









# Translocal social resilience dimensions of migration as adaptation to environmental change

Patrick Sakdapolrak<sup>a,b,1</sup> , Harald Sterly<sup>a</sup> , Marion Borderon<sup>a</sup> , Simon Bunchuay-Peth<sup>a</sup> , Sopon Naruchaikusolf<sup>c</sup>, Kayly Ober<sup>d</sup>, Luise Porst<sup>e</sup> , and Till Rockenbauch<sup>f</sup> 

Edited by Ricardo Safra de Campos, University of Exeter, Exeter, United Kingdom; received April 20, 2022; accepted March 6, 2023 by Editorial Board Member William C. Clark

There is growing recognition of the potential of migration to contribute to climate-change adaptation. Yet, there is limited evidence to what degree, under what conditions, for whom, and with which limitations this is effectively the case. We argue that this results from a lack of recognition and systematic incorporation of sociospatiality—the nested, networked, and intersectional nature of migration-as-adaptation. Our central objective is to utilize the translocal social-resilience approach to overcome these gaps, to identify processes and structures that shape the social resilience of translocal livelihood systems, and to illustrate the mechanisms behind the multiplicity of possible resilience outcomes. Translocal livelihood constellations anchored in rural Thailand as well as in domestic and international destinations of Thai migrants serve as illustrative empirical cases. Data were gathered through a multisited and mixed-methods research design. This paper highlights the role of the distinct but interlinked situations and operational logics at places of origin and destination, as well as the different positionalities and resulting vulnerabilities, roles, commitments, and practices of individuals and households with regard to resilience. Based on the empirical results, the paper distills a generalized typology of five broad categories of resilience outcomes, which explicitly considers sociospatiality. Our approach helps to grasp the complexity of migration-as-adaptation and to avoid simplistic conclusions about the benefits and costs of migration for adaptation—both of which are necessary for sound, evidence-based, migration-as-adaptation policymaking.

climate mobilities | adaptation | translocality | migration

The capacity to adapt to shocks and challenges has been identified by sustainability sciences as one of the key capacities to support development pathways toward sustainability (1). Migration is increasingly acknowledged to have the potential to function as a means of adaptation to climate change (2–5). Reflecting the insights of sustainability sciences on the role of resources, heterogeneity, and connections as key determinants of adaptive capacity (1), migration-as-adaptation builds on the basic premise that households spread risks, maintain, and increase well-being by drawing on migration to spatially and sectorally diversify their livelihoods' bases, and to access financial and social remittances, especially if they are typically reliant on rainfed agriculture for their livelihoods (6–10). Burnham and Ma (11) and Wiederkehr et al. (12) in their reviews of empirical evidence have highlighted the significance of migration-as-adaptation: 40% of studies on smallholder climate-change adaptation in Asia, Africa, and South America mentioned migration as a risk-mitigation strategy (11), and one-quarter of rural households in the meta-analysis by Wiederkehr et al. (12) rely on migration as an adaptation strategy. An estimate by the International Fund for Agricultural Development (13) states that every ninth person globally is dependent on remittances from international migrants for securing livelihoods.

Despite the growing interest in migration-as-adaptation, the understanding of how, for whom, and under what conditions migration is contributing to adaptation is still limited and scattered, and important aspects remain understudied: first, most research remains focused on “climate migrants” and “adaptive migration”—migration as an outcome of, and a reaction to climate risks and hazards (14)—while neglecting the networked and connected nature of vulnerabilities (14: 150) and the consideration of existing migration as an already integral part of many livelihood systems (15, 16). Second, while there is an increasing acknowledgment of the (often urban) places of destination for understanding migration as adaptation (17–20), an assessment of migration-as-adaptation through an integrated conceptualization of both places of origin and destination is still rare (8, 21, 22). Third, many assessments of the potential of migration for adaptation are conflating the outcomes of migration in at least one or several of the following: space, social scale, intersectional difference, key thematic dimensions (social, economic, ecologic), and time (23).

## Significance

The contribution of migration to climate-change adaptation is increasingly acknowledged. But, the understanding of the mechanisms and the assessment of outcomes are still limited due to the lack of systematic consideration of the nested, networked, and intersectional nature of the livelihoods of migrants and their households. The paper introduces the translocal social resilience approach for an improved understanding of migration-as-adaptation and thereby provides a path for creating sound empirical evidence needed for migration-as-adaptation policymaking.

Author contributions: P.S., H.S., S.B.-P., S.N., K.O., L.P., and T.R. designed research; P.S., H.S., S.B.-P., S.N., K.O., L.P., and T.R. performed research; P.S., H.S., S.B.-P., S.N., K.O., L.P., and T.R. contributed new reagents/analytic tools; P.S., H.S., M.B., S.B.-P., S.N., K.O., L.P., and T.R. analyzed data; and P.S., H.S., M.B., S.B.-P., S.N., K.O., L.P., and T.R. wrote the paper.

The authors declare no competing interest.

This article is a PNAS Direct Submission. R.S.d.C. is a guest editor invited by the Editorial Board.

Copyright © 2024 the Author(s). Published by PNAS. This open access article is distributed under Creative Commons Attribution-NonCommercial-NoDerivatives License 4.0 (CC BY-NC-ND).

Although PNAS asks authors to adhere to United Nations naming conventions for maps (<https://www.un.org/geospatial/mapsgeo>), our policy is to publish maps as provided by the authors.

<sup>1</sup>To whom correspondence may be addressed. Email: patrick.sakdapolrak@univie.ac.at.

Published January 8, 2024.

The central objective of this paper is to utilize the translocal social-resilience (TSR) approach to overcome these gaps and identify processes and structures that shape the social resilience of translocal livelihood systems, as well as to show the mechanisms behind the multiplicity of resilience outcomes. In doing so, the paper will help to better comprehend the full complexity of migration-as-adaptation and to avoid simplistic conclusions about benefits and cost of migration for adaptation—both of which is necessary for sound and evidence-based migration-as-adaptation policymaking.

**Toward Operationalizing Translocal Social Resilience.** A comprehensive understanding of migration-as-adaptation requires a broadening of the view, beyond seeing migration as a mere response to climate stress, and must disentangle the resilience outcomes of various forms of migration—along the spatial axis (places of origin and destination) on the one hand, and in terms of social scales (households, individual) and intersectional positionality (gender, age, class, etc.) on the other hand. We propose a TSR approach to overcome these limitations in studying migration-as-adaptation (8). Translocal social resilience builds on the conceptualization of social resilience as the capacity of social units to cope with adverse events or conditions without intolerable losses; to adapt to such events or conditions; and to transform their social, political, economic, and/or ecological environments in the context of risks and perturbations, to maintain and increase their well-being. This conception differs from the ecosystem-based definition in that it includes an actor perspective and the capacity of (individual or collective) actors to comprehend and consciously adapt or transform their own or higher-order systems, including the vulnerability context and its drivers. It also remains more open, as it does not preconceive thresholds that need to be crossed in order for a household or community to undergo substantial change (24–27). We expand this definition by adding an explicit sociospatial dimension, defining translocal social resilience as the capacity of a livelihood system, which is translocally connected and embedded through its mobile and immobile actors, to diversify and broaden access to resources to cope with, adapt to, and transform in the context of stress and perturbation, and to take opportunities to maintain or increase livelihood security and to decrease vulnerability (21, 22).

