GeOC tool**
  - Contextual similarity
- **WOCAT**
  - LUP4LDN query engine in WOCAT database
- **ELD**
  - SLM impacts & ELD data

**Stakeholder Sustainability Evaluation**

- **Past & Current LD**
- **Sustainability criteria & indicators**

**LUP Scenarios**

- Reverse and reduce current LD via SLM by CSU
- Avoid new net LD via SLM by CSU

**LUP4LDN Scenario Builder**

- LUP4LDN impact of LU/LM transitions (maps & spider diagrams)

**LDN-Optimized LUP Scenario**
LUP4LDN is a tool that greatly helps us to understand where to focus restoration activities and design scenarios for reducing land degradation.

Mrs. Attia Rafla  
Ministry of Agriculture, Tunisia

Thank You

Pythagoras Karampiperis  
pythagoras@scio.systems

www.scio.systems
Catherine Chamberlain  
*Postdoctoral Associate – Impact Forecasting*

- Cat is an ecologist and climate scientist interested in advancing community knowledge in environmental research, habitat restoration, and climate justice.

- She is assessing the current and projected return on investments from conservation interventions on climate change mitigation, biodiversity conservation, and socioeconomic benefits.

- Cat received her PhD from Harvard University where she studied the effects of climate change on the intensity and frequency of late spring freezing events and her MSc from Trinity College Dublin in Biodiversity and Conservation.
IMPACT FORECASTING IN LAND USE PLANNING

Cat Chamberlain | Postdoctoral Associate – Impact Forecasting
Natural Climate Solutions (NCS)

Griscom et al., 2019, Glob Change Biol

SUSTAINABLE LAND MANAGE (SLM) PRACTICES

Cowie et al., 2018, Env Sci & Pol
Targeting Land-use & Land-cover Interventions

Funding actions that enact change

Aspects that influence funding e.g. governance

Land use patterns & changes

BIODIVERSITY
  e.g., STAR metric

CLIMATE SOLUTIONS
  e.g., forest cover change

SOCIOECONOMICS
  e.g., Human Development Index (HDI)
Data sources

• AidData from William and Mary
  • Global Environmental Facility (GEF)
• CEPF
• eConservation
• Coming soon: Restor from Crowther Lab

*Currently reaching out to other funders to enhance model output
Data format
Parameters In Model

Details on Intervention
- Intervention type (e.g., Avoid, Reduce, Reverse with habitat)
- Years of intervention
- Investment/costs of intervention
- Drought index

Climatic Variables
- Rate of change of drought
- Mean spring temperature
- Rate of change in temperature

Site information
- Elevation
- Slope
- Protected areas in ADM2
- Number of roads in ADM2
- Population*

*Missing Population data before 2000 so removing from most models
Intervention Return on Investment (ROI)

Rate of forest cover change vs. Years of project
- manage agriculture (reduce)
- manage forest (reduce)
- protect forest (avoid)
- protect wetland (avoid)
- restore forest (reverse)

Rate of forest cover change vs. Investment ($ millions)
- manage agriculture (reduce)
- manage forest (reduce)
- protect forest (avoid)
- protect wetland (avoid)
- restore forest (reverse)
Developed shiny app tool

Estimating conservation investment impact on climate change outcomes

To progress investments in nature, forecasting impact is essential to effectively implement new conservation strategies. In this Shiny App, we provide a tool where users can consider how conservation investments and various interventions impact climate change mitigation. We consider the impacts of various actions on the rate of forest cover change throughout Brazil based on ten major indicators: 1) years of project, 2) accumulated investment, 3) number of roads, 4) protected areas, 5) Palmer Drought Severity Index (PDSI), 6) rate of change in PDSI, 7) mean spring temperature, 8) rate of change in mean spring temperature, 9) elevation and 10) slope.

