

ASA Strategy

ASA’s relevance to the IIASA’s mission. ASA Program’s strategy responds to the IIASA’s Strategic Plan 2011-2020, which, in particular, emphasizes the need for *“innovation and exploration ... to cope with rapid changes and new crisis and opportunities”*, suggesting that *“A new infusion of advanced systems analysis models and techniques in the exploratory and innovative research projects ... will help IIASA to achieve international recognition as the leader in systems analysis and integrated assessments on a global scale.”* Being at core of ASA strategy, inter-disciplinary innovations and explorations in methodology and applications to various case-studies related to the IIASA’s global problem areas, Food & Water, Energy & Climate Change and Poverty & Equity, complement the research done by other IIASA’s applied programs.

ASA Strategy. Responding to the methodological part of IIASA’s mandate, the ASA Program’s overall mission is to advance systems analysis by substantiating the integration of systems methods and applied research on problems of global relevance and universal importance. Central to this mission is the exploratory development of mathematical methods and analytical techniques to investigate complex systems undergoing global change with a focus on an integrated, interdisciplinary approach. ***ASA research ultimately aims to produce, practice, and prototype novel system-analytical approaches, methods and tools, which allow solving problems that cannot be addressed by existing tools, or which enable addressing problems more efficiently.*** The ASA’s strategy is based on the three mutually interrelated pillars presented in Diagram 1.

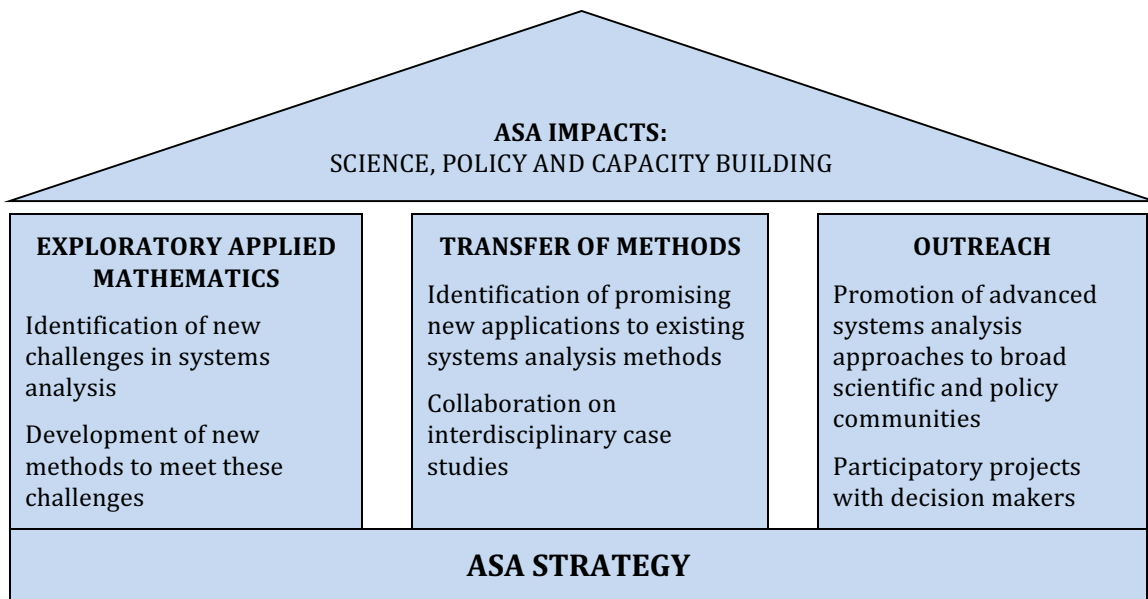


Diagram 1: Three strategic pillars of ASA.

ASA Approach. It is the approach of stylized models that is instrumental in ASA's experimenting with new methods and applications, the approach of stylized models is employed. *Stylized models are models which rely on few equations and parameters; they do not aim to capture the details, but focus on key drivers, impacts, and relations and that is why should not to be used for quantitative projection, but rather for understanding feedbacks and the role of major parameters*¹. Stylized models (i) enable exploring a new phenomenon in controlled 'laboratory conditions', (ii) help clear understanding of relations and feedbacks, (iii) provide tractable solutions, (iv) allow illustration and justification of qualitative insights, (v) ensure resource-efficiency to produce results, (vi) are easier to communicate to end-users, and (vii) provide experience and guidance for developing large-scale models. These features make the approach of stylized models most appropriate for implementing the ASA mission.

ASA researchers seek an active dialogue with the peer community of methodologists on recognized challenges and recent advances in systems analysis, as well as with applied scientists and end-users on their needs in issues related to global change. Harvesting from these dialogues, *ASA initiates and carries out collaborative, problem-oriented, small-scale exploratory research projects*. ASA maintains and develops a large network of researchers, experts and decision-makers, which are mobilized for particular projects when needed.

ASA Applications. In compliance with the overall IIASA's research agenda, each ASA project focuses on a particular system of the coupled human-environment complex and aims to

- a) reveal tendencies of its dynamics, understand the role of drivers and feedbacks, and evaluate possible impacts (descriptive analysis);
- b) suggest solutions aiming to achieve a certain objective[s] (normative and prescriptive analysis²).

The ASA mission does not constrain its applied areas – ASA researchers explore in various applied areas related to global change, relevant to the IIASA overall research agenda. *Applications are chosen where breakthroughs in terms of building at least one of the ASA strategic pillars are expected*. Application areas in which ASA researchers are currently working are presented in Diagram 2.

¹ Examples of stylized models are the Uzawa-Lukas model – a two-sector economic growth model which demonstrates the tradeoff between time allocation for enhancing human capital and production (Barro and Sala-i-Martin, Economic Growth, MIT Press, 2004) or the DICE model – an integrated assessment model linking economic growth and climate change (Nordhaus, Managing the Global Commons: The Economics of Climate Change. MIT Press, 1994) – to name a few.

² Definitions and a discussion of the role of the three types of analysis can be found in, e.g., Mandel DR (2000): On the meaning and function of normative analysis: Conceptual blur in the rationality debate? Behavioral and Brain Sciences, 23, 686- 687.

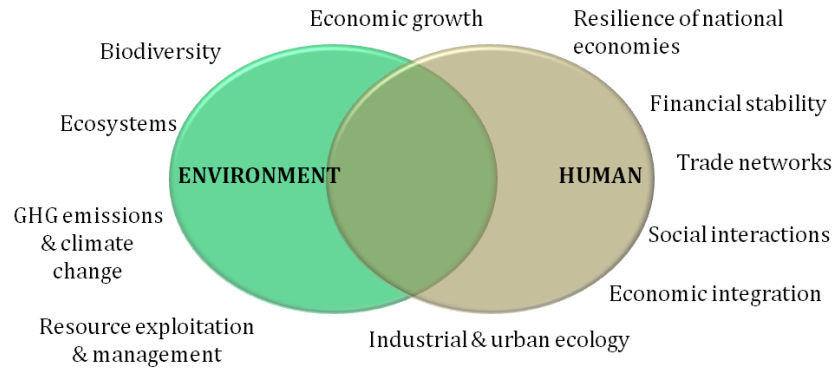


Diagram 2: Major current ASA application areas