

# RESEARCH SHOWCASE



# Science, Technology and Innovation Policy

Santos, Gonçalo D., **Naubahar Sharif**, and Jack Linzhou Xing. "Translating STS in China: Disciplinary Struggles and Future Prospects." *Engaging Science, Technology, and Society* 9.1 (2023): 23-49.

This article analyzes a debate in Mainland China over how to designate and integrate the international field of STS (science and technology studies) in Chinese academia. Emerged at the turn of the millennium, this debate confirmed the increasing hold of STS in China, but it also revealed significant tensions regarding the general orientation and the place of the field in Chinese academia. These tensions reflect not only larger contradictions found in other globalized local instantiations of STS but

also Chinese specificities. To understand both dimensions, this article approaches the rise of STS in China as a creative process of translation mediated by context-specific globalized struggles and negotiations. This approach builds on Asia-focused postcolonial discussions of translational practices to capture some of the distinctive features of the field of STS in China, including the strong influence of the Marxist tradition, the continuing hold of modernist-positivist approaches, and the strong control exercised by the party-state on academia. The Chinese example is used to highlight the translational diversity of the global STS project and to raise general questions about the future of STS across borders in the twenty-first century.

Döme, Viktória, **Kira Matus**, and Weronika Cycak. "Innovation Strategies Meet Sustainable Development: Variations in Sustainable Innovation Policy Instrument Mixes of Ten Small OECD Countries Across Five Sustainability Sectors." *Social Science Research Network* 4553981.

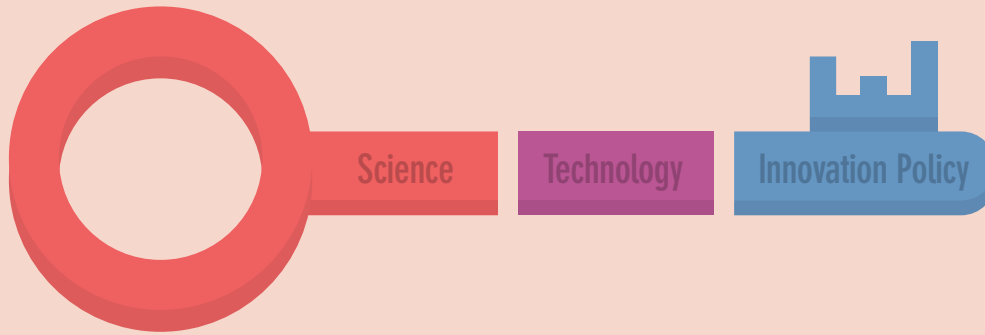
This paper provides the first comprehensive multi-sectoral and multi-country analysis, examining a dataset of 1722 sustainability-related policy interventions from 2008-2020. Three significant policy gaps that hinder innovation were identified by using FAMIS model: misalignment of national strategies and

concrete plans; lack of support for production and scale-up of technologies; limited support for technology adoption, adaptation, and retirement. It is found that countries with a mixed economic system generally used more sustainability-related policy interventions and focused on targeted R&D funding and market creation (e.g., Denmark, Sweden). Whereas countries with a market economic system largely focus on policies that support firm innovation (e.g., Israel, New Zealand) or enable a conducive environment for innovation through creating spaces, building networks, and capacity (e.g., Switzerland). Policy recommendations are offered based on these findings.

Yoshino, M., Sadlek, B., **Yarime, Masaru**, & Ali, A. (2023). Knowledge Absorption Pathways for Eco-Innovation: An Empirical Analysis of Small and Medium-Sized Enterprises in the European Union. *European Journal of Innovation Management*

This study contributes to the literature on eco-innovation (EI) and the circular economy (CE) by providing insights into the factors of external knowledge absorption that facilitate the

adoption of a subset of EIs called proactive-EIs. Proactive-EIs involve collaborations among multiple stakeholders, the use of technical knowledge and a greater level of investment than other innovations. This study observed the environmental actions taken by small and medium-sized enterprises (SMEs) in resource-intensive sectors in the European Union (EU), and elements related to the national context were compared.



Xie, Siqi, Ning Luo, and **Masaru Yarime**, “Data Governance for Smart Cities in China: The Case of Shenzhen,” *Policy Design and Practice* (2023).

