

Climate migration policy simulation

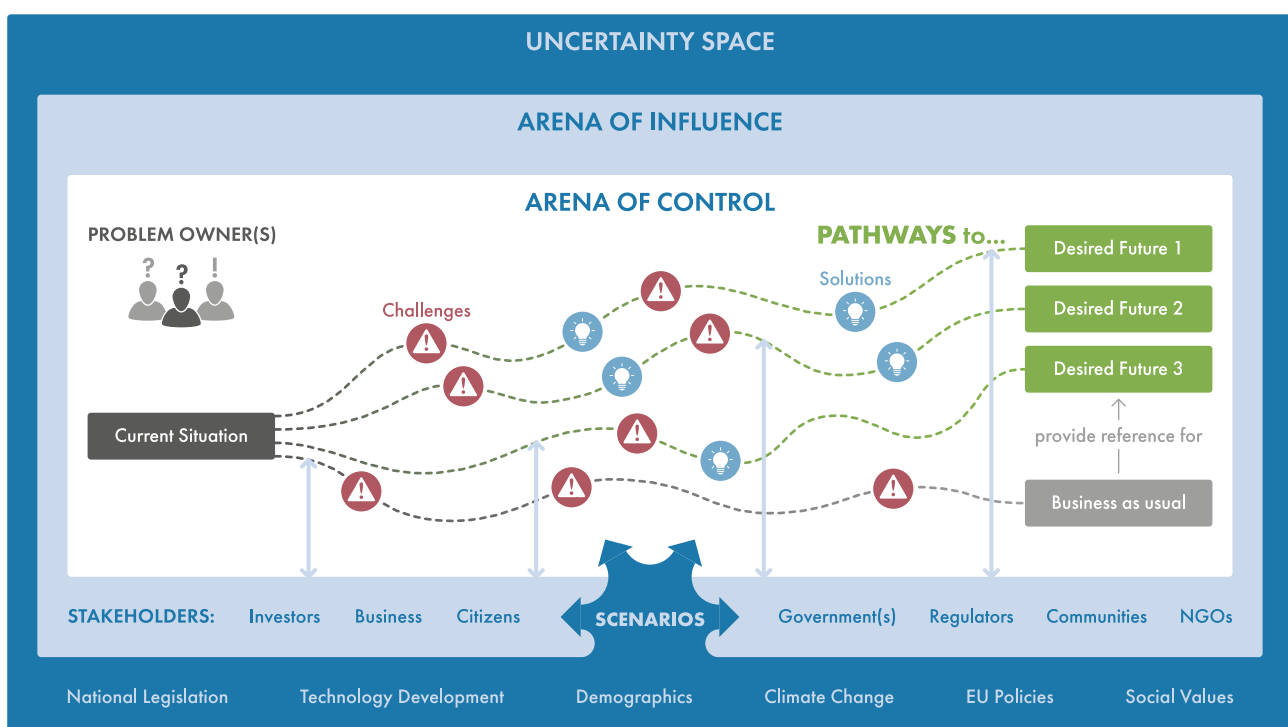
DEVELOPED IN THE PROJECT: **AGENT-BASED MODELS TO INFORM ECONOMIC POLICIES ON MIGRATION (ABM2POLICY)**

ABOUT POLICY SIMULATIONS

Policy Simulation is an experiential process where a group of participants collectively explore a complex reality. It is “social” because it requires collaboration between real people representing different groups and organizations. We call it a “simulation” because it emulates carefully selected real-world structures and processes. It is similar to a multi-player serious game, as it uses many game-like mechanics, but it also resembles interactive theatre by being open-ended meaning that the participants do not need to achieve any specific goals.

