NCA AND IEEM: AN INTRODUCTION

IEEM VIDEO

IEEM

Integrated Economic-Environmental Modelling Platform.

1 WHAT'S NEW?

Publication of the first environmental-economic statistical standard (SEEA- System of Environmental-Economic Accounting), and; advances in economic modelling.

2 WHY IS THIS CRITICAL FOR IEEM?

The SEEA is compatible with a country's National Accounts. This enables the modelling of entire economies and the evaluation of public policy and investment impacts on economic and environmental (green and brown) indicators.

3 WHY IS THIS IMPORTANT?

The integration of natural capital in IEEM makes it possible to analyze impacts not only on economic flows (gross domestic product), but also on the wealth of a nation which is fundamental for the economic growth and development of future generations.

4 WHAT IS THE BENEFIT?

IEEM's language is very much economic which helps create openings for dialogue with Ministries of Economics and Finance. IEEM supports countries in prioritizing actions relevant to achieving the SDGs and NDCs.

For further information on IEEM platform, please contact Onil Banerjee at onilb@iadb.org

IEEM OUTPUTS: MODELS

1. IEEM-GENERIC, Generic version that can be applied to any country with strong national accounts and environmental accounts under United Nations Systems. IEEM-GEN is programmed in GAMS and in GEMPACK software and is available in a single country or multi-regional version. The model comes complete with model code, user manual and mathematical model statement.

2. IEEM-GUA. The first IEEM developed, this IEEM for Guatemala is available in single country and multi-regional (20 regions) versions, and is calibrated with the most recent National and Environmental Accounts.

3. IEEM-CRI. This version of IEEM for Costa Rica is calibrated with the most recent National and Environmental Accounts.

4. IEEM-COL This version of IEEM for Colombia is calibrated with the most recent National and Environmental Accounts.

5. IEEM-RWA. Developed through participation in a Science for Nature and People Partnership, IEEM-RWA is the first IEEM developed outside the LAC region.

6. IEEM-GUA + ESM. This version of IEEM is linked to a land use land cover and ecosystem service modelling and accounting framework.

7. IEEM-COL + ESM. This version of IEEM is linked to a land use land cover and ecosystem service modelling and accounting framework.

8. IEEM-WEB. This is an IEEM web interface hosted on an external server enabling one to ‘test-drive’ policy simulations with IEEM, run scenarios, generate results and present them on an interactive geographic information system.

IEEM OUTPUTS: TRAINING + MATERIALS

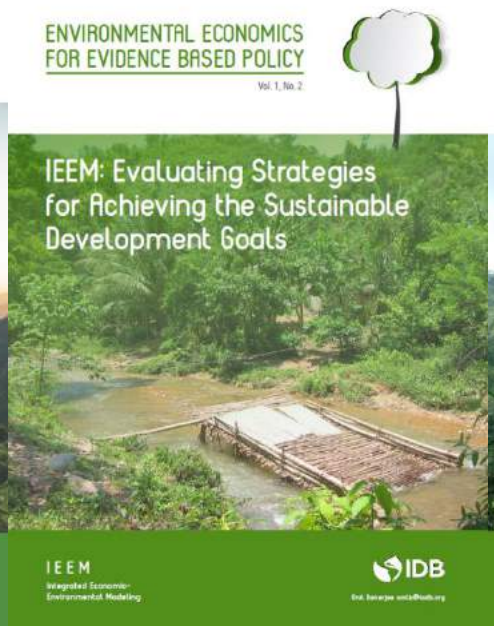
1. Central Bank of Costa Rica. Delivering two-weeks of IEEM training (April 17 to 21, 2017; July 3 to 6, 2017). Pursuing joint application of IEEM to 2 themes of interest for the Central Bank with two peer reviewed publications and policy briefs to follow.

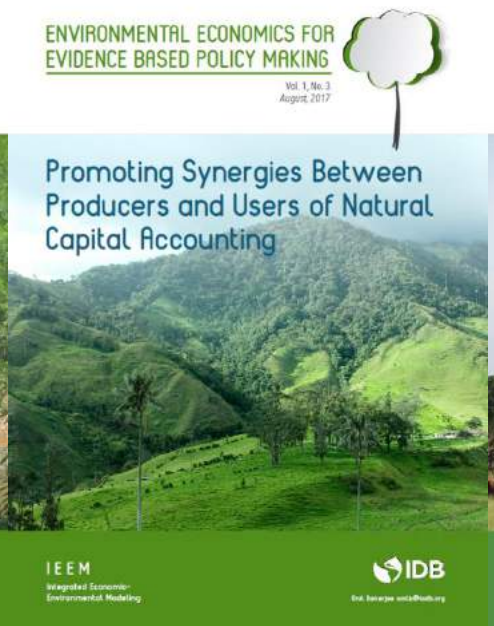
2. National Planning Department of Colombia. Delivering one week of IEEM training (May 8 to 11, 2017) including a half day event open to Government Ministries, think tanks and academia to present IEEM and its application to public policy. Pursuing joint application of IEEM to various theme of interest for the DNP with one peer reviewed publication and policy brief to follow.

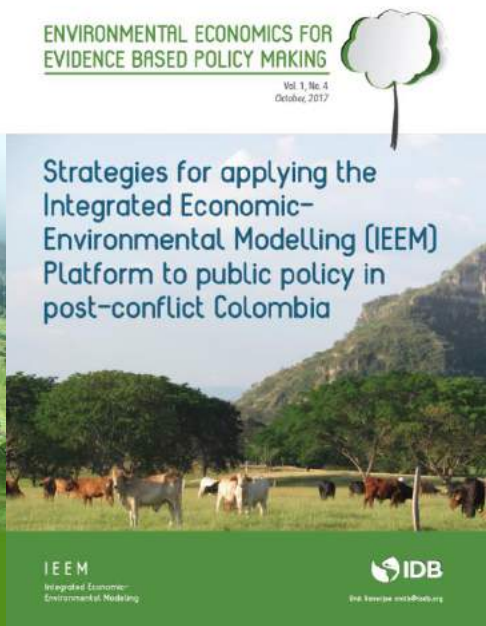
3. Guatemala's Secretariat for Planning and various other institutions in Guatemala including the Universidad Rafael Landívar and IARNA. One week training course and half day event open to Ministries, think tanks and Academia presenting IEEM; delivered August 29 to September 2 2016.