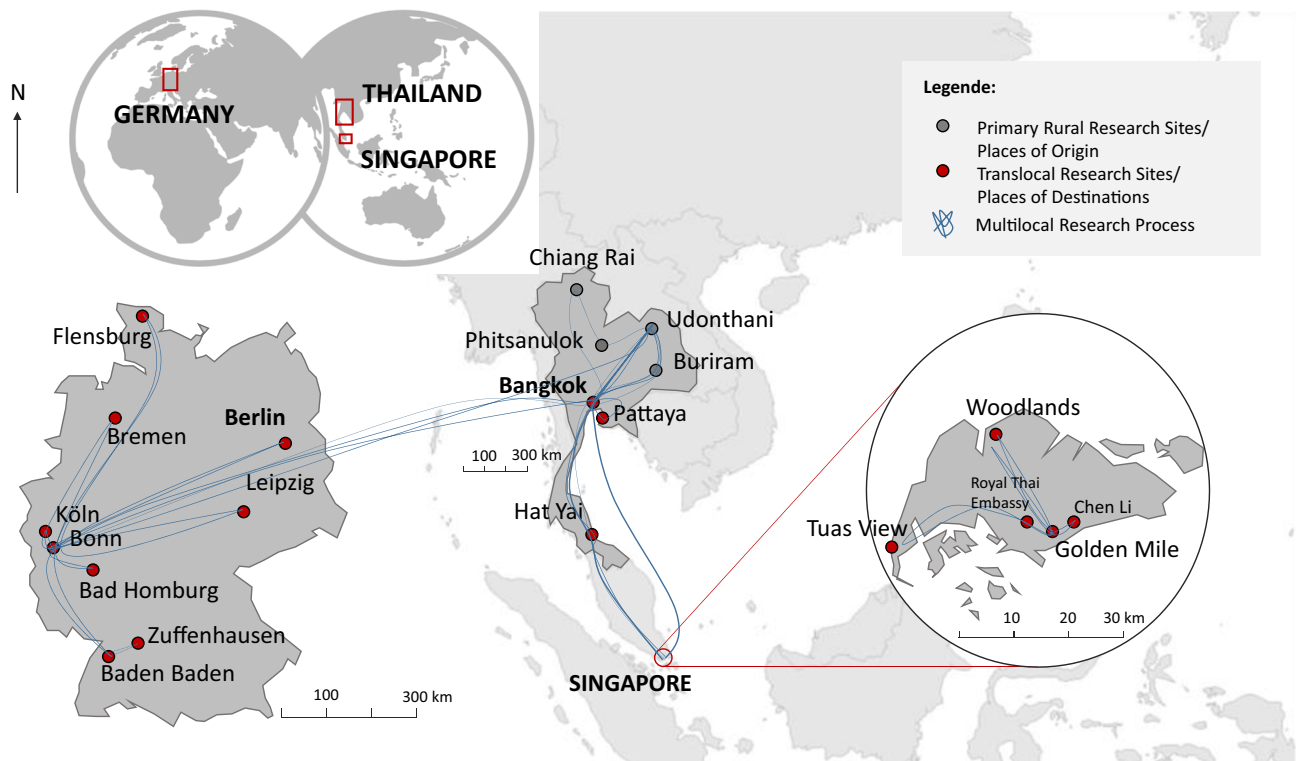
This perspective is based on three principal angles: First, translocal social resilience is understood as intrinsically related to social practices (28). The emerging translocal livelihood pathways are considered as resulting from the interplay of structural properties and human agency (29, 30): The former refers to the embedding of both migrants' and nonmigrants' livelihoods in unequal local and translocal social–ecological and political–economic contexts of risks and possibilities, and the latter refers to the choices, freedoms, and capabilities, and to the practices and strategies of mobile and immobile actors with regard to present and future risks and uncertainties (31). Second, instead of spatially bounded households, translocally situated livelihood formations are the key units of analysis (32, 33), which incorporate the migrants and migrant households at places of destination, and the household (part) at the place of origin as a networked social unit (21). With the concept of translocality (34–36), we emphasize migrants' simultaneous embeddedness in origin and destination places, and the multidimensional and continuing links and connections between migrants and their places of origin, and the resulting social networks and sociospatial interdependencies (37–40). Third, these translocal livelihood configurations of migrants and nonmigrants are considered as embedded in social–ecological and socioeconomic systems (41).

The social networks, relations, and positionalities, in which both migrants and nonmigrants are embedded, are preconditions for, as well as outcomes of local and translocal social practices, and are the basis for translocal flows and exchange. Understanding these systems necessitates taking into account local and translocal networks; multiple social scales (42); intersectional differences (16, 43, 44); the three key dimensions of social, economic, and ecological migration outcomes (45, see also 46); as well as the time horizon of system trajectories. By including these three dimensions of sustainability and time, we avoid serious conflations (e.g., assessing generalized migration outcomes without considering the possibly large differences between economic and social dimensions, or looking only at short-term effects without considering longer-term demographic or ecological effects), and we open the concept of social resilience up for stronger integration with sustainability science.

## 1. Results

The insights into the various TSR dimensions of migration-as-adaptation presented in this article are based on a multisited and mixed-methods research design in four remote rural sub-districts in Thailand and Bangkok Metropolitan Region, as well as in Singapore and Germany as international destinations of Thai migrants (Fig. 1). Qualitative and quantitative data were gathered through surveys, participatory rural appraisals and focus-group discussions, semi-structured interviews, as well as social-network analysis. The multisited research design enabled the linking of data from the origin and destination places of translocal households for a subsample of internal as well as international migrants (*Materials and Methods*). Thailand is regularly exposed to environmental risks, and is ranked in the top 10 list of countries most affected by climate change over the last two decades (47). Significant parts of rural Thailand are still dominated by small-scale rainfed agriculture, but a high degree of on- and off-farm diversification can be observed, and migration—both internal and international—is an inherent part of rural livelihoods (48). Since the 1960s, domestic migration in Thailand has increased considerably, with the industrial development in and around Bangkok and the Eastern Seaboard, and with the tourist destinations in the south of the country becoming key destinations. The two international destinations included in the study represent two highly contrasting migration systems: labor migration to Singapore, with its highly regulated immigration regime, is characterized by male migrants into the construction and port sector on protracted short-term contracts (49). Contrasting that, migration to Germany is mainly marriage migration of Thai women—87% of the 60,000 Thai nationals in Germany are women (50), and the majority are married to Germans—with the prospect of long-term settlement (51).