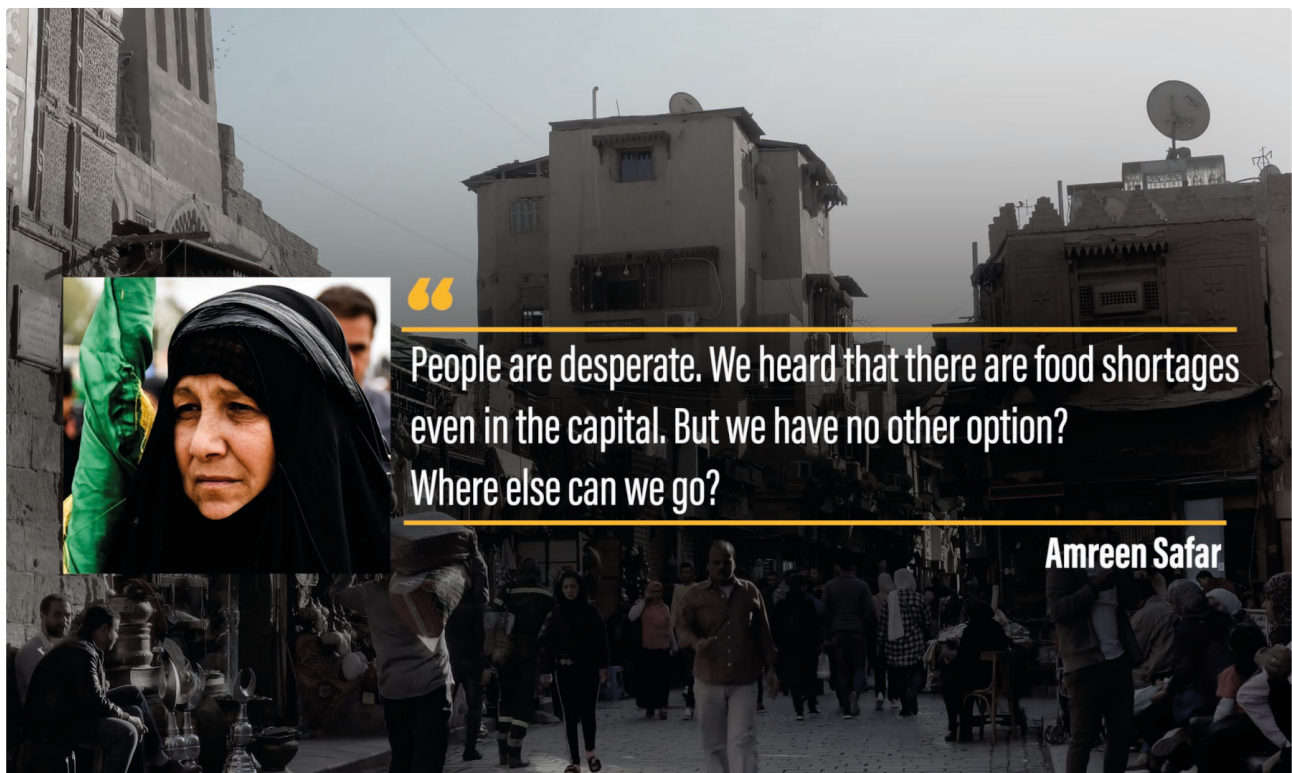
While taking part in a simulation, participants set goals that they want to achieve (“desired futures”), and then collectively explore possible strategies to reach them. These strategies, also known as pathways, are tested against a range of external scenarios that challenge the goals. This process allows the participants to understand key challenges on the way to their desired futures, as well as to develop solution options that are required to overcome them.

In a Policy Simulation process, we identify three domains (illustrated below). An arena of control is where problem owners can effectively make decisions and develop pathways to their desired futures. Problem owners can range from a small organization to a large country or region, a river basin, or a group of countries (e.g. EU). Problem owners function in a larger context of the arena of influence, where they encounter other important stakeholders. The pathways they develop can both impact and be impacted by stakeholders and their worldviews, decisions, and actions. Finally, these two arenas together function within an even larger uncertainty space, which encompasses a range of external scenarios. To ensure that their pathways are robust to the scenarios, participants look to this space and identify the most important drivers and constraints that translate to various opportunities and threats for the internal arenas.



Policy Simulations can take many different forms - both online and face-to-face, they can use computer models to provide feedback to participants based on their decisions or they can embed participants in a relevant story. Scenario-based policy simulations use an extended narrative layer to confront the participants and the pathways to desired futures that they develop with the external scenarios. They face a carefully crafted series of events. While this storyline unfolds, participants work to respond to the changing situation. The storyline is presented using a series of professionally-made videos, news articles, social media accounts, and other materials, such as maps or infographics. The storyline is created based on available scientific data and consulted with experts from the field.

Policy Simulations allow experts and practitioners coming from different backgrounds and holding different worldviews to tap into their own creativity and inventiveness; this way, they find a common ground and reach an agreement on the different aspects of their desired futures. The engaging, interactive form of the simulation helps them make the most of the different experiences, expertise, and know-how that each of them brings to the table. Many participants often reflect that after taking part in the policy simulation workshop they can see the big picture of the complex system and they understand better the collaboration mechanisms for sustainable innovation. Therefore, policy simulations offer a unique opportunity to confront different perspectives and include them meaningfully in navigating future challenges.