4. United Nations ECLAC. Providing model and training materials in on-demand basis.

IEEM OUTPUTS: COMMUNICATIONS







IEEM OUTPUTS: COMMUNICATIONS

1. Seminars and Brown Bag Lunches (BBL).

- IEEM Inception Seminar: organized by IEEM, World Bank WAVES and Guatemala's SEGEPLAN, Guatemala City, September 11, 2014.
- IEEM BBL: organized by World Bank, World Bank, Washington DC, November 13, 2014.
- IEEM BBL: organized by IEEM, IDB Headquarters, Washington DC, February 4, 2015.
- IEEM seminar: organized by Montclair University, Montclair, April 28, 2015.
- IEEM seminar: organized by IEEM: speakers Onil Banerjee (IDB), Carl Obst (IDEEA), and Juan Pablo Catañeda (World Bank), IDB Headquarters, Washington DC, June 14 2016.
- IEEM organized session at the Global Trade Analysis Project (GTAP) Annual Conference, organized by IEEM with speakers: Onil Banerjee (IDB), Carl Obst (IDEEA) and Glyn Wittwer (Monash University), World Bank, Washington DC, June 15, 2016.
- World Bank Natural Capital Forum: organized by the World Bank, The Hague, The Netherlands, November 2016.
- IEEM seminar: organized by the World Bank/IEEM, World Bank, Washington DC, March 31, 2017.

IEEM OUTPUTS: COMMUNICATIONS

1. Seminars and BBLs continued.

- IEEM seminar at the United Nations and World Bank event “Sustainable Development Agendas: How Energy and Emission Accounting Can Contribute to Policy Design and Decision Making”, Antigua, Guatemala, May 16 to 18, 2017.
- IEEM ecosystem service modelling workshop: organized by IEEM, IDB Office in Guatemala City, May 16, 2017.
- IEEM session at World Bank WAVES’ Annual Partners Meeting, June 5 to 7, 2017.
- IEEM seminar at the Global Trade Analysis Project (GTAP) Annual Conference, Purdue University, West Lafayette, June 7, 2016.
- IEEM seminar at Colombian Government’s Green Growth and Economic Policy Symposium, Bogotá, July 18 to 19, 2017.
- IEEM seminar at United Nations Commission Economic Commission for LAC and the IDB “ Public Policy Analysis with CGE Models”, Lima, November 7 and 8, 2017; presented “Post-Conflict Land-Use Trajectories in Colombia”.

2. IEEM Video. Seven minute video demonstrating origins of IEEM and applications to evidence-based policy design (graphic design with voice-over).

3. Other communications materials include one IEEM infographic and 4 policy briefs.

IEEM OUTPUTS: CHAPTERS/JOURNAL PUBLICATIONS

1. Banerjee, O., Cicowiez, M., Vargas, R., and Horridge, M. 2017. Assessing Strategies to Achieving the SDGs: An Integrated Economic-Environmental Modelling Approach. In: Vardon, M., Bass, S., Ruijs, A. & Ahlroth, S. (eds.). Better Policy Through Natural Capital Accounting: Stocktake and Ways Forward. Washington DC: WAVES World Bank.

2. Banerjee, O., Cicowiez, M., Vargas, R., and Horridge, M. 2017. The Integrated Economic-Environmental Modelling Platform: An Application to Guatemala's Fuelwood and Forestry Sector. In: Vardon, M., Bass, S., Ruijs, A. & Ahlroth, S. (eds.). Better Policy Through Natural Capital Accounting: Stocktake and Ways Forward. Washington DC: WAVES World Bank.

3. Banerjee, O., Cicowiez, M., Horridge, M. and Vargas, R. 2016. A Conceptual Framework for Integrated Economic-Environmental Modelling. Journal of Environment and Development, 25(3), pp.276 - 305.

4. Banerjee, O., Cicowiez, M., Vargas, R. and Horridge, M. In press. The SEEA-Based Integrated Economic-Environmental Modelling Framework: An Illustration with Guatemala's Fuelwood/Forest Sector. Environmental and Resource Economics.

5. Banerjee, O., Cicowiez, M., Horridge, M. and Vargas, R. in preparation. Investing in Achieving the Sustainable Development Goals: An Integrated Economic-Environmental Approach.

IEEM OUTPUTS: CHAPTERS/JOURNAL PUBLICATIONS

6. Banerjee, O. et al. In preparation. A Framework for Estimating Socio-Economic Impacts of Ecosystem Change.

7. Banerjee, O. et al. In preparation. A Framework for Spatially Explicit Economy-Wide Modelling: An Application to Rwanda's Green Growth Strategy.

8. Banerjee, O., Alavalapati, J.R.R. and Lima, E. 2016. A Framework for Ex-ante Analysis of Public Investment in Forest-based Development: An Application to the Brazilian Amazon. Forest Policy and Economics, 73, pp. 204 - 214.

9. Banerjee, O., Cicowiez, M., Ochuodho, T., Wolde, B., Lal, P., Alavalapati, J.R.R. and Masozera, M. In review. Economic Impacts of Variation in Protected Area Visitation and Use Fees: The Case of Rwanda's Nyungwe National Park. Journal of Sustainable Tourism.

IEEM OUTPUTS: WORKING PAPERS

1. Banerjee, O., Cicowiez, M., Vargas, R. and Horridge, M. in press. The Integrated Economic-Environmental Modelling Framework: New Insights with the System of Environmental-Economic Accounts. Center of Policy Studies Working Paper.