The main source of livelihoods of the households in the four rural study areas is agriculture (48% of households report agriculture as the main source of income, with an average of 62% of income from agriculture) (Table 1). While most households grow rice for own consumption and sale, a considerable on-farm diversification can be observed, with a growing importance of cash crops (especially sugar cane, rubber, and maize). Sixty-four percent of the households are engaged in off-farm activities. Households report being affected by a range of environmental risks and extreme events, most importantly extended dry spells, floods, erratic rain, and temperature extremes. The study sites, although rural and marginal places by national standards, are intensively embedded in migration networks: 53% of households reported



**Fig. 1.** Study locations in Thailand, Singapore, and Germany.

that at least one household member was currently migrating or had done so in the past within Thailand, 6% had migrated overseas/internationally, and 15% had migration experience both within Thailand and overseas. Important domestic destinations included Bangkok and its vicinity, and the coast including the Eastern Seaboard, but also the same or neighboring provinces. The top four international destinations were Taiwan, South Korea, Singapore, and Israel (Fig. 2). While more men migrate internationally than women (77% vs. 23%), the gender ratio of domestic migrants is more balanced (54% vs. 46%). International migration yields much more transfers than domestic migration but is accessible for fewer households: While 37% of all households reported receiving domestic remittances, averaging roughly 1,200 USD annually, only 9% of households received international remittances—however, these averaged 6,250 USD annually.

#### **Simultaneous Local Embeddedness and Translocal Connectedness.**

Based on the multisited research on internal and international migration, three intertwined interactions of structures and processes that condition the adaptation outcomes of translocal livelihood systems could be identified: the degree of choice in migration decision-making and translocal livelihood pathways, the embedding and social positioning in places of origin and destination, and the degree and dynamics of connectedness between migrants and their households. In our empirical study, we observed migration and translocal livelihood constellations to contribute to adaptation in several, distinct ways: i) in the form of directed, adaptive actions in agricultural livelihoods at the site of origin, for example enabling intensification and the change to cash crops, shifting to less labor- and cost-intensive agricultural practices (e.g., the shift from rice transplanting to rice broadcasting to avoid losses from increasingly frequent dry spells), or the introduction of organic farming; ii) as an adaptive strategy for spatial and sectoral risk-diversification that increases coping capacity against environmental and other risks; and iii) through the reduction of vulnerability, by increasing and

diversifying income, and by improving households' asset base over time, including investment in education of children.

The migration decision-making and translocal livelihood pathways are largely shaped by the socioeconomic situation within the household at the place of origin, and hence by a spectrum of needs, aspirations, and capabilities to migrate (52, 53): for more than half of our interviewed domestic migrants, migrating to find work and secure livelihoods was driven by the necessity to earn income, in addition to the usually unstable income from small-scale agricultural production (54). Although the latter is exacerbated by climate change (55), interviewees considered increasing costs for education, health, and general expenditures in combination with decreasing revenues from farming as much stronger factors. The need for migration was in some cases also temporary or short term, for example driven by the costs of children's higher education, or investment costs for housing improvement, agricultural inputs, or consumer goods. When migration was happening out of need, it was often associated with precarious working and living conditions of the migrants and—except when taking place temporarily and with a specific purpose—with little improvement at the place of origin. In such cases, the operational logic of the household level was dominant over that of the individual, and either migration decisions were taken jointly, or individuals perceived an obligation to migrate to sustain the household (56).

On the other side of the spectrum, when households' socioeconomic situations were stable and the economic and labor input by the migrating individuals were not a necessity for sustaining livelihoods, domestic migration decisions were taken by choice rather than out of need. The degree of migrants' support of their parents or family at the place of origin depended on their relation with the place of origin—for example through kinship or filial bonds, ownership of land or property, or a sense of belonging and identity (54). As migrants from these better-off households often had better education and thus higher incomes, and households

**Table 1. Household characteristics**

Share of HH who own land	81%
Average size of land owned, ha	3.3
Climate risks (% of events mentioned)	Drought—40% Unusual change of temperature—20% Disease and pests—17% Flooding, flash flood, landslide—14% Storm—9%
Ratio of HH with current (2015) migrants	37% have current migrants, thereof 29% only domestic, 2% only international, 6% both domestic and international
Ratio of HH with overall migration history	74% had migrants at one point in time, of which 53% only domestic, 6% only international, 15% both domestic and international
Domestic migration destinations	Bangkok & vicinity—51% Eastern Seaboard & Coast—25% Intraprovincial—13% Neighbor province—6% Other—5%
Average amount of domestic remittances (annual) received by HH	32,974 THB (~1,200 USD)
Average amount of international remittances (annual) received by HH	173,070 THB (~6,050 USD)
Remittance spending, domestic (top 5 mentions)	1. Household expenditures 2. Education fees 3. Agricultural investments and running costs 4. Repay debts 5. House renovation
Remittance spending, international (top 5 mentions)	1. Household expenditures 2. Repay debts 3. Education fees 4. Agricultural investments and running costs 5. House renovation
Migrants, gender by destination	International: 77% (231) men, 23% (70) women Domestic: 54% (880) men, 46% (741) women