** https://forecastingconservation.shinyapps.io/cop15app/
Evaluating project impact

Rate of natural land cover change

Parameter breakdown
Palmer Drought Severity Index (PDSI)

Darker lines represent the intervention, lighter lines are control

- Manage agriculture (Reduce)
- Manage forest (Reduce)
- Protect forest (Avoid)
- Protect wetland (Avoid)
- Restore forest (Reverse)
Forecasting by user input
**Disclaimer**

- The Shiny App is publicly available, though **we do not recommend** you use this tool for decision-making at this time.
- We are still developing the base models, rigorously testing accuracy, improving forecasts, and enhancing model output.
- Currently, the model is reporting **large amounts of uncertainty**. We would like to add data to the base model before encouraging widespread use.
Future directions

• Integrate biodiversity conservation and socioeconomic benefits into the tool
• Expand forecasts to include habitat level information across SLMs
• Hope to combine all three outcomes to determine overlap
• Continue to add to base models to improve forecasts
• Begin to extend globally
THANK YOU
Feras Ziadat

*Land and Water Officer at FAO*

- Currently coordinating the FAO flagship report “The State of the World’s Land and Water Resources for Food and Agriculture – SOLAW”, and the Chair of the UN Coalition on Combating Sand and Dust Storms

- Focusing on land resources planning tools and approaches to support integrated land and water management, participatory land use planning, combating land degradation and desertification, integrated landscape management and sustainable land management
Evidence-based decision making for Life on Land Scenarios for Integrated Land Use Planning

Land Use Planning Guidelines and Toolbox

Feras Ziadat
Land and Water Division, FAO
LUP to answer the question:
What is the best use and management for any land?

Land incorporate:

- Soil and terrain forms
- Plant and livestock
  (forests, rangelands, rainfed & irrigated, arable land, genetic resources)
- Water
  Surface hydrology and groundwater
- Climate
- Human activities
- Tenure rights
  Formal & Informal
- Human settlement pattern

Because we all use the land resources.

everybody should be concerned about land use planning

Shocks/emerging issues
- Climate change
- Drought
- COVID recovery
- Restoration
A scientific evidence-based approach is crucial to develop, test, implement and scale-out sound and acceptable SLM options.

From degradation and vulnerability to sustainability through proper land use and sustainable land management

The role of land resources planning

Source: FAO, 2017
Three scales of Land use planning:
National, District, Local

At this scale a **national development plan** is needed to identify major landuse systems. It will be used mainly to inform national policies.

At this scale planning should be **less general**, and should consider specific **district level problems and opportunities** and inform district policies and priorities.

At this scale, a **detailed land-use plan** should be formulated for the specific land uses and associated management options. It should consider land users’ specific problems, needs and capacities.

The three scales are **interrelated**, and a two-way **information flow** should be maintained.

Multi-sectoral
Integrated
Participatory
Four interlinked steps for land resources planning and management:
Assessment, Planning, implementation/Scaling out and Monitoring
Stocktaking of needs and issues for updating land use planning tools

Implement a stakeholders survey to identify gaps, opportunities and the way forward to support land restoration and sustainable management. Targeting range of stakeholders operating at: Different levels and covering multi-institutions Sectors, disciplines and regions in six languages returned by 747 respondents.
To close the **knowledge gap** about the tools and approaches available for guiding LRP processes

An inventory of existing tools with additional input from the survey was compiled to establish the **Land Resources Planning Toolbox**

Can help decision-makers and land users **put sustainable land management into practice**
The LRP TOOLBOX

Search criteria and options for the Land Resources Planning Toolbox

MAIN CATEGORIES
- Biophysical approaches/tools
- Socio-economic/negotiated approaches tools
- Integrated biophysical and socio-economic/negotiated approaches/tools
- Databases/information systems
- Support tools

