

## IIASA-ESM

### Center of Landscape Resilience & Management (C L R)

**AIM:** Improve risk-resilient and sustainable management of land-based ecosystems by generating impact through policy-relevant research at multiple geographic scales

**TEAM:** 24 scientific staff members (inter alia specialists in forestry, agriculture, soil sciences, remote sensing, biology, environmental sciences, physics, mathematics, economics/social sciences, architecture, industrial engineering, project management), 9 guest researchers and one center administrator.

#### **ORGANISATION:**

Center Head    Dr. Florian Kraxner, ESM Deputy Director, forest and environmental scientist specialized in mountain risk engineering

Group Leaders:

- Forest Ecology and Management (FEM) Group: Prof. Dmitry Schepaschenko, forest scientist and remote sensing specialist
- Agro-Environmental Systems (AES) Group: Dr. Juraj Balkovič, agricultural and soil scientist
- Sustainable Resources Optimization (SRO) Group: Dr. Sylvain Leduc, industrial engineer

**RESEARCH:** The center emphasizes on land-use by the forestry, agriculture, and the renewable energy sectors. Furthermore, the management of other natural ecosystems and their services at landscape level – including biodiversity and the integration of the Food-Water-Energy Nexus into the urban space - form part of the core research.

In particular, CLR examines local, national, regional, and global agriculture and forest ecosystems and their interactions with natural resources. Under a growing demand for bio-based material special emphasis is put on the bioeconomy sector, adequate design of policy regulations, and climate change in order to identify sustainable biogeophysical potentials, land management pathways, and optimal supply chains for the production of food, feed, fiber and renewable energy. Furthermore, CLR explores the impacts of managing ecosystems on the society and the environment, including disturbances, nutrient cycles (i.e. carbon, nitrogen, phosphorus), water resources, soil quality, greenhouse gas emissions, and negative emissions technologies. Special emphasis is paid to sustainable biomass production as one of the most essential climate variables.

- Global Forestry Model G4M – [www.iiasa.ac.at/G4M](http://www.iiasa.ac.at/G4M)
- Global Agriculture Model EPIC – [www.iiasa.ac.at/EPIC](http://www.iiasa.ac.at/EPIC)
- Supply Chain Optimization Model BeWhere – [www.iiasa.ac.at/Bewhere](http://www.iiasa.ac.at/Bewhere)

## **EXTERNAL & INTERNAL PROJECTS (2018/2019):**

### ***CLR Coordination:***

RESTOREPLUS - global tropical landscape restoration, [www.restoreplus.org](http://www.restoreplus.org)

Sustainable Bioeconomy Futures - developing bioeconomic pathways,  
[www.iiasa.ac.at/clr/sbf\\_malaysia](http://www.iiasa.ac.at/clr/sbf_malaysia)

SEPA Modelling - modeling forest management and wildlife population dynamics,  
[www.iiasa.ac.at/clr/projects/SEPA-Moose](http://www.iiasa.ac.at/clr/projects/SEPA-Moose)

VERIFY - estimating greenhouse gas emissions to support emission reporting,  
<http://verify.lsce.ipsl.fr/>

### ***CLR Partnerships***

GGR-NERC - comparative assessment and region-specific optimization of greenhouse gas removal,  
[http://gotw.nerc.ac.uk/list\\_full.asp?pcode=NE%2FP019900%2F1&cookieConsent=A](http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FP019900%2F1&cookieConsent=A)

BECOOOL - cooperation for the development of advanced lignocellulosic biofuels,  
<http://www.becoolproject.eu/>

FORMAS LTU - integration of renewable electricity systems with the biomass conversion sector,  
[www.iiasa.ac.at/clr/formas-ltd](http://www.iiasa.ac.at/clr/formas-ltd)

### ***CLR Contributions***

FARM - investigating agricultural drought risk management in Austria and Europe as a whole,  
[http://www.iiasa.ac.at/web/home/research/researchPrograms/RISK/Farmers\\_and\\_Risk\\_Management.html](http://www.iiasa.ac.at/web/home/research/researchPrograms/RISK/Farmers_and_Risk_Management.html)

FORCU - modification and adjustment of the full verified carbon account of forest ecosystems (Ukraine), [www.iiasa.ac.at/clr/forcu](http://www.iiasa.ac.at/clr/forcu)

IMBALANCE-P - quantifying the responses of phosphorus limitations on life, earth system and society, <http://imbalancep-erc.creaf.cat/>

COACCH - co-designing the assessment of climate change costs by improved downscaled assessment of the risks and costs of climate change in Europe, <https://www.coacch.eu/>

**COLLABORATION:** CLR fulfills not only a bridging function within different ESM centers and their models, and also towards various IIASA Programs (e.g. ENE, MAG, RPV, etc.), but also plays an active role in NMO service (e.g. Russia, Sweden, UK, Indonesia, US, Vietnam, Malaysia, Japan, Ukraine, etc.). Furthermore, CLR is collaborating largely with renowned research organizations outside IIASA (e.g. Canada Forest Service, CAS, EDF, FAO/UNECE, ICRAF, Imperial College, INPE, Korea University, MCC, NIES, Stanford University, SUSTECH, UNEP-WCMC, US Forest Service, WWF, etc.)

## OUTPUT:

### *Academia and research community services*

- Publications in academic journals, books, book chapters
- Dissemination of results at (international) scientific events
- Organizing scientific workshops and conferences
- Developing and improving of mainly open-source (ESM) models and their information environment
- Support of doctoral/master theses and scientific exchange in close cooperation with partnering universities and other research institutions (inter-alia IIASA YSSP and Post-Docs, co-hosting of students, exchange of scientists with partnering institutions, internships)
- Input to other groups/models at ESM, IIASA and beyond
- Input to international and intergovernmental assessment processes (IPCC, IPBES, ...)
- Interaction with the corresponding research and engagement platforms (e.g. Future Earth, GCP, MaGNET)
- Outreach for joint project development and the promotion and support of ESM and IIASA topics and strategies