

氏 名	BARRAHMOUNE ANASS
授与した学位	博 士
専攻分野の名称	学術
学位授与番号	博甲第 7522 号
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学位授与の要件	社会文化学研究科 社会文化学専攻 (学位規則第 4 条第 1 項該当)
学位論文の題目	Does Human Depopulation Reduce Resource Consumption? Evidence from Anthropocene Japan (人類の減少は資源消費を減らすか？人新世日本からの証拠)
論文審査委員	准教授 金 志映 (主査) 教授 山口 恵子 准教授 谷口 紘也 准教授 福田 稜

学位論文内容の要旨

The thesis explores the critical issue of humanity's profound imprint on planet Earth during the still-contested Anthropocene epoch, characterized by the profound human impact on Earth systems. It focuses on Japan as a microcosm to examine the nexus of population changes, resource systems, and sustainability. In doing so, it challenges the common reductionist assumption that population growth is the primary driver of Environmental crises, arguing that societal behaviours, consumption patterns, and resource governance are equally critical. The thesis begins by framing the notion of the 'Anthropocene crisis', conceptualized as an epoch of systemic interdependencies in which human activities reshape Earth's biodiversity, ecosystems, and climate. While population growth has been typically cited as the main catalyst of this crisis, this thesis emphasizes the integral roles of societal and behavioural pathways in global consumption-driven economies. Japan's socioeconomic, demographic, and environmental trajectories provide a compelling setting for exploring how population decline and socioeconomic changes converge to influence environmental outcomes. A central contribution of the thesis is a conceptual tripartite framework of population-society-environment nexus presented in Chapter 1. This analysis critiques the reductionist view that environmental degradation is exclusively linked to population growth. It emphasizes reciprocal feedback loops among societal development, demographic shifts, and environmental impacts.

Chapter 2 offers a systematic review of Resource Nexus scholarship, focusing on the socio-demographic and geo-specific aspects of the land-food-water-energy nexus. The review highlights significant gaps in existing research, particularly the underrepresentation of demographic factors such as depopulation and migration. Meanwhile, most studies tended to overemphasize population growth and urbanization as key drivers of resource challenges. The thesis addresses this gap by exploring how depopulation interacts with resource systems, particularly in Japan's context. Additionally, the thesis also addresses another critical gap, namely the neglect of overconsumption and ensuing telecoupled environmental impacts, by examining Japan's consumption-embodied footprints within global supply-chains.

The core of the thesis lies in two empirical analyses that explore Japan's unique demographic, resource, and

environmental challenges. First, a causal Bayesian framework is used to investigate the Population-Economy-Land-Food-Water-Energy nexus. This analysis demonstrates how demographic changes influence resource systems and identifies causal relationships among these components. Key findings indicate that while depopulation theoretically reduces resource demand, systemic factors such as consumption habits and economic inertia limit these gains.

Second, a Multiregional Input-Output analysis examines the nexus of land use, virtual water demand, and greenhouse gas emissions embedded in Japan's household food consumption. This analysis demonstrates how Japan's declining population has not corresponded to shrinking environmental footprints, but instead has led to a burden-shift of these footprints to exporting countries, leading to further dependence on international resources, hence corresponding footprints. The Analysis also shows that socioeconomic change and corresponding dietary changes in Japan were the main determinants of its consumption footprints, which explains their still-growing trajectory despite a continually shrinking population.

The case of Japan examined in the thesis holds great implications for global sustainability. Japan's experience offers valuable lessons for other nations experiencing similar demographic, socioeconomic, and resource challenges. In fact, many developed and developing countries, including those in Europe, Asia, and other parts of the world face declining fertility rates and imminent realities of aging and shrinking populations. The thesis suggests that these demographic transitions can provide opportunities to rethink resource systems, but only if accompanied by systemic societal changes. The thesis also emphasizes the significance of addressing global interdependencies. As trade-dependent countries like Japan increasingly externalize their environmental footprints, global resource governance becomes increasingly vital. Therefore, global cooperation in managing transboundary resource flows and mitigating displaced environmental impacts are necessary to support the shift towards sustainability.

The thesis concludes that Japan's ongoing demographic transition provides critical insights into the complexities of the Anthropocene crisis. While depopulation offers theoretical potential for reducing resource consumption, societal and systemic factors constrain these gains. Addressing these challenges requires integrated, transformative solutions that go beyond demographic trends to encompass broader societal, economic, and governance changes.

論文審査結果の要旨

氏名：BARRAHMOUNE ANASS

学位論文題目：Does Human Depopulation Reduce Resource Consumption?

Evidence from Anthropocene Japan

人類の減少は資源消費を減らすか？人新世日本からの証拠

学位審査会開催日時：2026年 2月 3日 16時～18時

学位審査会開催場所：文法経2号館421室

本論文は、「人口減少は資源消費の抑制につながるのか」という問いを中心に、人新世 (Anthropocene) という現代的課題を背景として、日本を主たる分析対象に、人口動態と資源利用・環境負荷との関係を理論的および実証的に検討したものである。先行研究を踏まえつつ、資源ネクサスの視点を導入し、人口・社会・環境の相互連関を包括的に捉えようとする点に、本論文の学術的意義が認められる。

論文は、序論 (Introduction)、第1章から第4章、ならびに結論 (Discussion and Conclusion) から構成されており、各章はいずれも独立した論文として高い完成度を有している。一方で、論文全体としての問題意識や各章の位置づけ、相互の関係性について、より明確な説明を加える余地があるとの指摘がなされた。各章に共通する問題意識や分析結果の関係性を整理し、論文全体としての一貫性と有機的なつながりがより明確になるよう、構成および記述の整理が行われた。

また、本論文は日本という人口減少が先行する特定の国を対象とした分析であるが、審査の過程において、本研究の知見が、高所得国において一般的に想定されてきたサステナビリティに関する従来の議論や前提に対して、どのような示唆や再検討を促すものであるのかについて質問がなされた。あわせて、本研究で用いた分析枠組みや得られた知見が、他のヨーロッパ諸国や東アジア諸国など、類似の人口動態や社会経済条件を有する国々にどのように応用し得るのかについても、論文中で補足的な考察を加えることが望ましいとの提案があった。これらの点が明示され、本研究の国際的な位置づけが一層明確になった。

学位論文審査会では、各章間の関係性や論文全体の構成に加え、本研究を他国・他地域に適用した場合に共通して維持され得る分析メカニズムと、地域特性によって異なり得る要因、ならびに今後の研究展開の方向性について質疑が行われた。さらに、論文中の図13に示されたGDPの将来予測において、成長ではなく減少が示されている点について、その前提条件およびモデル構造に基づく説明が求められた。申請者は、これらの質問に対して誠実かつ概ね適切に応答し、本研究の理論的背景、実証結果の含意、および研究の限界について十分な理解を示した。

以上を総合的に判断し、審査委員会は、指摘事項を反映した修正版論文の提出を条件として、本論文を合格とすることが妥当であるとの結論に至った。