SUB CATEGORIES
- Land Evaluation
  - Agroecological Zoning and derived tools
  - Soil Productivity Indices
  - Software/Applications Land Resources Planning
- Farm systems
  - Gender
  - Governance/tenure
  - Household surveys
  - Participatory/negotiated approaches
- Rural appraisal
  - Spatial planning (Urban/Rural)
  - Territorial development/sustainable land management
- Soil databases
  - Land degradation databases
  - Climate data bases
  - Statistics data bases
  - Crop databases
- Assessment and mapping tools: Land, soil, crop, water
- Assessment and mapping tools: climate
- Other support tools

More tools are continuously uploaded to the toolbox
You may add tools/approaches as well
Using the LRP TOOLBOX

There are three main ways of using the toolbox:

1. Browse the content in each of the five main categories
2. Free text search
3. Guided search using filters

Biophysical approaches/tools
- Sustainable Land Management
- Land assessment & impacts
- Land governance and planning
  - Land Policy
  - Land resources planning
  - Land Resources Planning Toolbox
- LDR - Restoring degraded lands
- Soils

Integrated biophysical and socio-economic/negotiated approaches/tools

Socio-economic/negotiated approaches tools

Databases/Information systems

Support tools

LRP-TOOLBOX

Land & Water

Land Resources Planning Toolbox

- Restoration

More search options

Category: select
Sub-Category: No items in list
Scale
Type
Thematic area
User Category

THEMATIC AREAS
- Agriculture, statistics
- Agriculture, productivity
- Cadaster
- Climate
- Crops, distribution
- Crops, productivity
- Crops, suitability
- Economy, statistics
- Environment, statistics
- Farming systems
- Food, statistics
- Forestry, statistics
- General
- Land degradation
- Land evaluation
- Land management/planning
- Land/water rights
- Land/cover
- Population, distribution
- Population, statistics
- Remote sensing
- Social participatory approaches
- Social, statistics
- Soils, distribution and properties
- Soils, management and conservation
- Water, productivity
- Water, statistics

TYPE OF TOOL
- Data
- Documentation/manuals
- Educational materials
- Framework/guidelines
- Maps/GIS
- Model
- Questionnaire/survey
- Software

SCALE/APPLICABILITY
- Global
- Regional
- National
- Subnational/province/district
- Watershed/basin/landscape
- Locality/farm/site

USER CATEGORY
- Technical specialist
- Scientific adviser
- Modeler
- Policy maker/Planner
- Facilitator
- Stakeholder
How can we achieve more effective LUP?

1. Biophysical, socio-economic, environmental and governance assessment (inc. tenure)
2. Land suitability assessment
3. Negotiation process to select best option(s) and minimize conflicts
4. Implementation and continuous monitoring and fine-tuning

Do we have proper tools, approaches and methodologies?

Updating the LUP Guidelines
Thank you!

Land resource planning for sustainable land management
English https://www.fao.org/3/i5937e/i5937e.pdf

Land Resources Planning Toolbox

www.fao.org/land-water
Twitter: @FAOLandWater          contact: feras.ziadat@fao.org
Alex Zvoleff
Senior Director of Resilience Science at Conservation International, Member of the GEO-LDN Initiative

- Alex leads the Resilience Team within the Moore Center, focusing on modeling and development of demand driven tools to improve the understanding of the role of nature in supporting resilience to climate change

- Alex’s work integrates large interdisciplinary datasets to study interactions among climate, land use and land cover change, and human-wellbeing, while ensuring the best possible information is available, and accessible by non-expert audiences, to inform conservation decisions
LAND DEGRADATION NEUTRALITY

Alex Zvoleff, Conservation International
Geo LDN Steering committee

Management and functional support Unit

Capacity Building Working Group

Data Quality Standards Working Group

Data Analytics Group
GEO LDN Data Analytics Working Group (Working Group 3)

• Ambition of WG3 is to provide a suite of interoperable geospatial datasets and analytical tools
  o To measure and monitor land degradation
  o To enable planning to achieve LDN at scales from local to regional

• Development of tools and standards must be user-oriented, and accompany aligned capacity building
A portfolio of tools are needed to support achieving LDN