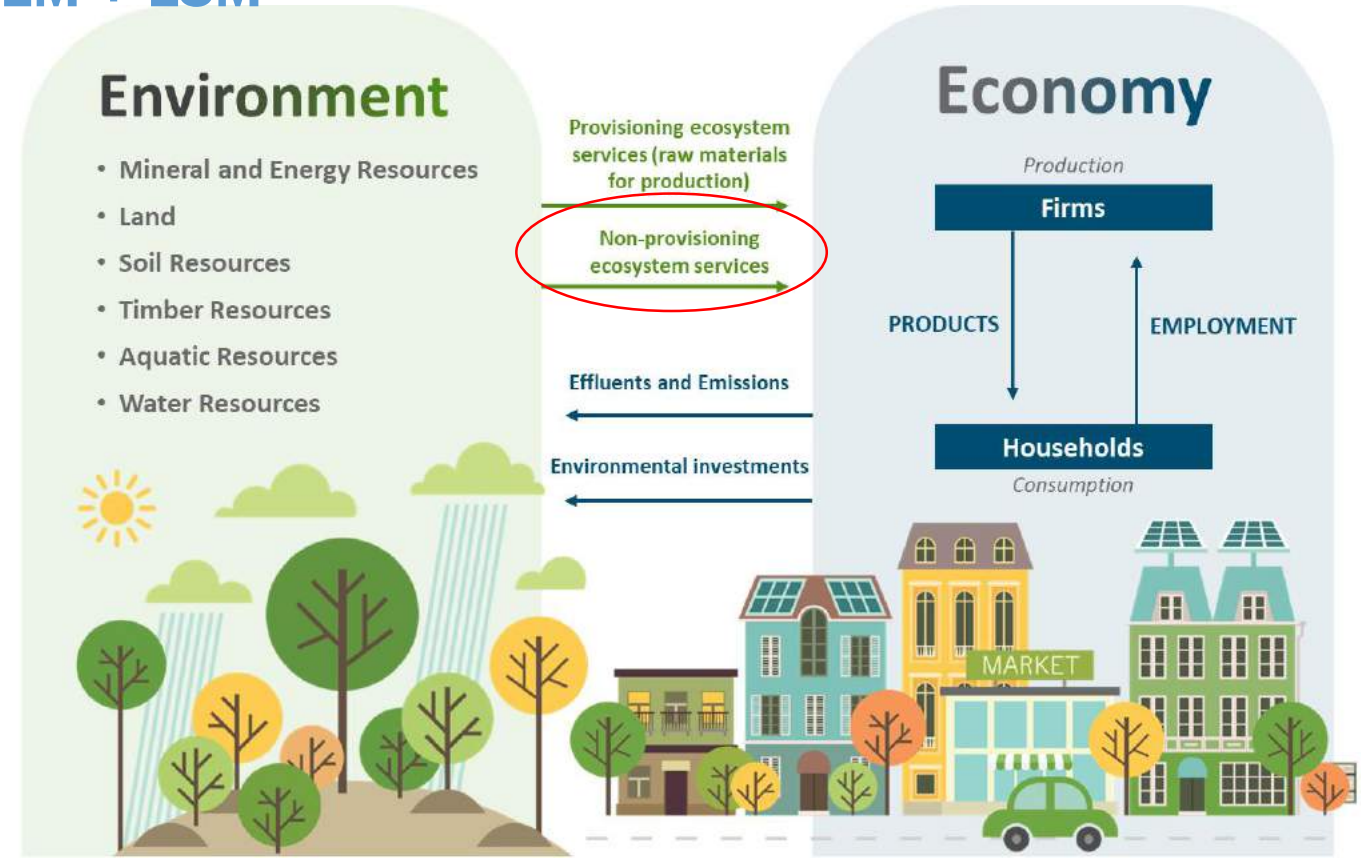
2. Banerjee, O., Cicowiez, M., Vargas, R. and Horridge, M. 2016. The Integrated Economic-Environmental Modelling Framework: An Illustration with Guatemala's Fuelwood/Forest Sector. Inter-American Development Bank Working Paper 757. Washington DC: Inter-American Development Bank.

3. Banerjee, O., Cicowiez, M., Horridge, M. and Vargas, R. 2016. A Conceptual Framework for Integrated Economic-Environmental Modelling. Centro de Estudios Distributivos, Laborales y Sociales, Universidad Nacional de la Plata. Documento de Trabajo Nro.202.

IEEM APPLICATIONS

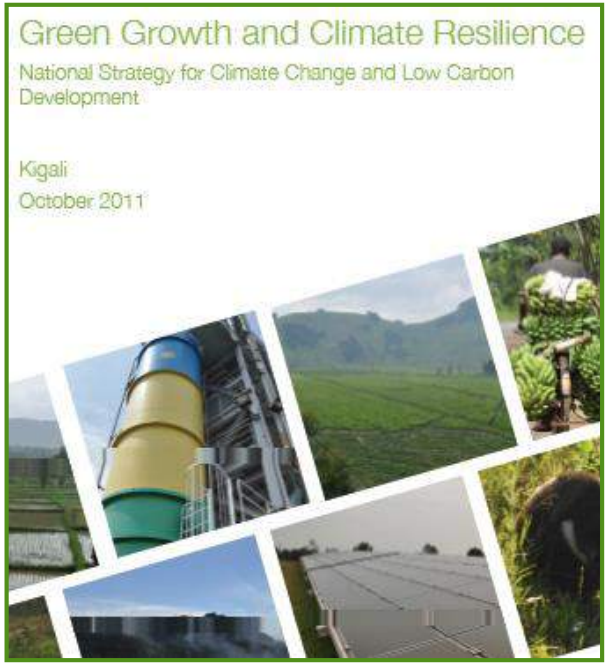
IEEM + ESM
RWANDA

IEEM + ESM


Environment
• Mineral and Energy Resources
• Land
• Soil Resources
• Timber Resources
• Aquatic Resources
• Water Resources
Provisioning ecosystem services (raw materials for production)
Non-provisioning ecosystem services
Effluents and Emissions
Environmental investments
Economy
Production
Firms
PRODUCTS
EMPLOYMENT
Households
Consumption
MARKET

RWANDA GREEN GROWTH

- Achieve middle income country status.
- Transform economy from subsistence-based to knowledge-based.
- Important aspects of Strategy are to increase agricultural productivity and forest cover.



