



This is a peer-reviewed, final published version of the following in press document and is licensed under Creative Commons: Attribution 4.0 license:

**Wang, Chi-Mao, Maye, Damian ORCID logoORCID:
<https://orcid.org/0000-0002-4459-6630> and Woods, Michael
(2025) Staying with the Trouble of Rural Revitalisation:
Material Agencies, More-than-Human Care, and Planetary
Rural Futures. Dialogues in Human Geography.
[doi:10.1177/20438206251396234](https://doi.org/10.1177/20438206251396234) (In Press)**

Official URL: <https://doi.org/10.1177/20438206251396234>

DOI: <http://dx.doi.org/10.1177/20438206251396234>

EPrint URI: <https://eprints.glos.ac.uk/id/eprint/15410>

Disclaimer

The University of Gloucestershire has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

The University of Gloucestershire makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

The University of Gloucestershire makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

The University of Gloucestershire accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.

Staying with the trouble of rural revitalisation: Material agencies, more-than-human care, and planetary rural futures

Dialogues in Human Geography

1–5

© The Author(s) 2025



Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/20438206251396234

journals.sagepub.com/home/dhg

Chi-Mao Wang¹ , Damian Maye² , and Michael Woods³ 

Abstract

This response engages Chen et al.'s (2025) intervention into our planetary rural geographies framework, which rethinks rural-urban relations through material and more-than-human agencies. We welcome their emphasis on infrastructure's role, particularly in China's rural construction movement. Extending this, we highlight how materials – chemicals, soils, atmospheric elements – shape uneven planetary transformations. Drawing from metabolic politics and critical agrarian studies, we trace how earthly substances entangle rural assemblages in toxicity, dispossession, and ecological crisis. While rural revitalisation proliferates globally, we caution against anthropocentric models that reproduce harm. Instead, we call for ethics of care rooted in human-nonhuman reciprocity, land stewardship, and intergenerational solidarity – advancing the planetary rural geographies agenda through attention to more-than-human entanglements and shared planetary responsibilities.

Keywords

Planetary rural geographies, rural revitalisation, more-than-human, infrastructure, materials

Introduction

We are very grateful to Chen et al. (2025) for their thoughtful engagement with our work on planetary rural geographies (Wang et al., 2025). Their analysis of China's rural construction movements meaningfully extends the dialogue between critical infrastructure studies and planetary rural geographies. We especially appreciate their attention to how infrastructure actively configures rural-urban dynamics, complicating linear, urban-centric narratives of rural-urban relations.

Their emphasis on the political agency of more-than-human actors aligns with, and enriches, our original proposal. We build on their intervention by further stressing the significance of nonhuman

materials – chemicals, soils, water, rocks, and atmospheric elements – in shaping rural-urban entanglements. This perspective foregrounds how

¹Department of Bio-Industry Communication and Development, National Taiwan University, Taipei, Taiwan, (R.O.C.)

²Countryside and Community Research Institute, University of Gloucestershire, Francis Close Hall Campus, Cheltenham, UK

³Department of Geography and Earth Sciences, Aberystwyth University, Aberystwyth, UK

Corresponding author:

Chi-Mao Wang, Department of Bio-Industry Communication and Development, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd. Taipei, 106 Taiwan, (R.O.C.).

Email: chimaowang@gmail.com

planetary ruralisation and urbanisation processes are materially constituted, often producing uneven transformations across both the Global North and South.

While we recognise revitalisation efforts aimed at addressing planetary rural crises, we caution that projects guided by anthropocentric logics risk undermining both peasant livelihoods and more-than-human life. We advocate for an ethics of care grounded in reciprocity, stewardship, and intergenerational solidarity, attentive to planetary responsibilities and material agencies. Through this dialogue, we seek to deepen and extend the analytical and ethical horizons of the planetary rural geographies framework.

Bouncing off Chen et al. (I): Thinking through infrastructure

Building on recent work in critical infrastructure studies, Chen et al. (2025) argue that China's rural construction movement (RCM) aims to expand infrastructure and address rural-urban inequalities. Yet, these efforts often reconfigure rural spaces into sites of crisis, unfolding amidst broader planetary processes of rural depopulation, land abandonment, and ecological degradation (Feng et al., 2025; Shattuck et al., 2023; Vorbrugg, 2025). These socio-ecological crises, deeply entangled with global circuits of capital and governance, have prompted varied interventions from state and non-state actors.