- Data analysis needs vary depending on the decision context
- For example, in ILUP:
  - Different phases have different requirements
  - Varying needs depending on top-down vs bottom-up, stakeholder involvement, etc.
GEO LDN has a key role to play in building this portfolio

• Data analytics group is focused on
  o Working with users to understand needs and challenges to be addressed
  o Enabling new and existing tools to work together (interoperability)
  o Addressing challenge of reproducibility (different methods for same indicator, different code for same method, with differing results)
  o Strategically addressing gaps in existing tools (i.e. LUP4LDN) where identified

• Upcoming activities in support of portfolio development
  o Review of existing data systems and tools (building on prior work)
  o Defining technical and content standards
  o Focused development of new modules/tools where gaps are identified
  o Linkage with ongoing capacity building activities within GEO LDN
Panel discussion: Country perspectives | 1:55 – 2:20 p.m.
Panel discussion: Country perspectives  |  1:55 – 2:20 p.m.

Discussion Questions:

How can such ILUP tools and data support LUP in your countries?
Are there efforts to share data and tools among different levels of government and sectors involved in LUP?
What do you need to successfully mainstream the tools into policies, planning/implementation?
Country perspective Tunisia

Rafla Attia
Director of Soil Resources - General Directorate Development and Conservation for Agricultural Land Restoration DGACTA - Ministry of Agriculture Tunisia

• 2020-2024 Coordinator sustainable management of vulnerable natural resources program in the Framework of «The Climate Change Adaptation Program in Tunisian Vulnerable Territories Project (PACTE)» contributing to the sustainable development and adaptation to climate change of vulnerable rural territories.

• 2020-2022 Tunisia Focal Point FAO’s Technical Cooperation Programme TCP/RAB/3802 «Capacity development for the sustainable management of soil resources in the NENA region to achieve the Sustainable Development Goals (SDGs)»
LAND USE PLANNING FOR LAND DEGRADATION
NEUTRALITY (LUP4LDN) TOOL perspectives in Tunisia

Attia Rafla: Soil Director DGACTA
&
Hermassi Taoufik: Researcher INERGREF

Tunisia
Tunisian End-Users: key actors in LUP for LDN

Hamda Aloui
UNCCD focal point in Tunisia
Sub-director
General Directorate of Sustainable Development, Ministry of Environment

Attia Rafila
Director
Directorate of Soil Resources
Ministry of Agriculture, Hydraulic Resources and Maritime Fisheries
Tunisia

Taoufik Hermassi
Expert
National Institute of Research on Rural Engineering, Water, Forest (INRGREF), Tunisia

Issam Anatar
DG
General Directorate of Agricultural land management and Conservation (DGACTA), Ministry Agriculture

Representing Legal LUP planners

Representing Science-based LUP supporters

Other key Legal LUP planners
The assessment of the state of land degradation in Tunisia indicates that for the period 2000-2010, the total area of degraded land is estimated at around 1.6 million ha equivalent to a degradation 10% per year nationally.

Faced with the serious situation of land degradation, it becomes urgent to take adequate measures to reverse the trend and achieve land degradation neutrality LDN at the 2030 horizon.

To achieve the identified national LDN targets, a set of technical and political measures are envisaged according to the principle of the hierarchy of responses of the NDT process, namely avoid reduce-restore.
In Tunisia activities related to LDN are coordinated by a National Desertification Council (CND), with the participation of several institutional and civil society actors at different levels, including the Directorate of Soil Resources.

In our mission, we have a constant need of developing and validating LU and LM change scenarios at different administrative levels and evaluate their contribution to the country’s LDN targets. As such, we need tools that answer the key questions of where is most crucial to focus, and what scenarios are preferrable.

LUP4LDN allows the integration of stakeholder knowledge into the decision flow and the identification of best-suited SLM practices and generates visual outputs for data evidence, which we need to compare and communicate impact of land use scenarios and inform policy making.

Another major advantage of LUP4LDN is its participatory nature, which supports the social dialogue among relevant stakeholders at all levels. and enables them to jointly design and adopt LU and LM scenarios.