SCENARIOS

FOR

Increase forest cover to 30%, planting 103,504 ha.

Cost: **US$285.6 million** over 12 years.

FUEL

Fuelwood provides 86% of energy. More efficient cookstoves/charcoal kilns improve efficiency by 25%.

Cost: **US$4.5 million** over 5 years.

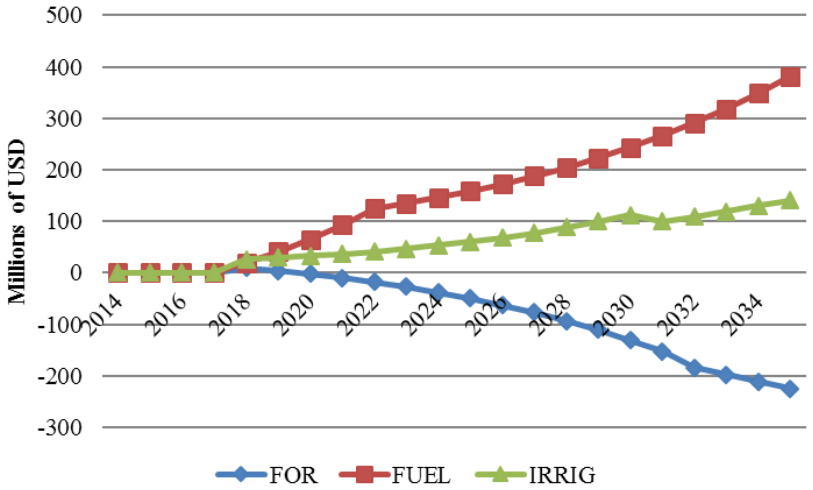
IRRIG

Increase irrigated area by 85,473 ha for 25% increase in productivity.

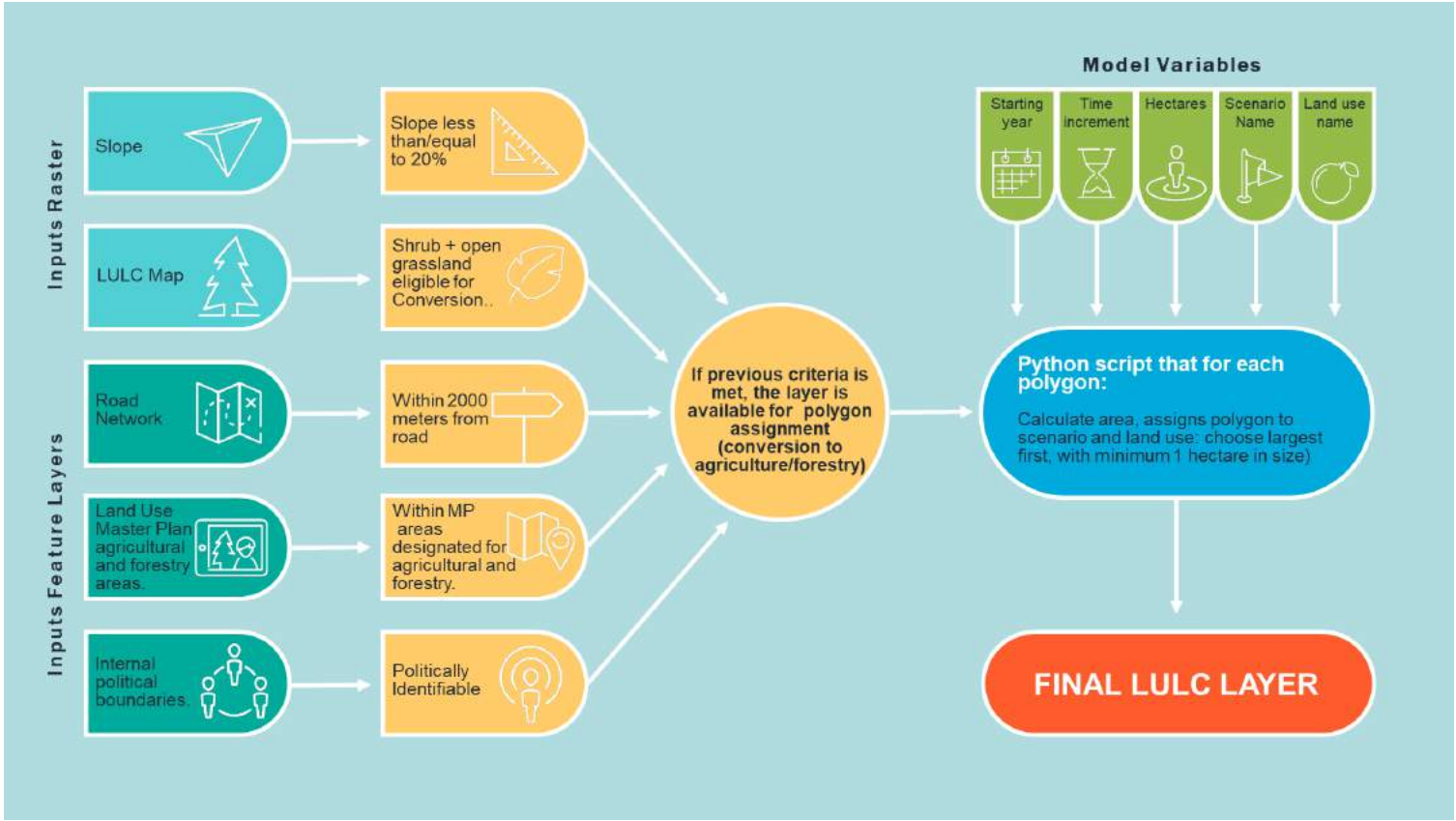
Cost: **US$972.5 million** over 12 years.