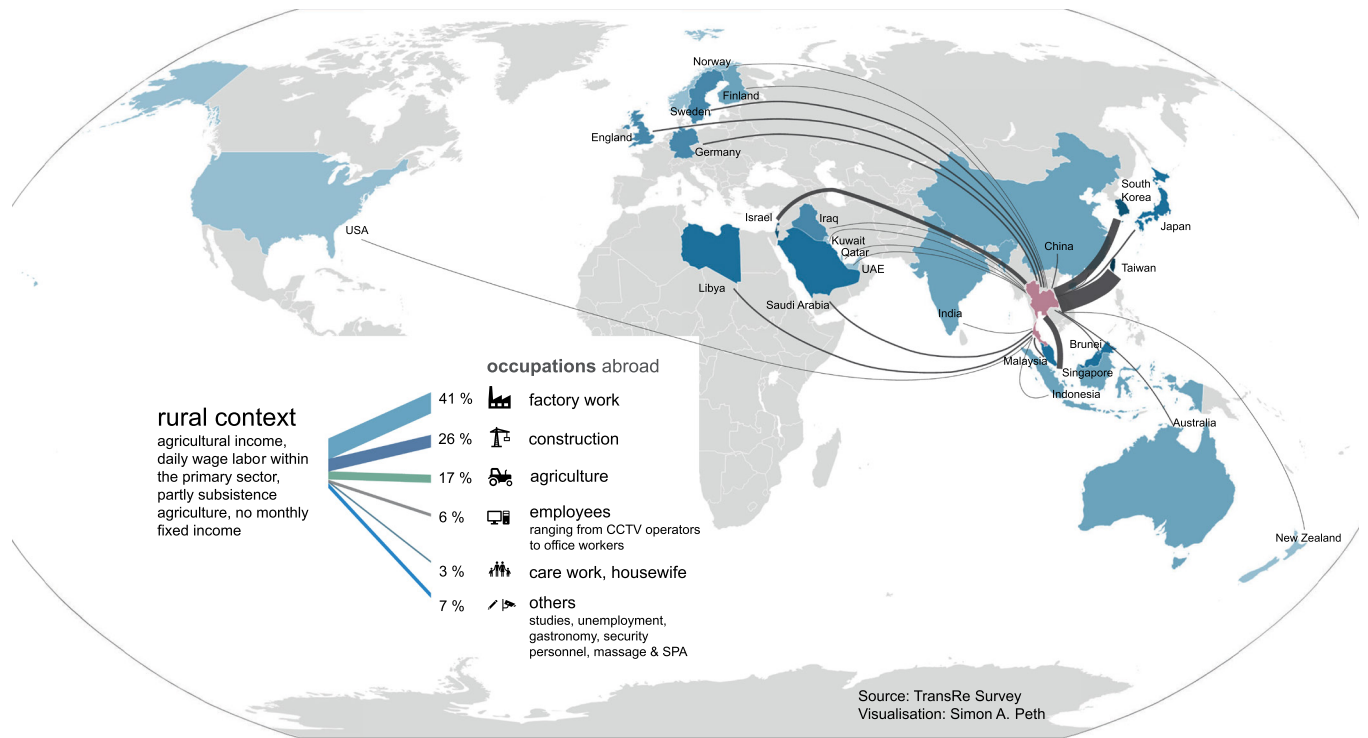
could strategically save or invest remittances, this was an important determinant of overall resilience outcomes. Intersectional aspects played an important role in shaping migration and translocal trajectories: especially under conditions of choice, it was not uncommon for young men to embark on migration as a kind of exploratory endeavor and to experience “the bright city lights,” often after finishing secondary education in origin areas. Although such “young rovers” would remain connected with their households of origin, they would rather not send remittances and would also not be expected to do so. Most young migrant women however would support their households of origin, as was expected of them as part of their social role as caretakers of (aging) parents (22).

In our research, international migration was, in general, pursued out of necessity, and as a livelihood strategy by households who could afford the initial costs (average cost of 100,000 THB, equaling 3,000 USD for international migration), which were mostly covered through loans. Loan-financed international migration adds another layer of risk to the migration project, as these facilitated migration processes are susceptible to fraud and malpractice, resulting in potential failed migration and indebtedness (57, 58). Household wealth and gender intersect in this example in distinct ways, differing from domestic migration: While men mostly migrated directly from places of origin to international destinations, for women, there was a distinct migration pathway linking domestic and international migration. Some women would first migrate domestically, engage in service work in tourist destinations, and enter into relationships for example with a

foreigner, and then move overseas as marriage migrants, enabling them to access international migration without the economic preconditions needed by other international migrants (21). These different patterns are also reflected in the different ways international migrants contribute to livelihoods at their places of origin: In our sample, men tended to send most of their salaries back to Thailand (with 53% sending at least the equivalent of a monthly average rural household income of about 290 USD). Women sent fewer remittances on average (with 38% sending at least the equivalent of a monthly average rural household income); but, in times of crisis at the place of origin, they were able to send substantially more remittances to support their relatives than men, as male labor migrants usually had fewer opportunities to raise extra funds than marriage migrants.

The multiple embeddings of migrants at their places of destination—working and housing conditions, social embedding and participation, and quotidian mobilities, among others—play important roles for their ability and willingness to sustain themselves and lead decent lives, acquire new skills and worldviews, cope with and adapt to adverse conditions and risks, and keep connected with places of origin and send financial and social remittances.

Singapore’s tightly regulated migration regime segregates labor migrants in terms of labor, with sector- and gender-specific permits for migrants from certain countries, mobility, and living conditions, with living arrangements in dormitories and no possibility for family reunion (49, 59). While migrants are mostly



**Fig. 2.** International migration destinations from the four study sites.

employed in the formal sector with entitlements, benefits, and access to services (49), they are exposed to multiple forms of precarity (60) and live at the edge of the Singaporean host society in a state of “permanent temporariness” (61) without the prospect of settling down. This results in a strong and continued sense of belonging both to their places of origin, and within the translocal group of Thai labor migrants. Thus, life as a migrant worker—although spent abroad—is focused on the village and family back home (59). This specific embedding and the orientation towards home results in a continuous flow of financial remittances, which are used to cover the basic needs of the household but also invested in land, broadening the asset base and diversifying the livelihoods of the household (62).

In contrast to migration to Singapore, Thai migration to Germany is to a large extent linked to love and marriage migration, and is dominated by female migrants (51). Through marriage, migrants become more socially embedded in German society, yet different norms, institutions, and social practices are barriers to integration, and marriage migrants also face precarity, social isolation, and stigmatization (63). The financial status of migrants is often linked to that of their partners, and in many cases, migrants are highly dependent on them. This is also reflected in conflicts between husband and wife over the amount and the regularity of sending remittances, as migrants still face high expectations to fulfil their role as supporters of family members in Thailand (21). Through the establishment of families, often with children, marriage migrants have a much stronger orientation toward places of destination and the goal of building livelihoods in Germany. In part due to having less control over financial resources, (female) marriage migrants send remittances back “home” less regularly. Additionally, there is less inclination by migrants toward long-term investments in diversifying and transforming livelihoods at their places of origin. However, marriage migrants are able to mobilize greater resources in times of acute crisis (62).