In our opinion, the further development of the tool should focus on:
first, the ability to prioritize assessment criteria for different LM approaches based on the different priorities of local communities;
second, the ability to upload and use data produced by our Ministry; and
third, the ability to integrate more detailed LU and LC maps than the ones used by Trends.Earth

LU = LAND USE; LC = LAND COVER; LM = LAND MANAGEMENT
Stakeholder trade-off: spatial optimization of gains and losses

LDN optimized LU planning scenario

LUP scenarios defined by Stakeholder
For a RoI and related maps, and diagrams

“PAST” LD as defined by Trends.Earth

Anticipated NEW LD at time x by Stakeholder
(sustainability of current use of land)

Context-relevant SLM
Based on Contextual Similarity Units (CSU) by GeOC tool and WOCAT
Session 1. Review of the first workshop results, and Users’ expectations

1. User journey
   Outputs from *WSH1 Session 4.1: Participatory review of user journey map*

2. SH’s expectations

3. Data for tool testing in Tunisian case study.
   Outputs from *WSH1 Session 4.2: Reviewing data need and availability*
1. **User journey**  
Outputs from *WSH1 Session 4.1: Participatory review of user journey map*

Result of WG (raw)

<table>
<thead>
<tr>
<th>LUP phase</th>
<th>Admin</th>
<th>Need</th>
<th>Challenge</th>
<th>Target planning action</th>
<th>Tool product envisioned (SHs wish the tool to provide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of LU map</td>
<td>Min Agric; Min State domain; Min Enviro Min Interior; Min Equip; Min Def</td>
<td>Improve the existing LU map</td>
<td>Scale; Updated map (dynamic); Coordination</td>
<td>Updated and precise LU map</td>
<td>Reliable and consolidated LU map</td>
</tr>
<tr>
<td>Clarify LU classification system (maps)</td>
<td>Min Agric; Min Enviro Min Interior; Min Equip; Min Def</td>
<td>Choice of LU classes / institution</td>
<td>Harmonization of LU classes / institution</td>
<td>Harmonized LU classes</td>
<td>National LU classes lined up to the international classes</td>
</tr>
<tr>
<td>Situation Diagnostic (crop land, for what land use, identify stockholders)</td>
<td>CNCT; DGACTA; DGF OEP; DGPA; DGEDA; CRDA; AFA; DGAFJ</td>
<td>Specify details of LU systems (homogeneous units) Statistics tools</td>
<td>Coordination for identifying and collecting available information</td>
<td>Diagnostic reporting</td>
<td>Reliable database</td>
</tr>
<tr>
<td>Elaborating data on existing and best-bet crop allocation; knowledge/Evidence on benefits from envisioned SLM practices to be implemented/out-scaled</td>
<td>CNCT; DGACTA; DGF; OEP; CRDA; AFA; Governorates/Municipalities;</td>
<td>Access to data Quality of data; Sources of data</td>
<td>Database collection</td>
<td>Accessible and detailed National Database; Priority action sites identified by Programs/ projects, by governmental bodies or by donors (linkage to multiple policy targets)</td>
<td>Soil suitability / soils cropping aptitude maps</td>
</tr>
</tbody>
</table>
### 1. User journey (continued)