FOR RESULTS: GDP, DIFFERENCE FROM BAU

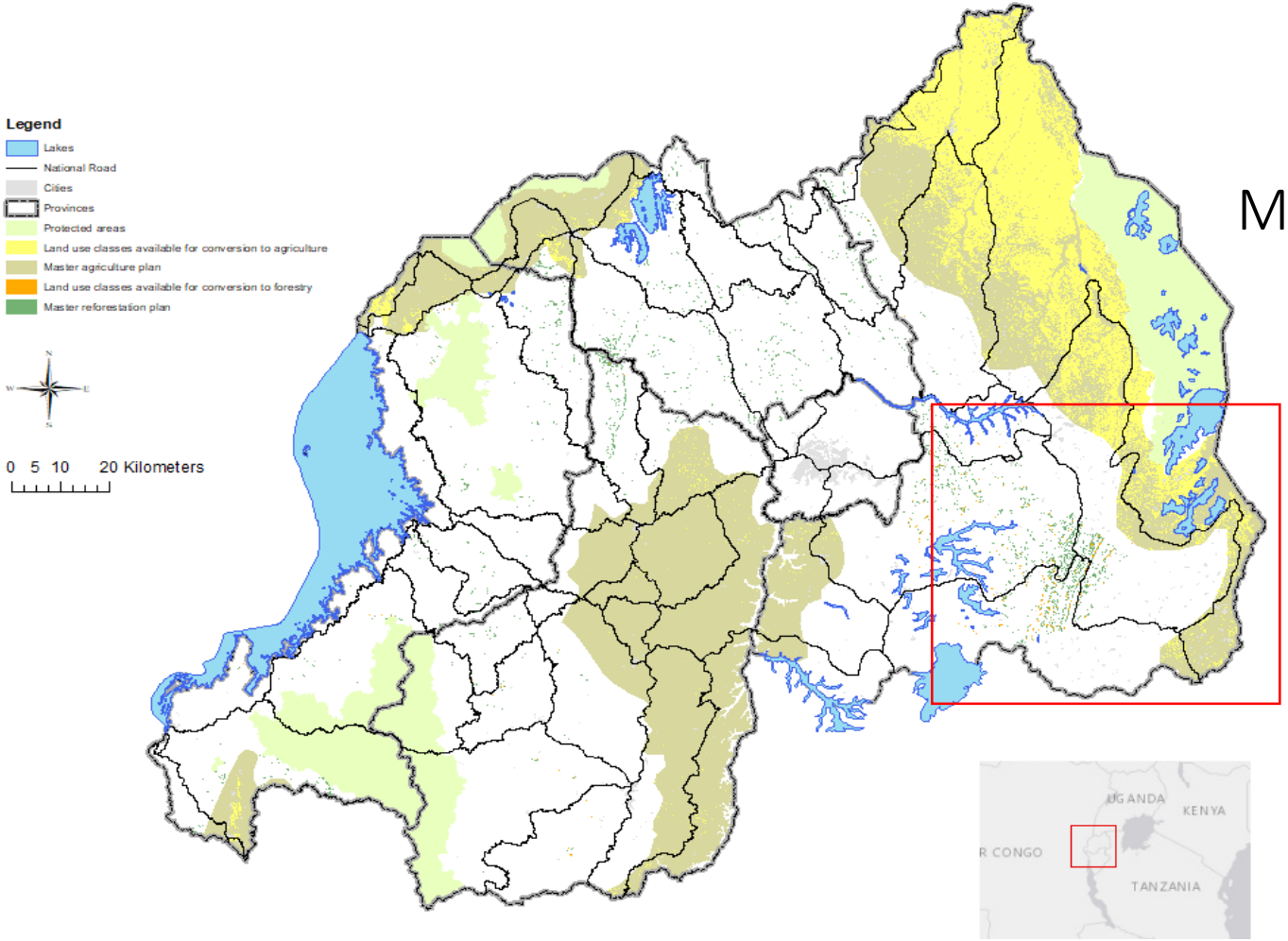
- FOR expansion is in competition with agriculture.
- FUEL allows reallocation of factors to other sectors (knowledge/services economy).