Screenshot from the video used in the ABM2Policy social simulation (see the description later in the text).

PROCESS STEPS

The process of a policy simulation is broken down in detail below. Although it is presented in sequential order, the process is not entirely linear - the elements are fluid and may overlap with each other during a simulation.

1 PROBLEM

Participants face a complex, real-world challenge that calls for innovative, strategic decision making and requires the integration of a wide range of data, insights, and tacit knowledge.



2 DIFFERENT PERSPECTIVES

The policy simulation provides an accessible, storyline-based representation of the problem and connects stakeholders with diverse backgrounds, values, tasks, and goals. Together, they can explore the issue from a number of perspectives that are carefully built into the backgrounds of the simulation roles.



3 COMMUNICATION

The unique setting allows participants to present their positions regarding the problem, propose their desired responses to the problem at hand, and negotiate and influence others. This leads to a free exchange of ideas and bridges communication gaps.



4 COMPLEXITY

Throughout the negotiation process, participants discover the most important variables, identify interconnections, design responses, and test how they will impact other actors and the whole system. In this process, both the problem and the consequences of possible solutions become visible in its entirety.



5 CREATIVITY

Participants discover their creative potential and go off the beaten track. Abstract ideas become tangible, opening new, original, and inspiring pathways into the unknown.



6 AGREEMENT

In the safe environment of the simulation, participants are more empathetic, trusting, and inclined towards cooperation. Thus, even if debates become heated, all voices are heard, trade-offs negotiated, and a joint policy response accepted. Even if participants' values differ, a compromise can be reached.



7 COMMITMENT TO ACTION

After finding a common ground in spite of differences, participants commit to implement their jointly developed strategy and use their experience and knowledge to face real-life challenges.



