

Feasibility Study Final Report

Title of Feasibility Study	社会-生態的加速（SEA）による20世紀グレート・アクセラレーションとその将来の理解：ヨーロッパと日本の環境史事例からの学び
	Social-Ecological Accelerations (SEA) as the key to understand the 20th-c. Great Acceleration and its possible futures: learning from case studies in European and Japanese Environmental History
FS Principal Investigator (Affiliation/Position/Name)	Nicolaus Copernicus University in Toruń/ Professor of Human Ecology / Adam IZDEBSKI
Affiliated program	Co-creation of the sustainable future based on the linkage of the earth-human system
Period of the research	April 1, 2025 – March 31, 2026

This report will be published on the RIHN website as an outcome of the FS.

There is no page limit. You may also include figures and tables as appropriate.

1 Overview of the research

Please describe the overview of the research conducted under this FS.

Since the 1950s, the world is developing at an ever-accelerating pace, bringing us on the brink of environmental collapse. While the scale of the current planetary crisis is unprecedented, phases of accelerated change were characteristic for human history. In our project, we wanted to leverage the history of Eurasia to understand better the mechanism of social-ecological accelerations (SEA) and provide scientific advice to the public, the politicians and the policy makers on how the current SEA, the Great Acceleration, may develop in the future. While the last decade produced abundant pioneering research on SEAs in Western Eurasia (Europe and the Middle East), in order to develop a more holistic understanding of SEAs we urgently need counterexamples from Eastern Eurasia (Japan). Obtaining them was the ambition of our project.

Consequently, the goal of the Feasibility Study was to transform an initial exploratory idea into a robust, groundbreaking research concept that could be framed as a practical research roadmap. In other words, our main efforts during the FS were focused on developing a Full Research proposal for RIHN. To achieve that, we formulated a clear, innovative yet fully executable methodology and research plan. We identified our concrete study areas and sites in Japan and China, we designed the methodologies and their implementation by our European-Japanese team, and we made concrete plans for the first four years (PR-FR1-3) of the Full Research phase. As a diverse cross-continental team, we reached the stage of being ready to go. All Team Members in Europe and Japan became aware of their task and prepared to carry them out. As a result, even though we were not awarded funding, we are not giving up in our efforts to carry out the planned Full Research project and we are working on obtaining the necessary funding for the different aspects of the original proposal from the JSPS and from European funding agencies.

Moreover, while working on the proposal, we also consolidated our knowledge regarding SEA phases in Japan and Europe. We finalized publications on different SEA phases in European history and, even more importantly with respect to where we stood a year ago, we identified a major SEA phase in Japanese history based on both historical as well as environmental data. A similar interdisciplinary exchange between historians and paleoecologists has never taken place in Japan before, and significantly extends the achievements of the paleoclimatologists-historians' exchanges during the NAKATSUKA project at RIHN in the previous decade, while also building on it. As such, it constituted major research progress and provided solid foundation for our FR proposal, which we hope to carry out in the near future.

We also continue our research through joint European-Japanese workshops. The first of them following the completion of the FS project is going to take place in June 2026 in Toruń, Poland, where the core Japanese and European team from the FS phase will meet to discuss in further detail SEA phases and the role of climate in cultural evolution of Europe, Central Asia and Japan. Another workshop, with a focus on the global perspectives on the SEA phenomenon is planned also in Toruń for the spring of 2027 and should lead to the first synthesis publication on the SEA phenomenon.

2 Results from the Feasibility Study

Please provide a detailed description of the research outcomes during the FS period, including methodological development and organizational formation. Please also specify any tangible deliverables. Finally, describe whether the originally planned objectives were achieved and the reasons for the outcome.