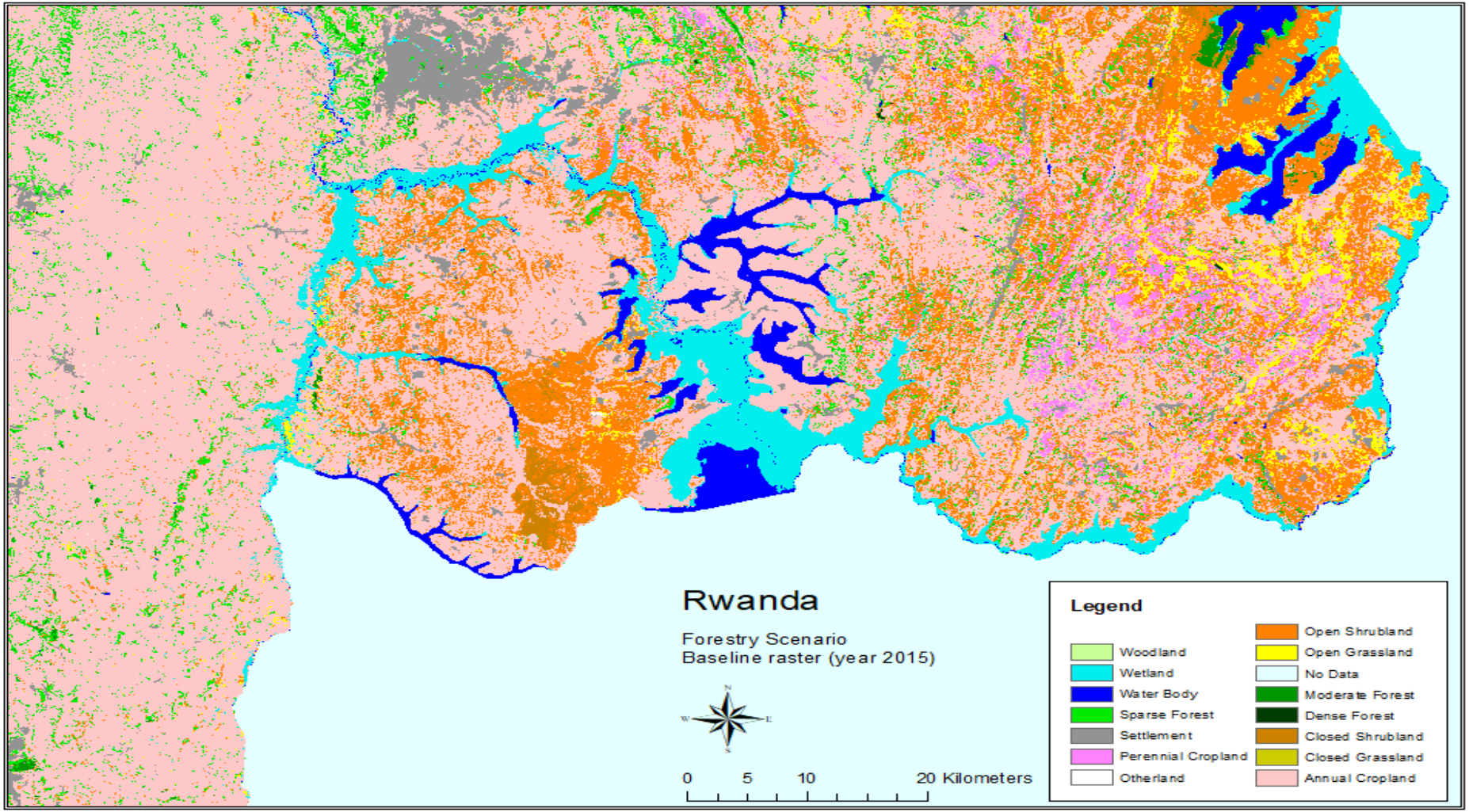


LAND USE LAND COVER MODEL



RWANDA MASTER PLAN




Rwanda
Forestry Scenario
Baseline raster (year 2015)
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20 Kilometers
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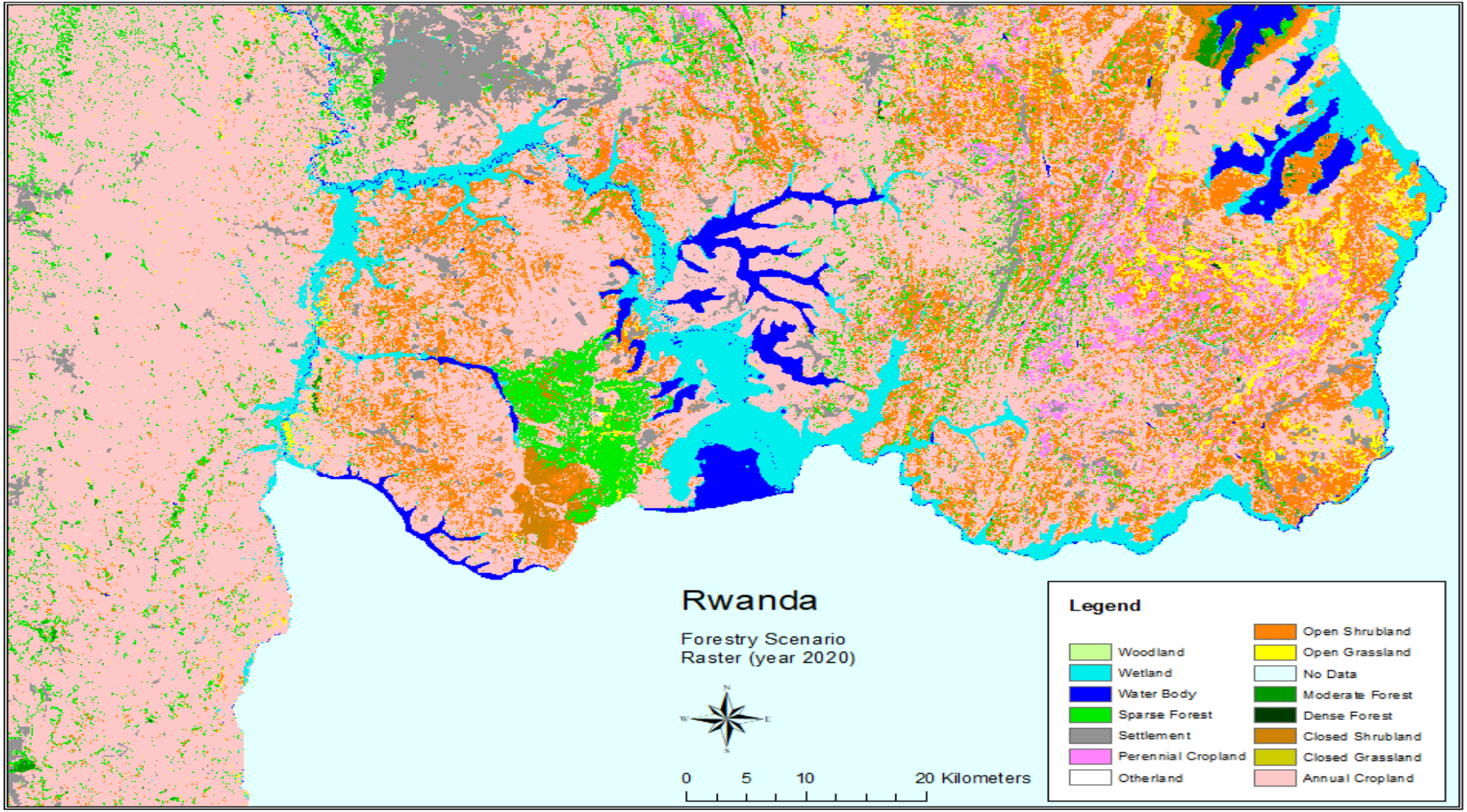
Wetland
Water Body
Sparse Forest
Settlement
Perennial Cropland
Otherland
Open Shrubland
Open Grassland
No Data
Moderate Forest
Dense Forest
Closed Shrubland
Closed Grassland
Annual Cropland