Domestic labor migrants face fewer barriers in terms of migration cost and labor market access, and therefore this is a more widespread form of migration in the study areas. Migrants are mostly employed in the industrial and service sectors and, to a lesser extent, in the construction sector, or engaged in self-employment. The chances of domestic migrants attaining stable employee status in these sectors are higher for migrants from better-off households, as these households tend to provide their children with better access to higher education (54). Furthermore, these households do not necessarily rely on remittances from migrants for their livelihoods, enabling migrants to invest in improving their life opportunities and careers at places of destination. Domestic migrants from poor and disadvantaged households with lower educational status and fewer resources tend to face more precarious working and living conditions in the place of destination. At the same time, they carry a heavier burden in supporting their remittance-dependent households at places of origin, because these require large, frequent, and ongoing resource transfers. Such migrants have fewer options to accumulate savings or invest in opportunities and careers at places of destination (22). These socioeconomic conditions compound the intersectional and gender dimensions of translocal livelihood formations: When households are poorer and more dependent on steady remittance flows, the expectations that migrants fulfil gender, age, and filial roles are more stringent and leave less leeway and room for maneuver (22).

In order to fully grasp migrants’ multiple embeddedness and the relevance of migration for the resilience in places of origin, multisited research on internal and international migration was contextualized through in-depth analysis of households’ translocal support and innovation networks: While livelihoods remain mostly locally rooted, translocal networks are of pronounced relevance for sustaining rural livelihoods (64) and for driving agricultural innovation (58). At the same time, findings suggest that

translocal networks are not equally available and beneficial for rural households. Households' endowment with and abilities to rely on migration-related and institutional translocal networks are not equally distributed, resulting in different capacities and, consequently, also different resilience outcomes. Poor households can draw on fewer and less diversified translocal networks and social ties, but are highly dependent on them. For these households, financial support from migrating household members and relatives is required to cope with adverse livelihood conditions. While poor households can thus make limited use of migration-related networks to bolster their resilience, they are—at the same time—more affected by the dissolving of the village moral economy, entailing the decline of reciprocal arrangements and traditional safety nets (48). In contrast, better-off households can draw on more abundant translocal networks beyond migration, in particular to institutions such as banks and extension services, providing credit and advice required for the transformation of agricultural livelihoods toward large-scale cash-crop farming (57). Overall, the network analysis suggests that migration-related translocal networks—particularly in the case of domestic migration—nourish coping and to a certain extent adaptive capacity, but rarely provide transformative capacity for escaping the status quo of marginalized small-scale farming (65).

**The Sociospatial Differentiation of Migration-as-Adaptation Outcomes.** The translocal social resilience perspective draws attention to the sociospatial differentiation of the impacts of migration and the resulting translocal connectedness on the capacities and resources of translocal households to deal with stress and perturbation, and to take opportunities to maintain or increase livelihood security. This means that relevant sociospatial scales—including both households and individual members at the places of origin as well as migrants at the places of destination—need to be systematically considered. Fig. 2 displays a generalized typology of five broad categories of resilience outcomes that were found through our multisited research on translocal livelihood constellations of internal and international migrants and their households (Fig. 3).

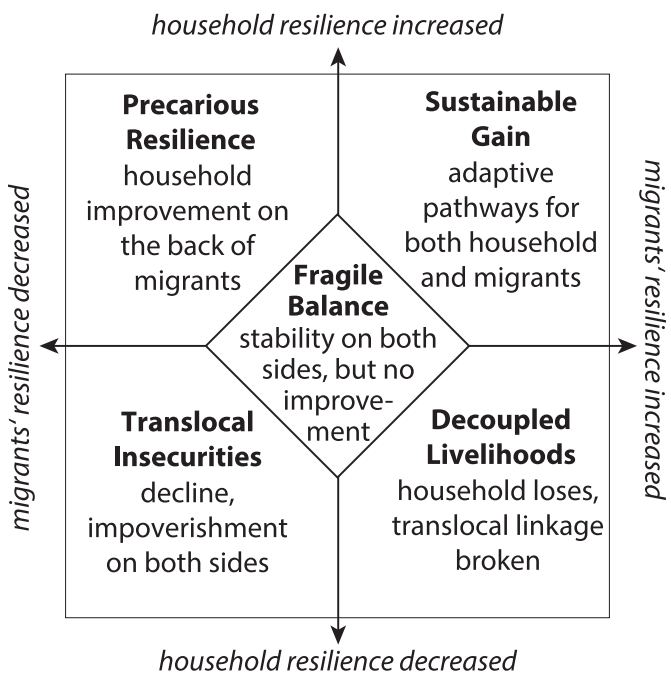


Fig. 3. Translocal resilience outcome matrix.

**Sustainable gain.** The overall well-being of households and family members at the places of origin and of migrants at the places of destination is increased; climate vulnerabilities are reduced, and/or opportunities are realized for adaptive action. This resilience outcome is characterized by migrants with stable and sufficient incomes who are embedded and positioned in the social contexts at both destinations and origins in a supportive way. Households at origin receive sufficient amounts of financial and social remittances beyond their immediate needs and are able to turn them into adaptive action by investing in land and inputs (e.g., irrigation, pond, well-drilling), or by diversifying agricultural production (new crops, livestock). Often, these households (already) have more diversified translocal networks and are able to combine migration- and nonmigration-related social capital, e.g., by taking advantage of their favorable position within translocal innovation networks (e.g., as broker/middleman). Sustainable gain is linked to socioeconomically better-positioned domestic and international migrants who are able to establish themselves in the place of destination.

**Precarious resilience.** The situation of household and family members at the place of origin is improved, but at the considerable cost of decreased well-being of migrants at their places of destination. This was often the outcome for migrants in informal, exploitative, short-term labor relations or precarious self-employment, both of which are associated with excessive work, health problems, social isolation, and poor housing conditions. Migrants are often forced to accept such hardships and make sacrifices on behalf of their family, for example when remitting a substantial share of income to cover the costs of children's education, elderly care, or repay debts due to crop failures. Households receive remittances to fulfil immediate needs as well as improve their situation by building up savings, investing in education, and making strategic livelihood investments. Precarious resilience is associated with translocal livelihood constellations, with domestic and international migrants facing hardship and precarious working and living conditions, and households being dependent on remittances.

**Fragile balance.** The situation of the migrants at the place of destination is stable, but the support provided to the household of origin is minimal, often only sufficient to cope with daily challenges, and does not lead to improvements with regard to climate change adaptation, general risks, and vulnerability. The benefits of migration in terms of financial remittances and social recognition outweigh the costs, but still come at a price, including decreased labor for agricultural and household work at the place of origin, and social costs of separation. This outcome is induced by the absence of significant investments in improving livelihoods, for example when remittances are used to subsidize rather than to innovate small-scale farming activities, resulting in little or no positive change in the situation. In total, the household at the place of origin does not take advantage of the migrating household member in terms of an improved/more flexible and diversified livelihood system and farming, but the migrating household member does not sacrifice his/her personal well-being.