1. In May 2025, our European-Japanese FS Team convened at RIHN for an interdisciplinary workshop. **European and Japanese participants shared their respective paleoecological and historical methodologies**, and demonstrated what is achievable within each environmental and socio-cultural context.
 - 1.1. We focused on potential ways to transfer some of the paleoenvironmental research methods developed recently in Europe to Japan and adapt them to the Japanese environmental context, drawing also on the experience of the Japanese Team Members. This way we designed the plan to work in European-Japanese tandem groups, supervising the same PhD students or postdocs, and carrying out research jointly in Europe and Japan.
 - 1.2. At the same time, we went deep into the details of the historical sources in both regions of the world, investigating how they are structured, what information they contain from which time period, and how this information can be handled with digital humanities tools. This was a very important step that made our expectations with regard to what can be achieved with the Japanese written source material more concrete and realistic. This way, we could plan specific research tasks for the first years of the research of historical team in the postdoc phase.
 - 1.3. We also discussed and verified major phases of SEA in Japanese history. We combined the initial ideas from the FS application (based on existing historical demographic literature) with the existing, some very recent, paleoenvironmental data from different parts of Japan. The result was the identification of a major SEA phase at the beginning of the Kamakura period (around the year 1200 CE), with widespread deforestation across the entire archipelago and important socio-cultural developments (including new religious movements and philosophical ideas). Moreover, this SEA phase happened during a period of relatively stable climate, as indicated by the research of our FS Team Member Nakatsuka Takeshi and his RIHN project team in the previous decade. We decided that verifying the parameters, development and cultural-religious dimension of the early Kamakura SEA will be the primary goal of our historical team members in FR Phase, and important focus for our paleoenvironmental research in Japan.
 - 1.4. As part of the workshop, we also visited potential coring sites in Central Japan. We decided to settle on specific locations for our future corings (listed in the FR proposal), because of their potential for pollen

and sedaDNA (in particular rice DNA) preservation. We decided to focus our corings and paleoenvironmental analyses on Central Japan, following the model of similar studies we carried out in Europe, and rely on existing or slightly improved records for other parts of Japan (North and South). We also decided to seize the opportunity of ongoing corings in Lake Biwa and use FS funds to obtain and date sediment cores for future FR project in our core study area.

- 1.5. We also discussed potential secondary study areas in East Asia, in Korea, China, and Mongolia. We decided that the steppe/temperate zone of China and Mongolia are most promising and significant as comparative case studies, both in terms of different ecological conditions and the nature of socio-cultural and political processes.
 - 1.6. For the workshop, we invited a global environmental policy specialist from Princeton University, Dr Kate Snow, to join our FS Team and help us improve the policy relevance and engagement of our FS/FR project. Together with RIHN members attending the Workshop, we carried out extensive discussions of this issue and made significant improvements in this respect.
 - 1.7. In summary, after the workshop, we had a clear plan that we could turn into a detailed FR proposal.
2. Consequently, in August-October 2025 our team worked on **preparing the FR proposal**. The project drafted by FS Principal Investigator Adam Izdebski was then discussed and **expanded significantly by several Japanese and European members of the FS Team**. The proposal was submitted on time for the RIHN General Meeting. It contains improved theoretical concept, also for the transdisciplinary dimension, and a concrete roadmap for achieving FR goals.
 3. On top of that, during the FS phase, FS Team Members published jointly or individually **important papers on European SEA phases**, advancing or even completing research on these case studies that will serve as comparative to East Asia.
 - 3.1. This includes a paper published as a *Perspective* in the ***PNAS*** authored by Adam Spitzig, Manfred Rösch, Jessie Woodbridge, Martin Bauch, Piotr Guzowski, Peter Erhart, Ralph Fyfe, Elena Marinova, Adam Izdebski (FS Team Members underlined) entitled [*Cultural innovation can increase and maintain biodiversity: A case study from medieval Europe*](#).
 - 3.2. Two further papers cited as under review in the FS application have now been published, on the [early medieval SEA phase in Central Europe](#) and on the [SEA phase in the Roman Empire](#).
 - 3.3. The third paper on the SEA phases in the history of Europe (the early modern capitalist acceleration in the Mediterranean) has been provisionally accepted to *Nature Communications* pending minor editorial changes.