Rwanda
Forestry Scenario
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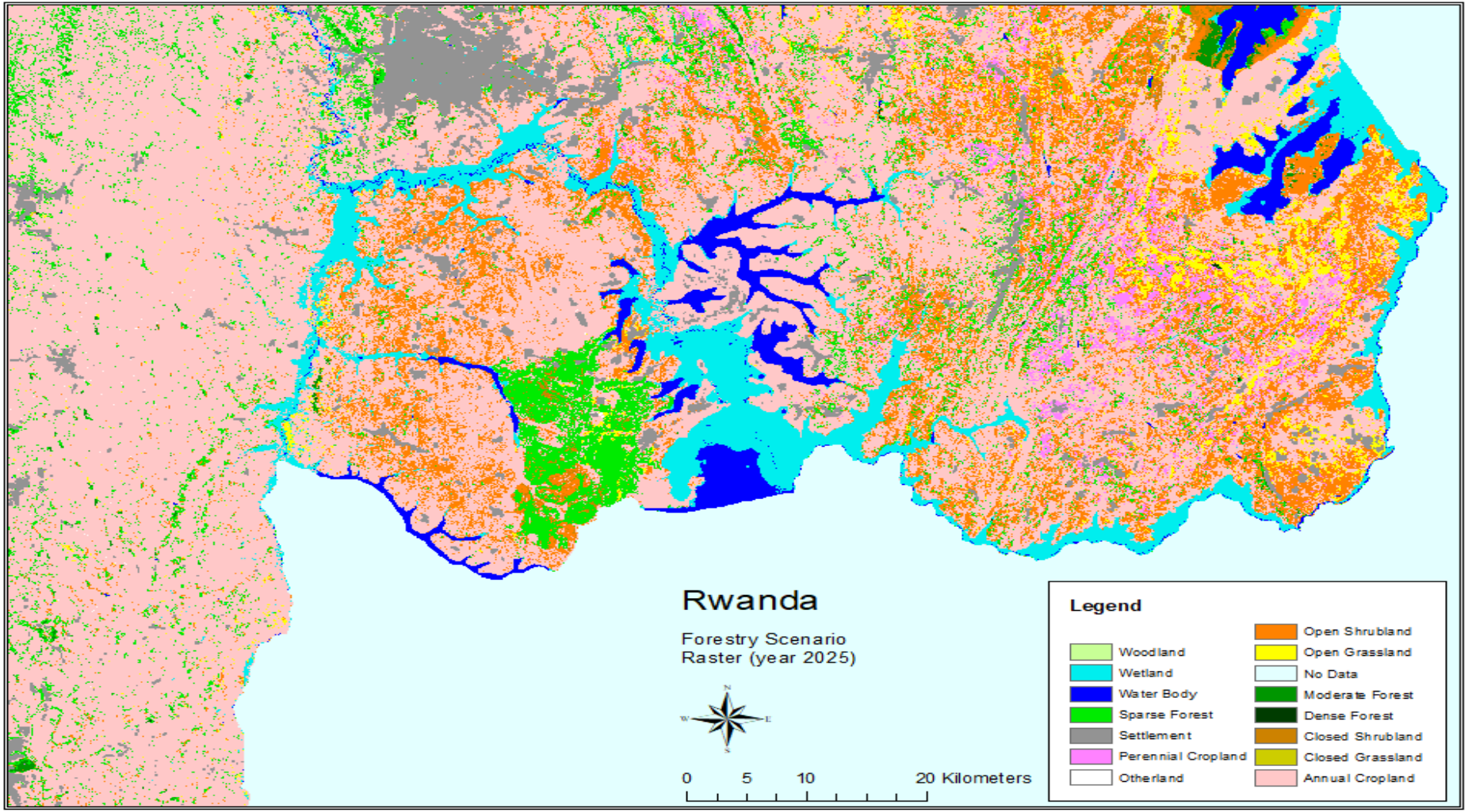
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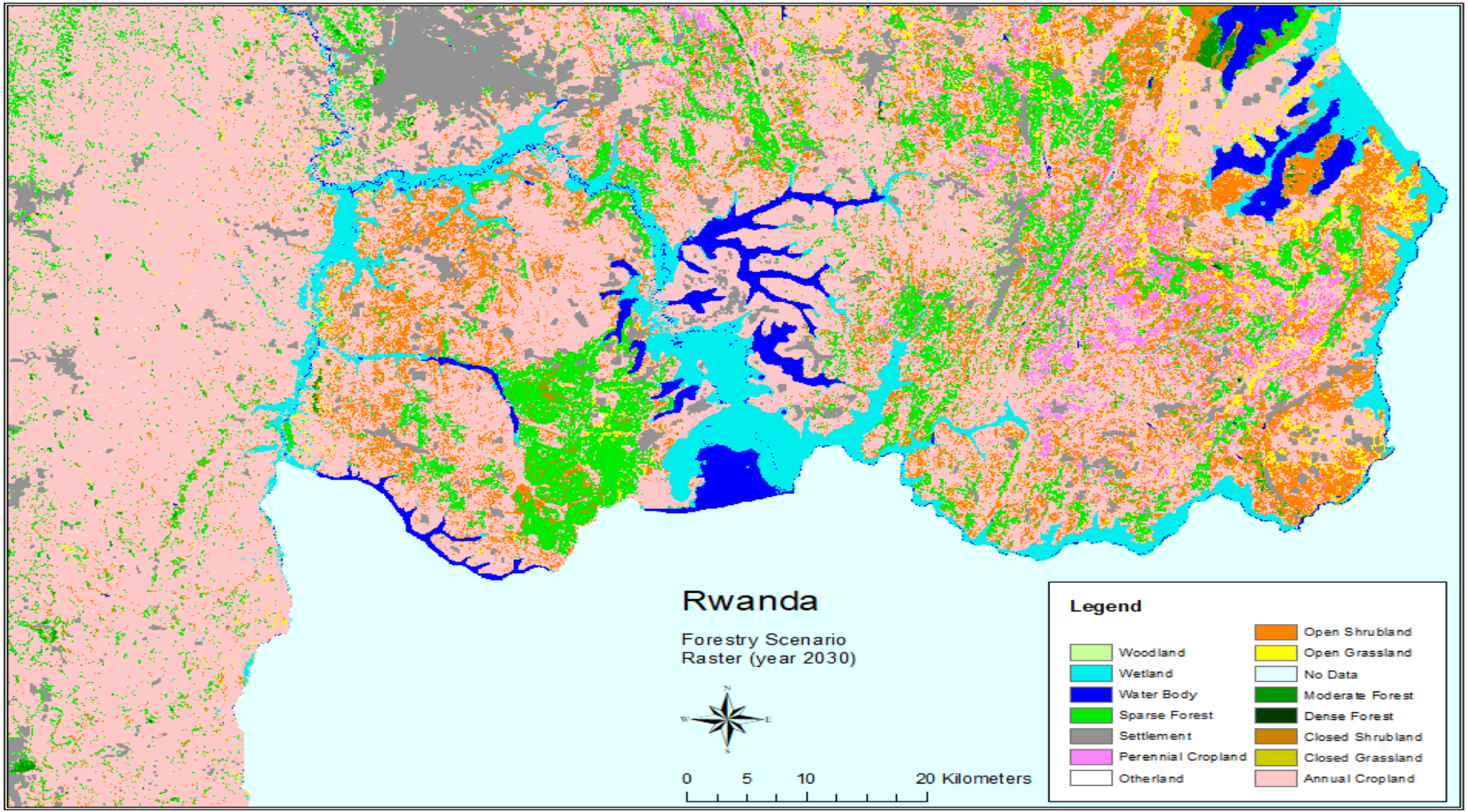