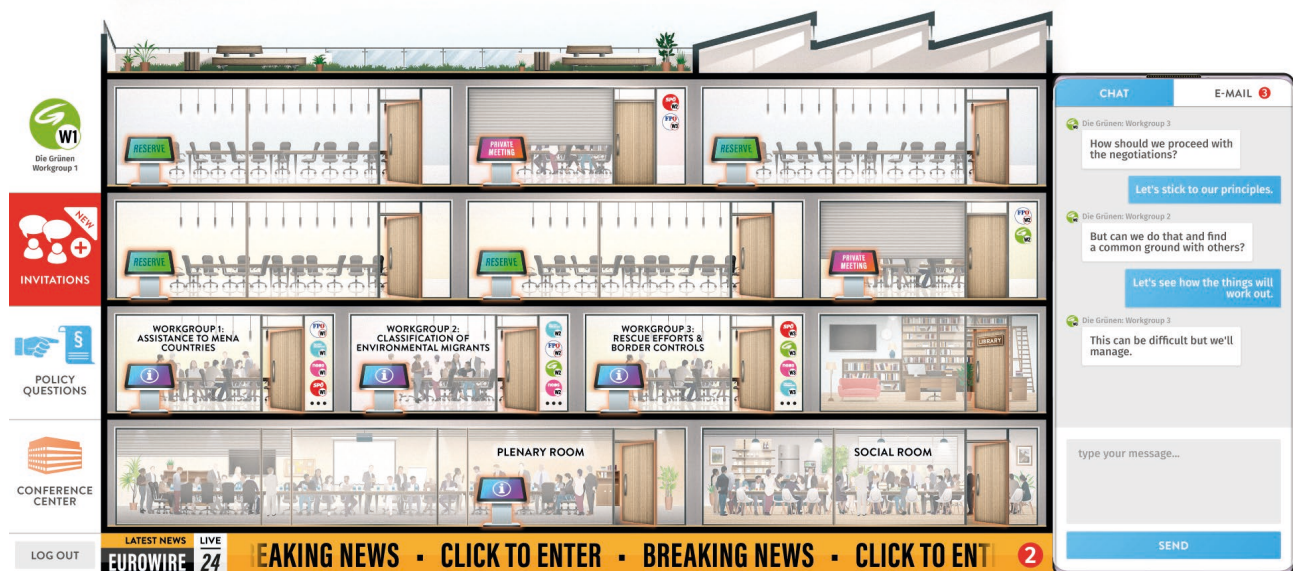
THE CLIMATE MIGRATION POLICY SIMULATION

The Climate Migration Policy Simulation addresses important, yet difficult, questions concerning immigration to Austria. It is based on a hypothetical but potentially realistic narrative scenario for the near future when the European Union and Austria may be in the wake of a (second) migration crisis. A particular focus is on 'environmental' migrants who are fleeing economic or ecological conditions worsened by climate change. The exercise is aided by an agent-based model that provides insights into the economic consequences of the migration scenario. Participants take on roles of Austrian political party representatives who discuss policy proposals that would later shape the country's response to the problem of environmental or climate immigration. The policy exercise is designed to address adversity by including diverse worldviews as one of the critical factors guiding the political debate. The participants will be able to argue for potentially conflicting

policy questions such as the status of environmental migrants, financial support for MENA countries, and participation in the Mediterranean rescue effort. The exercise enables these different views, or cultural discourses, to be represented and respected.

The negotiation process that is the main part of the simulation takes place in a virtual "conference center" as the one presented in the picture. The players will be depicted by the logos of their parties. Multiple conference rooms where participants can discuss and negotiate answers to the specific policy questions will be depicted by the names of the workgroups. Using this kind of setting creates a familiar environment for the participants, similar to what they know from real conference and consultation events.

[Learn more about the simulation](#)



ABM2POLICY PROJECT

Unanticipated migration inflows can have positive and negative economic and social consequences depending on policies implemented by the recipient country to cope with the manifold challenges. Model-based scientific assessments of in-migration on a country's national economy are hence needed, as is meaningful stakeholder deliberation of alternative policies to support the integration of refugees in ways that contribute to resilient and sustainable societies.

Hence, the ambition of the ABM2Policy project is twofold: 1) to advance the ABM methodology as applied to the Russian and Austrian national economies in order to realistically analyze migration as an external economic shock, and 2) to explore the usefulness of an ABM combined with a gamified user-interface to support the Austrian migration policy-making discussions.

In Phase I (Phase II being the policy exercise), the Austrian research team focused on applying IIASA's macroeconomic ABM, which takes account of the interactions of agents representing all Austrian residents and businesses, to analyze the economic

consequences of migration scenarios. The research team chose to focus on migration from the MENA region. Thus, the model will incorporate an explicit representation of potential migration inflows and the capability to test migration policy packages. As seen above, the study employs extensive (big) datasets, including national accounting, census, and firm-level surveys, to rigorously calibrate and validate the developed models, which have been further informed by a literature review, a survey of the conflicting policy positions of the Austrian political parties and selected stakeholder interviews.

Scenarios were jointly developed with the Joint Research Centre of the European Commission (JRC) to reflect a distribution of migrants and to take account of migrant employment in specific sectors according to Austrian migrant labor market data. Their analysis built largely on the 2015 wave of asylum seekers from Syria, Iraq, and Afghanistan (plus other statistics and literature on displaced persons and migratory flows) to generate MENA migration scenarios broken down by age, gender, education, labor force participation, and employment rates by sector.

PROJECT STAFF

International Institute for Applied Systems Analysis (IIASA)

Equity and Justice Research Group, Population and Just Societies Program

JoAnne Linnerooth-Bayer

Alberto Fresolone

Piotr Magnuszewski

Michał Pajók

Exploratory Modeling Of Human-Natural Systems Research Group, Advancing Systems Analysis Program

Elena Rovenskaya

Sebastian Poledna

Nikita Strelkovskii

Joint Research Centre of the European Commission (JRC)

Knowledge Centre on Migration and Demography

Anne Goujon

Alessandra Conte

PROJECT PUBLICATIONS

Makarov, V., Bakhtizin, A., Beklaryan, G., Akopov, A., Rovenskaya, E. , & Strelkovskii, N. (2020).
Agent-based modelling of population dynamics of two interacting social communities: migrants and natives.

Poledna, S., Miess, M.G., & Hommes, C.H. (2019).
Economic Forecasting with an Agent-Based Model. SSRN Electronic Journal 10.2139/ssrn.3484768.

Poledna, S., Miess, M.G., & Hommes, C.H. (2020).
Economic Forecasting with an Agent-Based Model. IIASA Working Paper. Laxenburg, Austria: WP-20-001.

Makarov, V., Bakhtizin, A., Beklaryan, G., Akopov, A., Rovenskaya, E. , & Strelkovskii, N. (2019).
Aggregated Agent-Based Simulation Model of Migration Flows of the European Union Countries.

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