**Decoupled livelihoods.** The situation of migrants at the place of destination is improved or at least stable, but the situation at the place of origin is deteriorating, where migration's benefits do not outweigh its costs. This was especially the case when translocal linkages broke down, for example when migrants entered new couple relations at places of destination and subsequently reduced or stopped their support for the place of origin. Thus, the operational logic at one place is more or less decoupled from the other place and from the overall translocal formation.

**Translocal insecurities.** The situation of both migrants at the place of destination and households at the place of origin is in a state

of decline after, and due to, migration. In cases when precarious labor conditions and lack of social embedding, often combined with physical or mental health issues at the place of destination, are paired with a high dependency on remittances, for example due to a lack of resources or debt problems at the place of origin, the constellation becomes “locked in,” with migrants neither able to improve their position (e.g., by changing jobs) at destination, nor to return to their places of origin, due to resource scarcity.

## 2. Discussion and Conclusion

Existing studies of migration-as-adaptation frequently fail to adequately differentiate migration effects according to space, social scale, and the positionalities of actors, and hence often come to one-sided or even contradictory assessments of the contribution of migration to adaptation (23). Disentangling the outcomes of migration and how they are generated requires an examination of the different embeddings and positionalities of actors in places of origin and destination, as well as of the operational logics and actions that are conditioned by these differences. Based on a multisited, mixed-methods research design, we highlight the importance of the translocal resilience dimension of migration-as-adaptation. Our results show that migration outcomes were markedly differentiated by place and social scale, and it would be misleading to conflate these dimensions into one-dimensional statements of migration failure or success, because it would effectively render actors and their differences invisible (66). While the majority of translocal livelihood formations benefited from migration, these benefits were in general more pronounced for richer than for poorer households, and particular households even experienced losses through migration. Based on our research in Thailand, with few exceptions, migration tended to reproduce existing inequalities rather than evening them out—the double-sided stratification in translocal social fields tends to reproduce precarity and vulnerability (67).

Our study corroborates the findings of previous studies that migration has the potential to support adaptation to climate-related and other, generalized risks (e.g., 68), but that migration outcomes regarding livelihoods and adaptation are unequal. This applies to households with different resource endowments (e.g., 69), but also to differences within households, and along lines of gender (e.g., 70). It strongly supports the findings of Singh and Basu (23), who state that the evaluation of migration-as-adaptation must go beyond general statements and needs to differentiate according to social scale, among other factors. The importance of socioeconomic embedding in places of destination is in line with findings from a survey carried out by the International Labour Organization that the adherence to labor regulations in places of destination was the most important driver of migration outcomes (71).

This more nuanced view of migration-as-adaptation opens up two important avenues: First, it makes the perspective on and the assessment of the relevance of migration for adaptation more realistic. By systematically differentiating migration outcomes according to place and social scales (and, additionally to social, economic, and ecological dimensions and to temporal scope), unhelpful generalizations that overlook or conflate these differences, and thus tend to be either overly optimistic or pessimistic, are avoided. Second, by looking at the mechanisms that produce these differentiated migration outcomes, the conditions under which migration can contribute to adaptation can be identified, and thus potential entry points for effective policy options can be formulated. The degree to which migration effectively resulted in direct or indirect adaptive outcomes, for example, depends to a considerable extent on the embedding at places of destination, the

combination of financial and social remittances, and the household conditions at the place of origin that enable the effective usage of such additional resources (72). In addition, phenomena such as remittance decay (73) can be better understood by systematically considering the character and dynamics of the translocal social relations and the multiscale and intersectional issues and embeddings at play that shape them. This approach also systematically addresses the question of under what conditions (sectors, technological levels) social remittances (of skills and capacities) can be successfully conveyed to places of origin.

Our study shows that translocal and multiscale perspectives are important complements for already-existing differentiations of migration impacts or adaptation outcomes according to sectoral dimensions, as brought forward for example by Warner and Afifi (46) or Vinke et al. (10). We have particularly focused on the economic and social dimensions due to their significance for vulnerability. But, we also highlight the importance of the ecological dimension and the temporal scope, which facilitate the integration of key aspects of sustainability research with the concept of translocal social resilience. Migration and the resulting translocal livelihood situations have the potential to alleviate pressure from local resource use (e.g., 74), to increase awareness for and the dissemination of sustainable practices, and thus to increase sustainability. We found several examples of such processes and mechanisms, for example a return migrant that introduced and popularized organic agriculture in the context of her village of origin, or the broadcast-sowing of rice that replaced transplanting, in order to reduce labor cost in the increasing likelihood of failing early monsoon rains—a practice that migrants have introduced to the research areas.

On the contrary, the investment of remittances can also lead to unsustainable agricultural practices and land-use change, for example, when farmers increase the use of pesticides and chemical fertilizers, or change to crops such as sugarcane or rubber trees. Within the given structural (economic and political) context, and from the perspectives of farming households and of economic and political actors, the latter changes are seen as improving the economic status in the short and medium term. However, when a long-term and ecological perspective is added, such changes would rather be seen as maladaptive.

The conceptual framework provides the terminology to assess and specify the differential contributions of migration to adaptation and the inequalities that migration generates. Our empirical results show the uneven distribution of the gains and losses of migration, along several dimensions including income, social relations, identity, and health, at different places and scales. We argue that this is not merely a theoretically interesting intricacy, but that it is essentially necessary in order to make visible and address intersectional inequalities and the underlying root causes of vulnerability (16). Recent research and the sixth report of IPCC Working Group II make it increasingly clear that reducing vulnerability is a central, and in poorer parts of the world probably the most central, element of adapting to climate change and pursuing sustainable and climate resilient development pathways (75–77).

## 3. Materials and Methods

We draw on empirical material from a five-year research project on migration-as-adaptation (Trans|Re Project) with a mixed-methods and multisited research design. Trans|Re Project received an ethical approval through IPSR-IRB, Mahidol University, Thailand. Informed consent was obtained from all participants in written or oral form. The study was conducted in four purposefully selected rural subdistricts in North and Northeast Thailand that met the criteria of dependence

on rainfed agriculture, exposure to environmental risks, embeddedness in internal and international migration systems, and remoteness (commuting to urban areas did not play a role for livelihoods). The site selection followed a multistep process including a preselection based on data on environmental risks and the existence of international migration, exploratory site visits to 23 subdistricts including semi-structured interviews with village heads, and a final selection of four subdistricts (Ban Chai, Kann Luang, Nam Kum, and Mae Salong Nai) in four provinces (Udon Thani, Buriram, Phitsanulok, and Chiang Rai) in North and Northeast Thailand. Bangkok Metropolitan Region (BMR) was selected as it is the main destination of internal migrants. Singapore and Germany were selected to represent two highly contrasting types of migration, with highly differentiated patterns with regard to migration regime, gender, legal status, and working and living conditions.

