PHOTO: IOM HONDURAS / ERICKESCOTO

COMMUNICATION BRIEF

BUILDING NEXUS RESILIENCE:
ADDRESSING MIGRATION AND CONFLICTS IN WATER-ENERGY-FOOD (WEF) SYSTEMS

WEBINAR2

INTEGRATING MIGRATION MODELS AND WEF NEXUS ASSESSMENTS

SEPTEMBER 10, 2024

BACKGROUND

According to the International Organization for Migration, there were over 280 million international migrants in 2020, a number influenced by global crises such as conflicts, economic instability, and disasters, and positive factors like labor migration and free movement agreements. Migration drivers include water stress, extreme weather events, energy poverty, and food insecurity. This surge in migration trends also impacts host nations, particularly in regions already facing resource scarcity challenges. Anticipated climate change and population growth will exacerbate these challenges, causing nonlinear impacts across water, energy, and food systems. Migration can also contribute positively to all aspects of economic, environmental, and social development and is key to achieving the Sustainable Development Goals (SDGs). The 2030 Agenda for Sustainable Development recognizes the intricate interdependencies among these resource systems, but their complex relationships with migration (forced, economic, rural-urban, internal, and cross-border) remain insufficiently addressed. Understanding the connections between migration and key environmental resources (e.g., water, energy, and food) including how resource scarcity influences migration needs further study.

Existing Water-Energy-Food nexus models often fail to capture the nuanced interplay between conflicts and migration. Nexus communities from across the globe search for better tools to understand these trends and interconnections and guide anticipatory action toward improving the resilience of communities facing these pressures. Moreover, there is a need to understand the impact of the various underlying conditions and vulnerabilities on amplifying disaster risks related to water, energy, and food systems that contribute to migration. Also, connecting the vulnerability and resilience of resource systems (primarily water, energy, and food) with the nexus still needs to unravel solutions for long-term sustainable development. The webinar series aims to fill this gap.

OBJECTIVES

This webinar series aims to catalyze cross-disciplinary, cross-institutional, and international dialogues toward understanding the knowledge gaps and opportunities in taking a holistic, systems approach to addressing these tightly interconnected challenges. With a focus on water, energy, and food systems, the webinar series will also consider other key environmental resources like climate, land, and ecosystems.

OUTCOMES

The webinar series is envisioned to facilitate the development of a common framework and road map for integrating migration in nexus assessment tools. This would contribute to exploring and developing anticipatory tools and strategies incorporating migration dynamics into nexus assessments, aiming to guide policymakers, researchers, and practitioners toward evidence-based, sustainable, and resilient solutions.

- **Introduction**
  - > **Water-Energy-Food Nexus Tools and Opportunities for Integration with Migration Models**
    Dr. Bassel Daher, Texas A&M University, SustainFood Network, IWRA

- **Panel and Moderated Discussion**
  - > **The Importance of Water in Internal Climate Migration Modeling**
    Dr. Alex de Sherbinin, Columbia Climate School, Columbia University

  - > **Understanding the Nexus and Vulnerability to Improve Migration Models**
    Dr. Robert Oakes, United Nations University Institute for Environment and Human Security

  - > **Water-Migration-Gender Nexus: Towards Integrated Governance Strategies for (Non) Migrants**
    Dilare Ecenur Irbik, PhD Candidate, École de Santé Publique, Université Libre de Bruxelles
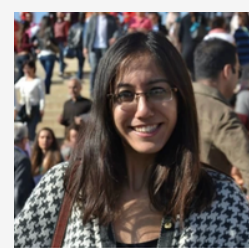
- **Moderated Q&A**
  Floor Brouwer, UNU-FLORES

- **Next Steps**
  Dr. Bassel Daher, Texas A&M University, SustainFood Network, IWRA

100+
participants

from

64 Countries

Frequency
45
1

© Australian Bureau of Statistics, GeoNames, Microsoft, Navinfo, Open Places, OpenStreetMap, TomTom, Zenrin
Powered by Bing

Bassel Daher
Texas A&M Energy Institue, Texas A&M University

LINK TO BIO

Alex de Sherbinin
Columbia Climate School, Columbia University

LINK TO BIO

Robert Oakes
Institute for Environment and Human Security, United Nations University