This paper explores the appropriate system for governing various data in developing smart cities by investigating China’s data governance mechanisms and its distinctive institutional characteristics. Through conducting an exploratory study of the case of smart city development in Shenzhen and examining critical

opportunities and challenges in data governance. Open data platforms have been developed through close cooperation between government and technology enterprises. Regulations have been introduced to protect data security and privacy and facilitate the exchange and use of data for innovation. However, it was found that stakeholders are not sufficiently incentivized to provide accurate information, resulting in the value of data not appropriately recognized or measured, discouraging the sharing and use of data.

Papyshev, Gleb, and **Masaru Yarime**, “The Challenges of Industry Self-Regulation of AI in Emerging Economies: Implications of the Case of Russia for Public Policy and Institutional Development,” in Mark Findlay, Ong Li Min and Zhang Wenxi, eds., *Elgar Companion to Regulating AI and Big Data in Emerging Economies*, Edward Elgar, 81-98 (2023).

This paper discusses how self-regulatory approaches popular for the governance of AI can potentially be problematic for emerging economies. The findings are derived from the fieldwork conducted in Russia in 2021-2022. The key challenges include the need for more

technical expertise within the government, the lack of civil liberties, the interwovenness between the public and the private sector, the lack of motivation for ethical development, and protectionism over the local IT industry. Some initial remedies for the shortcomings of the industry self-regulation for AI in emerging economies can be found in how governments mitigate the negative effects of regulatory capture. These include promoting greater balance and diversity in the competition among different stakeholders, reforming the institutional context within which regulators operate, and opening up the regulatory process to various external checks and balances.

**Yarime, Masaru**, ed., “Data and Sustainability,” Special Collection of Articles, *Data & Policy*, Cambridge University Press (2023).

The articles in this special collection on Data Governance for Innovation for Sustainable Smart Cities and Facilitating Data-Driven Innovation for Sustainability explore policy measures and approaches to promote data-driven innovation for sustainable smart cities. Collaboration among stakeholders is crucial for collecting, sharing, and using various available data to foster innovation. However, differing interests

and motivations among stakeholders may hinder data exchange. Concerns include handling sensitive data, data security, privacy, and ethical use for behavioral change. Policy challenges encompass data ownership, accessibility, interoperability, incentives for data sharing, security, privacy, public trust, and cross-border data transfer. Innovative policy approaches like living laboratories and regulatory sandboxes are being considered. It’s vital to assess the impacts of these policy measures on driving data-driven innovation while addressing societal concerns.

# Environmental Policy and Sustainability

**Klemun, Magdalena M., et al.** "Mechanisms of hardware and soft technology evolution and the implications for solar energy cost trends." *Nature Energy* (2023): 1-12.

This paper examines the difference between hard and soft technology, nature of this difference and its implications for technology

improvement. A model is presented to study the roles of hardware and soft technology in cost evolution and apply it to solar photovoltaic (PV) systems. The usefulness of modeling dependencies between technology costs and features is shown to understand past drivers of cost change to inform future technology development.

**Zhao, Xiaofan, et al.** "Managing Extreme Rainfall and Flooding Events: A Case Study of the 20 July 2021 Zhengzhou Flood in China." *Climates* 11.11 (2023): 228.

This paper presents a case study-based approach by focusing on the record-breaking Zhengzhou flood in 2021 and examines the governance capacity of inland cities in North China for managing extreme precipitation and flooding events from the perspective of the flood risk management process. Based on an in-depth case analysis, it hypothesizes that inland cities in North China still have low-risk perceptions of extreme weather events, which was manifested

in insufficient pre-disaster preparation and prevention, poor risk communication, and slow emergency response. Accordingly, it is recommended that inland cities update their risk perceptions of extreme rainfall and flooding events, which are no longer low-probability, high-impact "black swans", but turning into high-probability, high-impact "gray rhinos." Cities must make sufficient preparation for extreme weather events by revising contingency plans and strengthening their implementation, improving risk communication of meteorological warnings, and synchronizing emergency response with meteorological warnings.

**Wen, Z., Li, H., Wang, Y., Zhao, X., & Deng, X.** (2023). Can the Implementation of Household Waste Classification Mitigate Greenhouse Gas Emissions in Beijing? A Comprehensive Analysis of Recent Trends and Future Scenarios. *Heliyon*.