A two-round panel survey was carried out in the four subdistricts with 1,086 randomly selected households. The survey covered the following thematic areas: household structure and asset base, livelihoods, migration, and risk exposure. Additionally, an individual survey with 135 migrating household members in the places of destination in BMR was carried out. An online survey with 246 Thai migrants in Germany was conducted covering the topics of household structure, migration history, working and living conditions, and social and financial remittances. Data were analyzed with descriptive statistics.

The issue of livelihood vulnerability was additionally addressed by 99 semi-structured household interviews, 16 participatory group discussions, and three expert interviews. Multisited qualitative research on international migration was carried out in Thailand, Singapore, and Germany, and involved 110 semi-structured interviews (Thailand: 60, Singapore: 38, Germany: 12; 24 interviews were conducted with household members in places of origin and destinations), nine participatory group discussions (migration mappings, remittance-use diagrams in Thailand and Singapore), 14 sites of participatory observation (Thailand and Singapore), five photograph interviews (Thailand and Singapore), and two social-media discussions (Germany) (21). Multisited qualitative research on internal migration was carried out in the rural study sites and Bangkok Metropolitan Area, with 140 interviews—71 in rural and 69 in urban areas. Forty-two interview partners in urban areas were migrating household members of households that had been interviewed in rural places of origin (56). Minutes and transcripts were analyzed with qualitative content analysis. Two sets of formal social-network

analysis (SNA) were conducted on support networks and innovation networks (65). The ego-centered support networks were constructed through 70 household interviews involving information on a total number of 762 alters and 891 ties (64). Additionally 60 interviews with farmers were conducted for the innovation network (64). Governance context was addressed through 75 stakeholder and expert interviews at the local, regional, national, and international levels.

**Data, Materials, and Software Availability.** The following anonymized data have been deposited on [figshare.com](https://figshare.com): Dataset I (78) consists of three tables, one on household level and two on individual levels for domestic and international migrants. Data were collected from 1,085 households in four provinces in Thailand (Udon Thani, Buriram, Phitsanulok, and Chiang Rai), covering 1,625 domestic and 301 international migrants. The survey is representative on the level of the four subdistricts in which the households were randomly sampled (one subdistrict in each province). Dataset II (79) lists all field interactions that produced data for the research project “TransRe. Building resilience through trans-locality. Climate change, migration and social resilience of rural communities in Thailand”: the quantitative survey, interviews, focus group discussions, support network mapping interviews, and innovation network interviews.

**ACKNOWLEDGMENTS.** This research was supported by the German Federal Ministry of Education and Research and has been conducted within the project “Building Resilience through Translocality: Climate Change, Migration and Social Resilience of Rural Communities in Thailand” under grant number 01LN1309A. We would like to thank RaksThai Foundation and the Institute for Social and Population Research, Mahidol University, for their support throughout the research project.

Author affiliations: <sup>1</sup>Department of Geography and Regional Research, University of Vienna, 1010 Vienna, Austria; <sup>2</sup>Wittgenstein Centre for Demography and Global Human Capital International Institute for Applied Systems Analysis, Oesterreichische Akademie der Wissenschaften (Austrian Academy of Sciences), University of Vienna, 1010 Vienna, Austria; <sup>3</sup>Raks Thai Foundation, 10400 Bangkok, Thailand; <sup>4</sup>Climate, Environment, and Conflict Program, United States Institute of Peace, Washington, DC 20037; <sup>5</sup>Leibniz Centre for Agricultural Landscape Research, Research Area 2 “Land use and governance”, 15374 Müncheberg, Germany; and <sup>6</sup>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 53113 Bonn, Germany