LINK TO BIO

Dilare Ecenur Irbik
École de Santé Publique, Université Libre de Bruxelles
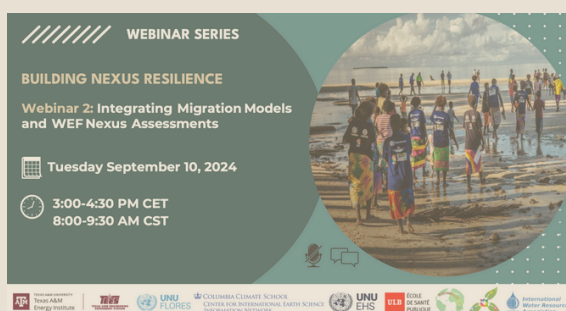
LINK TO BIO

Floor Brower
UNU-FLORES

LINK TO BIO

WEBINAR SERIES
Building Nexus Resilience W...
BUILDING NEXUS RESILIENCE
Webinar 2: Integrating Migration Models and WEF Nexus Assessments
Tuesday September 10, 2024
3:00-4:30 PM CET
8:00-9:30 AM CST

Watch Webinar 2 Recording

WEBINAR SERIES
BUILDING NEXUS RESILIENCE
Webinar 2: Integrating Migration Models and WEF Nexus Assessments
Tuesday September 10, 2024
3:00-4:30 PM CET
8:00-9:30 AM CST

Check Webinar 2 Slides

Webinar3
S gn Up
Governance Considerations and Evidence-based Policy Making
December 3, 2024

TEXAS A&M UNIVERSITY
Texas A&M Energy Institute

TEES
TEXAS A&M ENGINEERING EXPERIMENT STATION

UNU FLORES

COLUMBIA CLIMATE SCHOOL
CENTER FOR INTERNATIONAL EARTH SCIENCE INFORMATION NETWORK

UNU EHS

ULB ÉCOLE DE SANTÉ PUBLIQUE

International Water Resources Association IWRA

INTEGRATING WEF NEXUS TOOLS WITH MIGRATION MODELS

- Daher's presentation emphasized the complex interconnections between **water, energy, and food (WEF) systems** and the need for further studying the contributing role of insecurities within these systems to migration. He stressed the importance of a **systems approach** for addressing these interconnected challenges, as no single discipline, sector, or region can tackle these issues independently.

- Over the past decade, research on WEF Nexus issues has grown significantly, with various institutions globally contributing to the development of tools and methods for integrated resource management.

- **WEF Nexus tools**, including econometric models, input-output analysis, life cycle assessments, and system dynamic models, are being utilized to assess the **interdependencies** between water, energy, and food at different scales. These tools help evaluate **trade-offs** between resource management strategies and provide a framework for evidence-based decision-making in addressing sustainability challenges.

- **Migration models**, such as gravity models, radiation models, and agent-based models, have been developed to predict migration patterns. These models consider different determinants, including economic, non-economic, climate-driven, and behavioral factors.
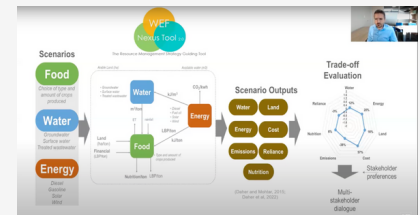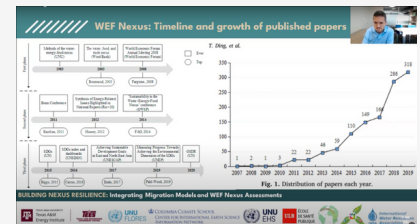
🔑 WEBINAR'S GUIDING QUESTIONS

The session was guided by key questions, including:
1. **How can migration models be integrated into WEF assessments given their interconnectedness?**
2. **What challenges and opportunities exist in this integration?**
3. **What are the current research gaps at the intersection of WEF and migration?**

IMPORTANCE OF WATER IN INTERNAL CLIMATE MIGRATION MODELING

- Alex de Sherbinin's presentation focused on using **scenario-based modeling** to predict **internal migration** driven by climate change, particularly emphasizing the role of water and food insecurity.

- The **Groundswell Report** uses a scenario-based approach, integrating different climate models and socio-economic development pathways to forecast migration patterns. The report projects that up to **260 million people** could become internal climate migrants by **2050** due to environmental changes.

- The **Africa Climate Mobility (ACMI) Initiative** focuses on **internal climate migration** in Africa, analyzing how water availability, crop production, and climate impacts contribute to migration. It integrates crop models and water availability models, to assess the impacts of climate change on migration patterns at the local level. The modeling approach utilized a **gravity modeling** method, combining **Shared Socioeconomic Pathways (SSPs)** and **Representative Concentration Pathways (RCPs)** to simulate future migration flows.