This study focuses on household waste in Beijing and utilizes life cycle assessment (LCA) and material flow analysis (MFA) to calculate global greenhouse gas (GHG) emissions in waste management systems and quantify the emission reduction potential of different measures. The results show that net emissions from the classification system in 2021 are 116.77 kg CO<sub>2</sub>-eq/t waste, reducing 61.82 % compared to the traditional mixed collection and transportation system. Three scenarios are designed to explore the emission pathway of the system toward 2060. In the business-as-usual (BAU) scenario, emissions will continue to grow to 108.57 × 10<sup>4</sup> t CO<sub>2</sub>-eq/yr in 2060. In the Classification Efficiency Scenario and the Comprehensive Scenario,

emissions in 2060 will be cut to – 177.26 × 10<sup>4</sup> t CO<sub>2</sub>-eq/yr and – 702.00 × 10<sup>4</sup> t CO<sub>2</sub>-eq/yr, respectively. These results underscore the critical role of waste classification and recycling in mitigating the negative impacts of increasing waste volume. By 2060, combining waste classification with recycling can offset emissions by 803.51 × 10<sup>4</sup> t CO<sub>2</sub>-eq/yr, contributing 99 % to emission reduction potential.



## Social and Urban Policy

**He, Alex Jingwei** “Scaling-up through Piloting: Dual-Track Provider Payment Reforms in China’s Health System.” *Health Policy and Planning* 38.2 (2023): 218-227.

This paper puts forth ‘scaling-up through piloting’ as a distinctive pathway for strategically managing scaling-up in the health sector. It analyses the recent development of provider payment reforms in China, focusing particularly on the ongoing pilot programs, with data drawn from extensive documentary analysis and 20 in-depth interviews with key stakeholders,

including decision-makers and implementers. It is found that scaling up through piloting helps minimize the vast uncertainties associated with complex payment reforms and maximize the local adaptability of provider payment innovations, forging a phased implementation process, allowing new payment models to be tested, evaluated, compared, and adjusted in a full spectrum of local contexts before a national rollout. Key strategic scaling factors include necessary central steering, a pragmatic piloting design, strong technical capacity, and effective policy learning mechanisms.

**He, Alex Jingwei, Yumeng Fan, and Rui Su.** “Unpack the Black Box of Pilot Sampling in Policy Experimentation: A Qualitative Comparative Analysis of China’s Public Hospital Reform.” *Governance* (2023).

This paper elucidates the logic of selecting pilots in large policy experimentation programs. By focusing on China’s huge public hospital reform program and through a novel research design that combines comparative qualitative analysis

and illustrative case studies, the authors seek to explain the strategy for pilot selection. The analyses reveal five distinctive pathways of pilot sampling: piloting for challenge, piloting for advancement, piloting for innovation, piloting for action, and piloting for regional generalization. Each modality represents a specific experimental purpose. It is revealed that piloting is a versatile governance tool that can fulfill multiple functions in complex reforms.



**Zhu, Pengyu, et al.** “Looking Forward: The Long-Term Implications of COVID-19 for Transportation.” *Transportation Research Part D: Transport and Environment* (2023): 103910.

This editorial provides a literature review on insightful investigations on the different long-term impacts of COVID-19 on the transportation sector; the investigations are, however, inevitably limited by the fact that the pandemic is not yet far behind us. It is predicted that there will likely be long-term pandemic impacts that have not yet been fully realized,

perhaps most importantly, changes in location choices for both households and firms and resulting changes in the spatial patterns of land use in our cities and suburbs. Furthermore, individuals’ stated preferences during the pandemic may not truly reflect their revealed choices during the post-pandemic era. The lessons and insights in this special issue are hoped to provide an early look into the future, informing decision-making and planning for our changed world.

**Zhu, Pengyu, Yuqing Guo, and Praveen Maghelal.** “Does Telecommuting Influence Homeownership and Housing Choice? Evidence Based on Pre-Pandemic Data.” *Housing Studies* (2023): 1-34.

This paper analyzes the impact of telecommuting on homeownership and housing type choices by applying a three-step instrumental variable analysis to the 2009 and 2017 U.S. National Household Travel Surveys. It is shown that households with telecommuters are more likely to be homeowners and live in detached or duplex houses than their counterparts. These effects are especially

prominent for middle-aged (30–55) households. Relying on robust and national representative historical data before the COVID-19 pandemic, this study provides convincing evidence on how telecommuting affects people’s housing decisions and thus has important implications for understanding the fast-evolving housing markets in the post-pandemic era when a growing number of telecommuters look for homeownership and extract spaces to accommodate home offices. It will provide important guidance for revisiting existing housing policies for urban and rural policymakers to meet the new demand and preferences.

