

Application of biophysical models and stakeholder recommendations

In NEXOGENESIS, we focused on applying biophysical models in five case studies to assess environmental and ecological impacts, while integrating local stakeholder input. The objective was to refine the System Dynamics Models to ensure they align with real-world conditions and stakeholder needs. We modelled how different water-energy-food-ecosystem (WEFE) dynamics unfold under a series of policy and climatic scenarios.

Biophysical models and their application

Biophysical models help predict how ecosystems respond to different environmental changes. These models simulate among others, hydrology, soil moisture, land use, and vegetation productivity across different climate scenarios. We tested different model configurations to improve accuracy and usability in decision-making processes.

Key findings



The success of biophysical models depends on the **quality of input data** and how well they represent local conditions. One major finding was that models need to integrate more **site-specific data** to produce reliable results. Additionally, climate variability had a significant impact on land productivity, emphasizing the need for adaptable models.

Stakeholder contributions and recommendations

Stakeholder engagement included workshops and interviews with farmers, local authorities, and environmental groups. Their contributions helped identify missing local data, prioritize policy variables for inclusion in simulations, and validate conceptual maps and SDMs. Recommendations included simplifying model outputs for policymaker use, improving training and support for model interpretation, and ensuring that models are accessible and transparent to non-specialists.

Conclusions and next steps



The application of biophysical models has proven valuable, but improvements are necessary for greater reliability and usability. Future work should focus on refining model accuracy through better data integration, improving communication between scientists and stakeholders, and ensuring that the models address specific local challenges. The next steps involve further testing, refining recommendations, and promoting the practical use of these models in environmental management.

To learn more about the NEXOGENESIS' application of biophysical models and stakeholder recommendations, read our corresponding deliverable: [Here](#).

More about the project: <https://nexogenesis.eu/>

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