China's rural revitalisation is part of a broader global trend, seen in initiatives such as the EU's LEADER programme (Shucksmith et al., 2021), Japan's *mura okoshi undo* (Hisano et al., 2018), South Korea's *Saemaul Undong* (Sonn and Gimm, 2013), and Thailand's One Tambon, One Product initiative.

Despite differing in form, these programmes share a vision of the rural as distinct from urban and under threat from planetary urbanisation. They involve redistributing resources (Xin and Deng, 2025), facilitating counter-urbanisation (Bosworth and Finke, 2020; Stockdale, 1992), and reshaping rural materialities and temporalities (Chen et al.,

2025). In line with our planetary rural geographies approach, we caution that revitalisation projects – though framed as solutions – often embody anthropocentric logics and can become new sources of crisis. These interventions must be examined through more-than-human entanglements involving plants, animals, microbes, soils, chemicals, and atmospheric processes. We argue that rural transformation is not just social or economic, but also ecological and ontological.

Furthermore, Chen et al.'s (2025) focus on infrastructure helpfully elaborates a dimension of planetary rural geographies that we touched on lightly in our original paper – the fundamental function of infrastructural technologies and networks in assembling and enacting the planetary rural. Their call for comparative studies of rural infrastructural geographies can provide insights into global unevenness from a more pluralist, non-western-centric perspective. However, while Chen et al. note that 'infrastructures can cause power to bring various human and non-human actors into intimate conversation with one another', like other studies they treat China's rural construction movement as a human-driven political project in which infrastructure is both a tool and an outcome (Liu et al., 2020; Long, 2020; Xin and Gallent, 2024).

Fully following our planetary rural geographies approach, we challenge Chen et al. to think further about the vibrant materialities (Bennett, 2010) of China's rural infrastructure and the more-than-human agency produced through these. What happens when the vibrant materialities of rural infrastructure enact outcomes that escape the intentions of state policy? What happens when infrastructures fail? More than just a socio-economic programme, China's RCM should be viewed as a struggle to harness and form alliances with lively non-human elements from soil to water to seed to solar energy.

Furthermore, the agency emanating from China's rural infrastructure has affects far beyond the immediate locality. The rapid expansion of renewable energy infrastructure in rural China, for instance, has truly global impacts, giving hope in the context of the climate crisis. At the same time, technologies employed in this infrastructure are dependent on

supply chains for rare earths and metals that link back to rural mines in Africa, South America, Europe, and Australia, often at a cost to the local environment (Barbesgaard and Whitmore, 2024; Deberdt and DiCarlo, 2024; Meehan *et al.*, 2025). Interrogating infrastructural geographies can illuminate the tension we identified between hope and crisis in the planetary rural.

Bouncing off Chen *et al.* (2): Material agency and metabolic politics

While we welcome Chen *et al.*'s (2025) attention to material agency, the planetary rural geographies framework emphasises how planetary materialities shape rural-urban dynamics. Land consolidation and agricultural industrialisation – intertwined with the use of fertilisers, pesticides, and agrochemicals – contribute to land dispossession, soil and groundwater degradation, biodiversity loss, novel zoonotic and plant diseases, and environmental toxicity (Barua, 2025; Guthman, 2019; Krzywoszynska, 2019; Landecker, 2019). Responding to Chen *et al.*'s focus on infrastructure, we explore how material agency reconfigures rural assemblages.

Recent work on metabolic politics helps trace the transformations wrought by rural industrialisation, especially in livestock systems. Departing from classical Marxian metabolism, this scholarship highlights how shifts in biochemical flows destabilise rural-urban relations (Barua, 2025). Landecker (2019) shows how industrial waste like arsenic and antibiotics – once pollutants – became repurposed as animal feed, mobilising animals' metabolisms to manage surplus while spreading toxicity across ecosystems. For instance, arsenical drugs introduced in 1944 to combat parasites in poultry enabled indoor farming but introduced hazardous compounds – roxarsone, arsanilic acid – into food and soil. These were eventually banned in the U.S. due to health concerns (Nachman *et al.*, 2017). Similarly, in China, industrialised pig farming has contaminated rural soils with heavy metals and antibiotics (Wang *et al.*, 2024; Zhang *et al.*, 2022). Tracing these circulations reveals how biochemical

transformations sustain rural-urban inequality and power asymmetries across space and time (cf. Chen *et al.*, 2025).