- Findings revealed that **water availability affects migration**: flooding can lead to migration as people decide to move away from flooded regions and droughts reduce agricultural productivity which promotes rural populations to migrate to urban areas, but can also lead to trapped populations.

- Migration is shaped by a complex mix of economic, social, climate, and governance factors, making it difficult to isolate single drivers in the models.
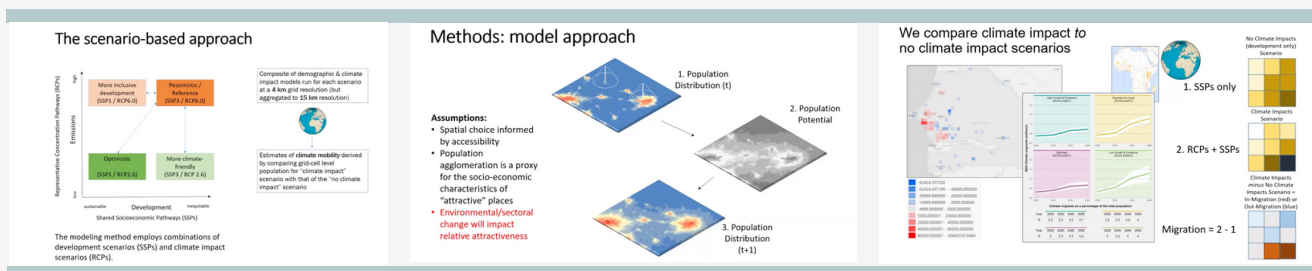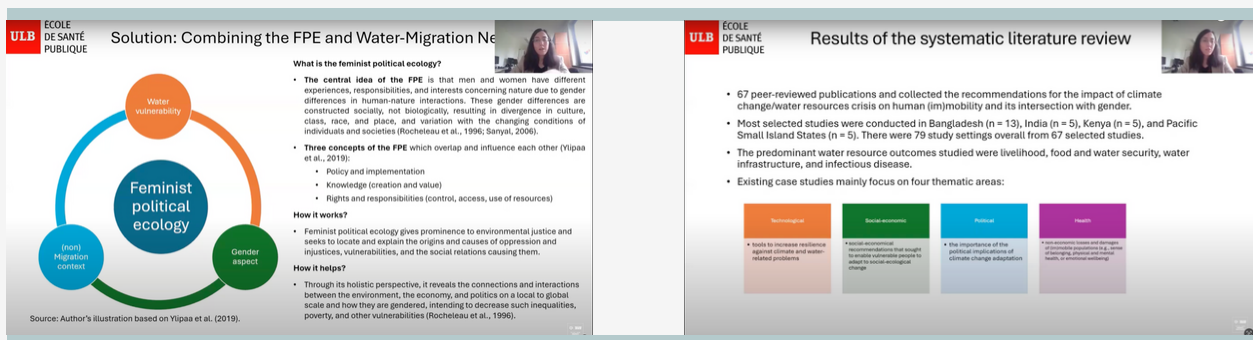
UNDERSTANDING THE NEXUS AND VULNERABILITY TO IMPROVE MIGRATION MODELS
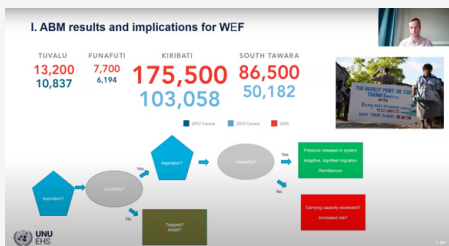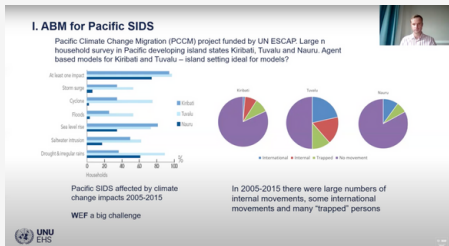
- Robert Oakes emphasized the importance of understanding vulnerability and agency in migration decisions, with **agent-based modeling (ABM)** being a key tool for capturing the complexities of household-level migration dynamics.

- Oakes highlighted how ABMs offer a detailed approach to understanding how **aspirations**, **capabilities**, and **social networks** influence migration, incorporating various factors such as economic conditions, environmental pressures, and social dynamics.

- Migration in Pacific SIDS, such as Kiribati, Tuvalu, and Nauru, is partly driven by environmental factors, including both flooding and droughts. These environmental challenges create pressure for internal migration, often moving populations from vulnerable outer islands to more urbanized ones.