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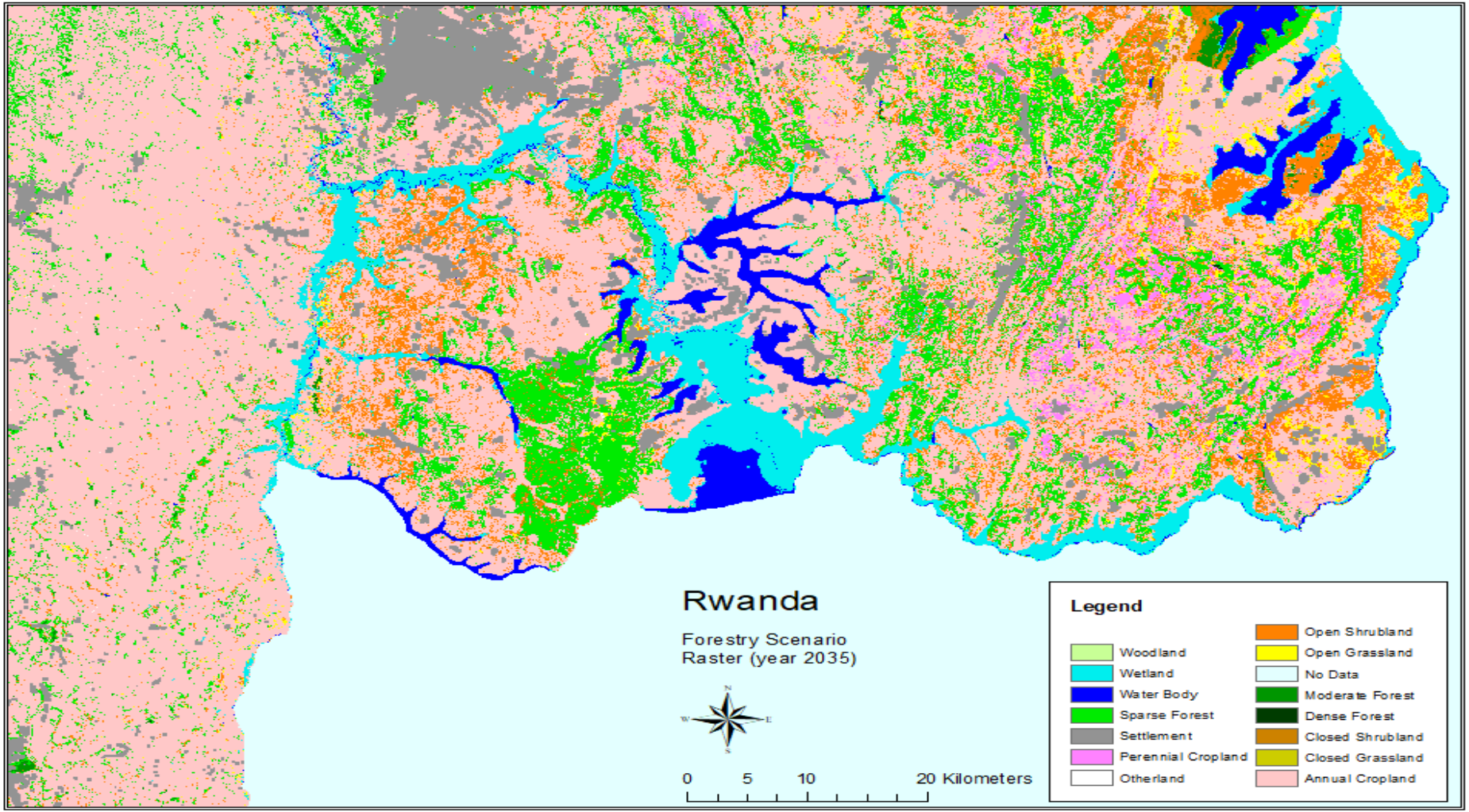
Rwanda
Forestry Scenario
Raster (year 2035)
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