Long before current revitalisation trends, marginalised communities in the Global South faced anthropocentric development interventions. Since the 1950s, Bangladesh has hosted experimental rural projects, including climate adaptation initiatives (Dewan, 2021; Paprocki, 2021). Historically, monsoonal floods supported agriculture, but 1960s donor-funded 'flood protection' schemes raised riverbeds and increased flood vulnerability. Activists also criticised shrimp aquaculture – promoted by aid agencies – for weakening embankments and enabling land dispossession. In India, Green Revolution farming brought similar disruptions. In Madhya Pradesh, the 1990s soybean boom eliminated monsoon fallows, disrupted aquifer recharge, and increased farmers' exposure to market and climate shocks (Jodhka, 2021; Shattuck *et al.*, 2023).

Bouncing off Chen *et al.* (3): Planetary futures of care and hope


In their commentary, Chen *et al.* (2025) draw on our conceptualisation of planetary rural geographies as spaces of crisis, conflict, and hope to position China's RCM as nourishing rural hope. At one level, this is correct. China's rural revitalisation policies have been a tremendously hopeful development, dramatically reducing rural poverty, slowing rapid urbanisation and its ecological consequences, and creating a viable rural future for millions of people. The impacts of the programme have been planetary in scope and, as we noted earlier, it is paralleled by similar initiatives for rural regeneration across the world.


However, rural construction in China and its equivalent initiatives elsewhere are nonetheless political programmes that have been conceived for and around human constituencies. We remain deeply concerned about rural revitalisation projects that are shaped by anthropocentric logics and closely tied to processes such as land consolidation and the industrialisation of agriculture. In contrast, planetary rural geographies calls for multispecies


justice rooted in care: sustaining rural-urban kinship networks (Rigg et al., 2018), ethical obligations to nonhuman others (Kallio and LaFleur, 2023), and multispecies justice (Celermajer et al., 2021).

As Haraway (2016) reminds us, ‘staying with the trouble’ means embracing our entanglements with place, matter, and time – not just securing future safety. One compelling example is the Japanese *Satoyama* revitalisation movement, which re-imagines humans as co-creators of the landscape alongside pines, matsutake mushrooms, and other species – woven into the ecosystem as part of, rather than apart from, nature. We welcome Chen et al.’s contribution to advancing the planetary rural geographies research agenda through their engagement with rural revitalisation and infrastructure, and their suggestion for global comparative analyses to examine these planetary relations. In support of this argument, we underscore here a growing urgency for this further research to move beyond anthropocentric models of revitalisation and toward more-than-human frameworks of care.

ORCID iDs

Chi-Mao Wang  <https://orcid.org/0000-0002-5125-230X>

Damian Maye  <https://orcid.org/0000-0002-4459-6630>

Michael Woods  <https://orcid.org/0000-0003-3813-4138>

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Economic and Social Research Council, National Science and Technology Council (grant number ES/W000210/1, MOST 110-2923-H-002-003-MY2, MOST 111-2423-H-002-005-MY4).

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

- Barbesgaard M and Whitmore A (2024) “Blood on the floor:” The nickel commodity frontier and inter-capitalist competition under green extractivism. *Journal of Political Ecology* 30: 5458.
- Barua M (2025) Metabolic geographies: Work, shifts and politics. *Progress in Human Geography* 49(2): 145–163.
- Bennett J (2010) *Vibrant Matter: A Political Ecology of Things*. Durham: Duke University Press.
- Bosworth G and Finke HB (2020) Commercial counterurbanisation: A driving force in rural economic development. *Environment and Planning A-Economy and Space* 52(3): 654–674.
- Celermajer D, Schlosberg D, Rickards L, et al. (2021) Multispecies justice: Theories, challenges, and a research agenda for environmental politics. *Environmental Politics* 30(1–2): 119–140.
- Chen N, Kong L and Li Y (2025) Infrastructuring planetary rural geographies: A view from China’s rural construction movement. *Dialogues in Human Geography* 0(0): 20438206251364983. <https://doi.org/10.1177/20438206251364983>.
- Deberdt R and DiCarlo J (2024) Pericentricity on the Congolese copperbelt: How the DRC shapes Chinese cobalt supply chains and the low-carbon transition. *Globalizations* 21(8): 1496–1517.
- Dewan C (2021) *Misreading the Bengal Delta: Climate Change, Development, and Livelihoods in Coastal Bangladesh*. Seattle: University of Washington Press.
- Feng Z, Robinson GM and Tan Y (2025) Rural revitalization in China: Reversing rural decline and eliminating poverty. *Geography Compass* 19(7): e70039.
- Guthman J (2019) *Wilted: Pathogens, Chemicals, and the Fragile Future of the Strawberry Industry*. Oakland, CA: University of California Press.
- Haraway DJ (2016) *Staying with the Trouble: Making Kin in the Chthulucene*. Durham: Duke University Press.
- Hisano S, Akitsu M and McGreevy SR (2018) Revitalising rurality under the neoliberal transformation of agriculture: Experiences of re-agrarianisation in Japan. *Journal of Rural Studies* 61: 290–301.
- Jodhka SS (2021) Why are the farmers of Punjab protesting? *Journal of Peasant Studies* 48(7): 1356–1370.
- Kallio G and LaFleur W (2023) Ways of (un)knowing landscapes: Tracing more-than-human relations in regenerative agriculture. *Journal of Rural Studies* 101: 103059.