Outs from *WSH1 Session 4.1: Participatory review of user journey map*

<table>
<thead>
<tr>
<th>LUP phase</th>
<th>Admin</th>
<th>Need</th>
<th>Challenge</th>
<th>Target planning action</th>
<th>Tool product envisioned (SHs wish the tool to provide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validation process</td>
<td>CNCT; DGACTA; DG; OEP; DGPA; DGEDA; CRDA; AFA; DGAFJ; Research Institutes; NGO’s</td>
<td>Ground truth Local / Stakeholders participation; Expert evaluation Validation approach</td>
<td>Acceptability politico-socio-economic Reality reflection</td>
<td>Definition of validation protocol standards</td>
<td>Validation standards protocol</td>
</tr>
<tr>
<td>Scenarios / goals /Evaluate planning scenario</td>
<td>CNCT; DGACTA; DG; OEP; DGPA; DGEDA; ONG’s</td>
<td>Determination of goals; Natural resources Productivity et conservation</td>
<td>Acceptability politico-socio-economic; Evaluation soil suitability / cropping aptitude of the soils; Natural resources conservations; Rentability/productivity</td>
<td>Choice of the most suitable scenario</td>
<td>Federator Scenario (selecting suitable scenarios based on comparisons of their impacts)</td>
</tr>
<tr>
<td>Select relevant solutions</td>
<td>CNCT; DGACTA; DG; OEP; DGPA; DGEDA; CRDA; AFA; DGAFJ; Research Institutes NGO’s</td>
<td>Best indicator to evaluate solutions</td>
<td>Adaptation of solution / Prioritization</td>
<td>Prioritization of the best solution</td>
<td>Consolidated suitable LUP map</td>
</tr>
<tr>
<td>Different policies planning/targets</td>
<td>Min Agri; Min Envr; Governorates;</td>
<td>Identifying indicators; Strategies by actor/administration; Funds</td>
<td>Harmonize national objectives with international indicators</td>
<td>Harmonized national strategy of natural resources management</td>
<td>National Strategy of natural resources management and LDN</td>
</tr>
</tbody>
</table>
2. SH’s expectations: additional recommendations

Data input:
- Principle for integrating multi-criteria LD indicators (one out – all out)
- Data quality (garbage in – garbage out)
- Specific to indicating LD in national and local scale
- Relevant (content, timing, spatial scale/resolution)

Knowledge input:
- Capacities in LUP and in LDN;
- Field reality (e.g., know where SLM already implemented)
- Tool cannot replace direct field understanding, e.g., input from extension system

Operational:
- Clarity of transition matrix (need to develop understating on implications from assigning values ES impact of particular LU-LM transitions)
### Summary of input data needed by LUP4LDN

<table>
<thead>
<tr>
<th>Input data categories</th>
<th>Default (by tool)</th>
<th>By User</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For Baseline/Past and New LD:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Baseline/past LD</td>
<td>SDG15.3.1 sub-indicators (3) and combined indicator (Trends.Earth), global, 2000-2015 series</td>
<td>Optional</td>
</tr>
<tr>
<td>- LU Suitability (for calculating new LD)</td>
<td>FGGD (FAO, 2007), for broad agri. LU classes, global, res. 10 km</td>
<td>Local</td>
</tr>
<tr>
<td><strong>For Context Similarity Unit</strong></td>
<td>Land Use Systems (LUS) of van Asselen et al. (2012), global, res. 10km</td>
<td>Optional (e.g. Tunisian SAAZ x LUS, or ICARDA's fCSET)</td>
</tr>
<tr>
<td><strong>For identifying Region of Interest (RoI)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Administration unit</td>
<td>GADM2, global, down to level 2</td>
<td>Op. for uploading for more detailed national adm. unit</td>
</tr>
<tr>
<td>- Specific polygons</td>
<td></td>
<td>Op. for (1) uploading own vector file, or (2) drawing polygons</td>
</tr>
<tr>
<td><strong>SLM data</strong></td>
<td>available SLM from WOCAT DB</td>
<td></td>
</tr>
<tr>
<td><strong>LU-LM planning scenario</strong></td>
<td>Successive graphic interfaces allow users to specify LU-LM transition over a period</td>
<td>LU-LM transitional area vs. LU type, or LU polygon within RoI</td>
</tr>
</tbody>
</table>
## Summary of data availability in Tunisia, potentially useful for LUP4LDN (WG result – Session 4.2)

### Data on other calculated LD maps:

- **LADA map**
  - Region: Tunisia
  - Time: 2010
  - Format; Resolution: shp; 1/500000