- This urbanization process raises concerns about intensifying existing vulnerabilities by putting additional pressure on **limited water, food, and energy resources**

- There are also **"trapped populations"**, people who are unable to migrate despite the environmental challenges. These populations may lack the resources or capacity to migrate, which increases their vulnerability to climate change impacts.

- The study highlights the need for policies that address both those who can migrate and those who are forced to remain in high-risk areas.

- Migration is often a strategy for adapting to changing livelihoods and resource insecurities, not just a response to environmental shocks, and ABMs can model how social networks influence migration decisions.

WATER-MIGRATION-GENDER NEXUS: TOWARDS INTEGRATED GOVERNANCE STRATEGIES FOR (NON) MIGRANTS

- Irbik focused on the **gender dimensions** of migration in the context of water and food insecurity, advocating for a feminist **political ecology framework** to better understand these dynamics.

- While climate change and migration have been widely studied, research often lacks a gender perspective. The different perceptions and responses of men and women to climate change require an analysis of **social relations** and **power structures** to develop case-specific strategies.

- Water scarcity significantly impacts women, particularly during vulnerable periods such as pregnancy or postpartum. Women face additional health risks due to a lack of access to clean water and adequate nutrition. This indicates the need for gender-sensitive policies.

- A **gender lens** is necessary to fully understand migration patterns, as existing research often overlooks women's experiences and contributions to resource management.

- Integrating **feminist political ecology** into **WEF and migration** studies is important for addressing gender inequalities and advocating for gender-sensitive governance strategies.

- **Migration** is influenced by a complex interplay of factors, including environmental conditions, economic opportunities, infrastructure, social dynamics, political contexts, and demographic trends. The interwoven nature of these factors makes it challenging to distinguish between voluntary and climate-induced migration, as economic, social, and environmental drivers are deeply interconnected.

- **Current migration models** often overemphasize **physical factors** such as water availability and crop productivity, while underestimating the importance of **social and economic drivers**. More attention is needed to incorporate elements like social networks, cultural practices, and governance systems, which play crucial roles in shaping migration decisions.

- **Integrating WEF Nexus assessments with migration models** presents significant opportunities for a better understanding of how resource insecurities may contribute to migration, particularly in vulnerable regions. However, achieving this integration requires addressing challenges related to theory, data compatibility and model resolution.

- **Data availability and quality** remain significant challenges, particularly at subnational levels. There is a need for more granular, disaggregated data that includes social and economic vulnerabilities, such as those affecting women, children, and other marginalized groups.

- A **systems approach** is important for addressing the **interconnectedness of WEF systems** and **migration**, as no single discipline or sector can fully address these complex challenges independently. Cross-sectoral and interdisciplinary collaboration is necessary to develop effective solutions.

- **Holistic policy** approaches are needed that go beyond individual solutions, emphasizing integrated strategies to address the complex intersections of water, migration, and gender.
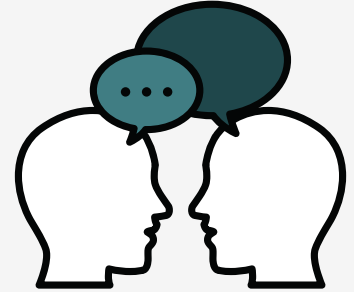
? OPEN RESEARCH QUESTIONS

- How can **migration models** better **incorporate society and networks, cultural practices,** and **governance systems** to reflect the complex realities of migration?

- How can **evidence-based governance frameworks** be developed to guide policy decisions at the intersection of migration and WEF Nexus challenges?

- How can **migration models** be effectively **integrated with Water-Energy-Food (WEF) Nexus assessments** to provide a more comprehensive understanding of the drivers and outcomes of migration?

- What **governance structures** and **policies** are necessary to support integrated responses to migration and WEF challenges, particularly in the context of climate change?

- How can **migration models be adapted** to better account for the experiences of vulnerable populations, including women, children, and ethnic minorities?

🔗 ADDITIONAL RESOURCES

- A Bibliometric Analysis of Food–Energy–Water Nexus: Progress and Prospects
- Water–energy–food (WEF) Nexus Tool 2.0: guiding integrative resource planning and decision-making
- CLIMADA: Economics of Climate Adaptation
- Groundswell: Preparing for Internal Climate Migration
- Assessing human habitability and migration
- Migration and Household Adaptation in Climate-Sensitive Hotspots in South Asia
- Migrants on the Move and Food (In)security: A Call for Research
- A Systematic Literature Review of Water-Migration-Gender Nexus Toward Integrated Governance Strategies for (Non) Migrants

For more information, check out:

WEBINAR SERIES WEBPAGE