- Krzywoszynska A (2019) Caring for soil life in the anthropocene: The role of attentiveness in more-than-human ethics [10.1111/tran.12293]. *Transactions of the Institute of British Geographers* 44(4): 661–675.
- Landecker H (2019) A metabolic history of manufacturing waste: Food commodities and their outsides. *Food Culture & Society* 22(5): 530–547.
- Liu Y, Zang Y and Yang Y (2020) China's rural revitalization and development: Theory, technology and management. *Journal of Geographical Sciences* 30(12): 1923–1942.
- Long H (2020) *Land Use Transitions and Rural Restructuring in China*. Singapore: Springer Singapore.
- Meehan P, Sadan M and Lawn DS (2025) The Myanmar borderlands as a green energy transition 'sacrifice zone': A case study of rare earth mining in Kachin state. *The Extractive Industries and Society* 22: 101579.
- Nachman KE, Ginsberg GL, Miller MD, et al. (2017) Mitigating dietary arsenic exposure: Current status in the United States and recommendations for an improved path forward. *Science of the Total Environment* 581: 221–236.
- Paprocki K (2021) *Threatening Dystopias: The Global Politics of Climate Change Adaptation in Bangladesh*. Ithaca, NY: Cornell University Press.
- Rigg J, Salamanca A, Phongsiri M, et al. (2018) More farmers, less farming? Understanding the truncated agrarian transition in Thailand. *World Development* 107: 327–337.
- Shattuck A, Grajales J, Jacobs R, et al. (2023) Life on the land: New lives for agrarian questions. *The Journal of Peasant Studies* 50(2): 490–518.
- Shucksmith M, Brooks E and Madanipour A (2021) LEADER and spatial justice. *Sociologia Ruralis* 61(2): 322–343.
- Sonn JW and Gimm D-W (2013) South Korea's Saemaul (new village) movement: An organisational technology for the production of developmentalist subjects. *Canadian Journal of Development Studies / Revue Canadienne D'études du Développement* 34(1): 22–36.
- Stockdale A (1992) State intervention and the impact on rural mobility flows in Northern Ireland. *Journal of Rural Studies* 8(4): 411–421.
- Vorbrug A (2025) What is the place of abandonment in planetary rural geographies? *Dialogues in Human Geography* 15(3): 433–436.
- Wang CM, Maye D and Woods M (2025) Planetary rural geographies. *Dialogues in Human Geography* 15(3): 394–413.
- Wang Y, Wang Y, Shao T, et al. (2024) Antibiotics and microplastics in manure and surrounding soil of farms in the Loess Plateau: Occurrence and correlation. *Journal of Hazardous Materials* 465: 133434.
- Xin S and Deng H (2025) Beyond entrepreneurship: China's emerging party-statecraft of rural revitalization. *Habitat International* 156: 103277.
- Xin S and Gallent N (2024) Conceptualising 'neo-exogenous development': The active party-state and activated communities in Chinese rural governance and development. *Journal of Rural Studies* 109: 103306.
- Zhang X, Gong Z, Allinson G, et al. (2022) Environmental risks caused by livestock and poultry farms to the soils: Comparison of swine, chicken, and cattle farms. *Journal of Environmental Management* 317: 115320.