- **LUSuitability**
  - Region: Zaghouan
  - Time: 2004
  - Format; Resolution: shp; 1/25000

### Data on criteria needed for calculating LU Suitability (e.g. climate-, slope-, soil-related indices)

- **SRTM / GDEM**
  - Region: Tunisia
  - Time: 2009
  - Format; Resolution: grid; 30 m
  - Available source: online

- **Bioclimatic map**
  - Region: Tunisia
  - Time: 2000
  - Format; Resolution: shp; 1/500000
  - Available source: yes

### Data on LC and/or LU

- **Agricultural map**
  - Region: Tunisia / Governorate
  - Time: 2000
  - Format; Resolution: shp; 1/25000, 1/50000
  - Available source: yes

- **National Forestry Inventory**
  - Region: Tunisia / Governorate
  - Time: 2010
  - Format; Resolution: shp; 1/20000
  - Available source: yes (DGF)

### Data on current SLM

- **SLM data base**
  - Region: Siliana, Jendouba, Béja, Kebili
  - Time: 2018-2019
  - Available source: Files [https://qc.at.wocat.net/fr/wocat](https://qc.at.wocat.net/fr/wocat)
The Rmel watershed is located on the north-eastern of Tunisia, with a drainage area of 675 km². The watershed is selected for piloting because:

- It is an important water source and region for agricultural production of annual crops (cereals and vegetables), olive trees and orchards.
- It is facing risk of land degradation (esp. soil erosion) and siltation in reservoirs.
- Good data availability given by past and on-going projects.
- Region’s setting is well perceived by the SHs.
Rainfed Wheat and olive trees suitability maps in Rmel Watershed
Degradation map in Rmel Watershed
Proposed SLM and LUT maps in Rmel Watershed
Promote sustainable rural territories where the living conditions of affected local populations are improved

<table>
<thead>
<tr>
<th>Axes</th>
<th>Actions</th>
</tr>
</thead>
</table>
| Promote sustainable agrosystems that reconcile exploitation/protection of natural resources, improvement of the living conditions of affected populations and food security | · Support for agrosystems to make them levers for sustainable development and food security for affected populations  
· Diversification of income sources and improvement of living conditions to alleviate pressure on natural resources and ecosystems  
· Support affected populations to take charge of the protection of natural resources and ecosystems |
| Initiate inclusive development and reduce or even neutralize the precarious social effects due to natural disasters | · Development of cropping systems resilient to the effects of drought and ensuring food security for the affected population  
· Reduction of the risks of forced migration of populations under the effect of drought and/or food insecurity |
DS-SLM mainstreaming strategy – approach

SLM Mainstreaming and scaling up strategy

- Alliances
- Knowledge management
- Capacity building
- LDDDS and SLM assessments
- DS-SLM tools
- Best practices – SLM Technologies

Decision-making processes

- Policies/regulations
- Projects
- Financing and incentives
- Territorial Planning
- Local decisions

SLM BEST PRACTICES SCALING OUT

Barriers for implementing and scaling out SLM best practices

Ej. Falta de incentivos para MST
Thank for attention
Evidence-based decision-making for *Life on Land*

Scenarios for Integrated Land Use Planning

13th May
1 – 3 PM

**Meta perspective of FAO**

**Vera Boerger**

*Senior Land and Water Officer at FAO*

- Team Leader of the Integrated Land Management Team of the Land and Water Division of FAO with focus on integrated land use/resources planning, management and restoration, integrated landscape management, land governance and decision support,

- UNCCD focal point at FAO, co-lead of UN Decade for Ecosystem Restoration Task Force on Good Practices
Decision Support Framework for SLM mainstreaming and scaling out

**Module 1:**
Operational Strategy and Action Plan for mainstreaming and scaling out SLM

**Phase A:**
Review and Initial Strategy and Action Plan

**Module 2:**
National/Subnational Level Assessment
- Assessment of LD & SLM
- Partnerships with policy institutions and financing mechanisms