**Anthony B. L. Cheung and Donald Low, 2023.** “Crisis Management and Administrative Reforms: Lessons from Hong Kong and Singapore,” Chapters 11 in Shaun F. Goldfinch (ed.), *Handbook of Public Administration Reform*, pages 182-206, *Edward Elgar Publishing*.

This book chapter reflects on the crisis management experience of Hong Kong and Singapore and highlights the lessons for governments around the world. Focusing on three major crises in the 21st century – the SARS

epidemic of 2003, the Global Financial Crisis of 2008–09, and the Covid-19 pandemic of 2020–22 – it examines the efficacy of crisis responses, policy learning, adaptation, and innovation, and crisis communications. Each crisis also exposed gaps and inadequacies in their crisis responses and management systems. Their experiences suggest that policy innovation is a process of adaptation and learning from past crises. Yet cognitive deficiencies were also observed, some of them systemic and others due to biases resulting from past crisis experiences.

**Yi, Fangxin, et al.** “Time Matters in Pandemic Risk Communication: A Moderated Effect of Information Timeliness on Stakeholder Perception in Singapore.” *Risk Analysis* (2023).

This study assesses the impact of timely warning messages on stakeholders’ perceptions of public health emergencies by analyzing the survey data (N = 538) from Singapore to explore the main effect of information timeliness on the respondents’ stakeholder perceptions. This effect is moderated by normative factors, including attention and threat perceptions. It is

found that the more timely the government updates the risk information, the more trustworthy the stakeholders appear in respondents’ opinions. Such an effect is weakened when the pre-decision attention or the threat perception interacts with the predictor independently. However, this effect on stakeholder perceptions becomes stronger if both moderators interact with the information timeliness. That is, an appropriate combination of the information released by the government can effectively enhance the image of the stakeholders during the pandemic.

**Cruz, Christian Joy Pattawi, Kira Matus, and Stuart Gietel-Basten.** “The Extent of Use of Surveys in Policymaking: The Case of Hong Kong.” *Evidence & Policy* (2023): 1-22.

This paper measures the extent of survey research being used as evidence in policymaking in Hong Kong, it screened and examined Hong Kong LegCo documents utilized to enact 569 bills from 2000 to 2022 through document analysis. It is found that about 25% of bills utilized surveys as evidence, with differences across 18 policy areas and health services recorded the highest percentage of survey use in legislation. In the Hong Kong

legislature, surveys are primarily used to understand policy issues better. The mode of data collection, sample size, response rates, and representativeness of surveys are not commonly discussed in legislative documents. The study findings reaffirm previous research on the limited utilization of survey evidence in policymaking in Hong Kong, an Asian context with unicameral legislation and colonial history. The importance of survey evidence was highlighted in policy areas that directly impact the public, such as healthcare. The findings also highlight the important role of politics in investigating the use of surveys as research evidence for policymaking.

**Wang, Xinyi, Laurence L. Delina, and Kira Matus.** “Living with Energy Poverty: Uncovering Older People’s Fuel Choices in Urban China.” *Energy Research & Social Science* 104 (2023): 103247.

This paper explores the linkage between energy poverty and fuel choices. Aiming to answer the reason behind older people’s continued usage of honeycomb coal briquettes in affluent urban areas in China by analyzing older people’s subjective experiences and objective connections to their fuel use, their lived experiences with energy poverty are uncovered. The ‘Energy Cultures Framework’ is extended by including older people’s vulnerability attributes alongside their material culture, norms, practices,

and external influences. Using semi-structured interviews and participant observations in urban Wuhan, passive and active dirty fuel stacking were found among older people facing energy poverty. Passive dirty stacking is mainly caused by older energy-poor individuals’ material culture, external influences, and vulnerability attributes, whereas active dirty stacking is primarily associated with their norms, practices, vulnerability attributes, and related external factors. These findings provide strong implications for social and energy policy, particularly regarding the characterization of energy poverty, regulatory and infrastructural responses, social justice, grassroots governance, energy literacy, and cultural compatibility.