**Module 3:**
Selection of Priority Landscapes

**Module 4:**
Landscape Level Assessment
- Assessment of LD & SLM livelihoods and natural resources assessment
- Selection of SLM Best Practices

**Module 5:**
SLM Territorial Planning
- Prioritization and action plan for implementation with stakeholders
- SLM support mechanisms, partnerships with decentralized policy institutions and financing mechanisms

**Module 6:**
SLM Implementation and scaling out
- Multi-sector and multi-stakeholder process and impact assessment

**Module 7:**
Knowledge management platform for informed decision making

**Phase B:**
Partnerships and Capacity Development

**Phase C:**
Scaling Out through Policies, Territorial Strategies, Incentives, Financing Mechanisms
A comprehensive assessment, planning, implementation and monitoring approach - Morocco

National to sub-national to local level - LADA/WOCAT tools

Negotiation process

Participatory identification of communities’ SLM priorities to combat LD & restoration

Implementation of management and restoration and Monitoring

DS-SLM Project
Strengthening rural development planning through land resources planning – Small Islands Development States (SIDS)

Agricultural Land Act:
- Protect agricultural land
- Optimize land use by other competing sectors
- Reduce conflict and enhance sustainability
Thematic Group: Networking opportunities and outlook

2:20 – 2:35 p.m.
Antje Hecheltjen
Project manager at GIZ and Co-Chair of the GEO-LDN Initiative

• Previously she worked as Associate Expert at UN-SPIDER, conducted research at the Center for Remote Sensing of Land Surfaces (ZFL) and the Center for Development Research (ZEF)

• Served as an independent consultant for UNCCD, the private sector and academia
Scenarios for Integrated Land Use Planning

A workshop series

organized by the ELD initiative, the GEO-LDN initiative, WOCAT, FAO and UNCCD

COP15: Evidence-based decision making for SDG15 - Life on Land!
13 May, 1 – 3pm
Workshop series: Scenarios for Integrated Land Use Planning (S4ILUP)

Outcome: Land use planning network to facilitate knowledge exchange, needs assessment, capacity development

- **05/2022:** COP Side Event
- **06/2022:** Advisory Board Meetings
- **07-08/2022:** S4ILUP Workshops
- **From 2023:** GEO-LDN Dialogue Forums

Portfolio of interoperable geospatial datasets and analytical tools

- FAO Toolbox
- LUP4LDN
- Trends.earth
- And many more.

Joint ILUP Guidelines

- Updated FAO LUP guidelines
- GM guidebook on data use in ILUP
- GIZ/ECO guidebook on data use in ILUP
Survey: The enabling environment for data use in LUP decision making

**Background:** Data and tools not often used in LUP – Why?

**Aim:** Identify factors of and ways to create an “enabling environment” for data use in LUP decision making

**Target group:** project managers – e.g. development cooperation, GM, GEF – and their local partners in LUP

**Deliverables:**

1. Guidebook containing:
   - overview of different LUP processes and the role of data,
   - needs expressed by project managers and LUP decision makers,
   - guidance on how to facilitate the integration of data,
   - good practices

2. Checklist that can be used by project developers in the project design phase

Thank you!

For more information, check out our website:

contacts: antje.hecheltjen@giz.de; hanna.albrecht@giz.de
Pedro Lara Almuedo

*Land Use and Climate Change Officer, Global Mechanism of the UNCCD*

- Over 10 years working at the UNCCD secretariat and the Global Mechanism, for the last 4 years as the team lead of the LDN Target Setting Programme supporting 129 participating countries.

- 4 years working for the Regional Government of Andalusia (Spain) supporting climate change policies and action plans and the sustainable management and conservation of protected areas.

- 4 years coordinating the Research and Extension Programme on Ecosystem Management and Conservation Biology of British Columbia (Canada).
Evidence-based decision-making for Life on Land!

Scenarios for Integrated Land Use Planning

13th May 1 – 3 PM

Closing: Discussion and Q&A 2:35 – 3:00 p.m.