- W. C. Clark, A. G. Harley, Sustainability science: Toward a synthesis. *Annu. Rev. Environ. Res.* **45**, 331–386 (2020).
- R. Black, S. G. Bennett, S. M. Thomas, J. R. Beddington, Climate change: Migration as adaptation. *Nature* **478**, 447–449 (2011).
- F. Gemenne, J. Blocher, How can migration serve adaptation to climate change? Challenges to fleshing out a policy ideal. *Geogr. J.* **183**, 336–347 (2017).
- K. Ober, P. Sakdapolrak, How do social practices shape policy? Analysing the field of ‘migration as adaptation’ with Bourdieu’s ‘Theory of Practice’. *Geogr. J.* **183**, 359–369 (2017).
- K. Vinke, J. Bergmann, J. Blocher, H. Upadhyay, R. Hoffmann, Migration as adaptation? *Migr. Stud.* **8**, 626–634 (2020).
- R. McLeman, B. Smit, Migration as an adaptation to climate change. *Clim. Change* **76**, 31–53 (2006).
- T. Affi *et al.*, Human mobility in response to rainfall variability: Opportunities for migration as a successful adaptation strategy in eight case studies. *Migration Dev.* **5**, 254–274 (2016).
- P. Sakdapolrak, S. Naruchaikusol, K. Ober, V. Tolo, Migration in a changing climate. Towards a translocal social resilience approach. *DIE ERDE* **147**, 81–94 (2016).
- A. Maharjan *et al.*, Migration and household adaptation in climate-sensitive hotspots in South Asia. *Curr. Clim. Change Rep.* **6**, 1–16 (2020).
- K. Vinke *et al.*, Is migration an effective adaptation to climate-related agricultural distress in sub-Saharan Africa?. *Population Environ.* **43**, 319–345 (2021).
- M. Burnham, Z. Ma, Linking smallholder farmer climate change adaptation decisions to development. *Climate Dev.* **8**, 289–311 (2016).
- C. Wiederkehr, M. Beckmann, K. Hermans, Environmental change, adaptation strategies and the relevance of migration in Sub-Saharan drylands. *Environ. Res. Lett.* **13**, 113003 (2018).
- F. Ponsot, D. F. Terry, B. Vásquez, P. de Vasconcelos, *Sending Money Home: Contributing to the SDGs, one family at a time* (International Fund for Agricultural Development, 2017).
- R. McLeman *et al.*, Conceptual framing to link climate risk assessments and climate-migration scholarship. *Clim. Change* **165**, 24 (2021).
- J. Rigg, A. Salamanca, Connecting lives, living, and location. *Crit. Asian Stud.* **43**, 551–575 (2011).
- G. Cundill *et al.*, Toward a climate mobilities research agenda: Intersectionality, immobility, and policy responses. *Global Environ. Change* **69**, 102315 (2021).
- A. M. Findlay, Migrant destinations in an era of environmental change. *Global Environ. Change* **21**, 550–558 (2011).
- A. Gänsbauer, S. Bilegsaikhan, A. Trupp, P. Sakdapolrak, *Migrants at Risk—Responses of Rural-Urban Migrants to the Floods of 2011 in Thailand* (TransRe Working Paper No. 2, Department of Geography, University of Bonn, 2017).
- G. Spilker, Q. Nguyen, V. Koubi, T. Böhmelt, Attitudes of urban residents towards environmental migration in Kenya and Vietnam. *Nat. Climate Change* **10**, 622–627 (2020).
- W. N. Adger *et al.*, Human security of urban migrant populations affected by length of residence and environmental hazards. *J. Peace Res.* **58**, 50–66 (2021).
- S. A. Peth, P. Sakdapolrak, Resilient family meshwork. Thai-German migrations, translocal ties, and their impact on social resilience. *Geoforum* **114**, 19–29 (2020).
- L. Porst, P. Sakdapolrak, Gendered translocal connectedness: Rural–urban migration, remittances, and social resilience in Thailand. *Popul. Space Place* **26**, e2314 (2020).
- C. Singh, R. Basu, Moving in and out of vulnerability: Interrogating migration as an adaptation strategy along a rural–urban continuum in India. *Geogr. J.* **186**, 87–102 (2020).
- W. N. Adger, H. Eakin, A. Winkels, Nested and teleconnected vulnerabilities to environmental change. *Front. Ecol. Environ.* **7**, 150–157 (2009).
- B. Obrist, C. Pfeiffer, R. Henley, Multi-layered social resilience. *Prog. Dev. Stud.* **10**, 283–293 (2010).
- M. Keck, P. Sakdapolrak, What is social resilience? Lessons learned and ways forward. *Erdkunde* **67**, 5–19 (2013).
- A. M. A. Saja, M. Teo, A. Goonetilleke, A. M. Ziyath, A critical review of social resilience properties and pathways in disaster management. *Int. J. Disaster Risk Sci.* **12**, 790–804 (2021).
- P. Bourdieu, *Practical Reason: On the Theory of Action* (Stanford University Press, 1998).
- L. de Haan, A. Zoomers, Exploring the frontier of livelihoods research. *Dev. Change* **36**, 27–47 (2005).
- P. Sakdapolrak, Livelihoods as social practices—Re-energising livelihoods research with Bourdieu’s theory of practice. *Geogr. Helv.* **69**, 19–28 (2014).
- P. Sakdapolrak, *Building Resilience Through Translocality: Climate Change, Migration and Social Resilience of Rural Communities in Thailand* (TransRe Working Paper No. 1, Department of Geography, University of Bonn, 2014).
- C. Greiner, Can households be multilocal? Conceptual and methodological considerations based on a Namibian Case Study. *DIE ERDE* **143**, 195–212 (2012).
- A. Andersson Djurfeldt, Translocal livelihoods research and the household in the Global South—A gendered perspective. *J. Rural Stud.* **86**, 16–23 (2021).
- C. Greiner, P. Sakdapolrak, Rural–urban migration, agrarian change, and the environment in Kenya: A critical review of the literature. *Population Environ.* **34**, 524–553 (2013).
- C. Greiner, P. Sakdapolrak, Translocality: Concepts, applications and emerging research perspectives. *Geogr. Compass* **7**, 373–384 (2013).
- M. Steinbrink, H. Niedenführ, *Africa on the Move: Migration, Translocal Livelihoods and Rural Development in Sub-Saharan Africa* (Springer International Publishing, 2020).
- K. Brickell, A. Datta, *Translocal Geographies: Spaces, Places, Connections* (Routledge, 2011).



38. B. Etzold, B. Mallick, "Moving beyond the focus on environmental migration towards recognizing the normality of translocal lives: Insights from Bangladesh" in *Migration, Risk Management and Climate Change: Evidence and Policy Responses*, A. Milan, B. Schraven, K. Warner, N. Cascone, Eds. (Springer International Publishing, 2016), pp. 105–128.
39. P. Levitt, N. Glick Schiller, Conceptualizing simultaneity: A transnational social field perspective on society. *Int. Migr. Rev.* **38**, 1002–1039 (2004).
40. T. Rockenbach, P. Sakdapolrak, Social networks and the resilience of rural communities in the Global South: A critical review and conceptual reflections. *Ecol. Soc.* **22**, 10 (2017).
41. C. Greiner, S. Peth, P. Sakdapolrak, *Deciphering Migration in the Age of Climate Change: Towards an Understanding of Translocal Relations in Social-Ecological Systems* (TransRe Working Paper No. 2, Department of Geography, University of Bonn, 2015).
42. L. Porst, P. Sakdapolrak, How scale matters in translocality: Uses and potentials of scale in translocal research. *Erdkunde* **71**, 111–126 (2017).
43. P. Lama, M. Hamza, M. Wester, Gendered dimensions of migration in relation to climate change. *Climate Dev.* **13**, 326–336 (2021).
44. L. van Praag, Gender, environmental change, and migration aspirations and abilities in Tangier and Tinghir, Morocco. *Hum. Ecol.* **50**, 23–34 (2022).
45. B. Purvis, Y. Mao, D. Robinson, Three pillars of sustainability: In search of conceptual origins. *Sustain. Sci.* **14**, 681–695 (2019).
46. K. Warner, T. Afifi, Where the rain falls: Evidence from 8 countries on how vulnerable households use migration to manage the risk of rainfall variability and food insecurity. *Climate Dev.* **6**, 1–17 (2014).
47. D. Eckstein, V. Künzel, L. Schäfer, *Global Climate Risk Index 2021: Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2019 and 2000–2019* (Germanwatch, 2021).
48. J. Rigg, *More than Rural: Textures of Thailand's Agrarian Transformation* (University of Hawaii Press, 2019).
49. T. Bork-Hüffer, S. A. Peth, Arrival or transient spaces? differentiated politics of mobilities, socio-technological orderings and migrants' socio-spatial embeddedness. *Urban Plan.* **5**, 33–43 (2020).
50. Statistisches Bundesamt, *Statistisches Jahrbuch: Deutschland und Internationales 2019* (Statistisches Bundesamt, 2019).
51. P. Statham, S. Scuzzarello, S. Sunanta, A. Trupp, Globalising Thailand through gendered 'both-ways' migration pathways with 'the West': Cross-border connections between people, states, and places. *J. Ethn. Migr. Stud.* **46**, 1513–1542 (2020).
52. J. Carling, K. Schewel, Revisiting aspiration and ability in international migration. *J. Ethn. Migr. Stud.* **44**, 945–963 (2018).
53. H. de Haas, A theory of migration: The aspirations-capabilities framework. *Comp. Migr. Stud.* **9**, 8 (2021).
54. L. Porst, P. Sakdapolrak, Advancing adaptation or producing precarity? The role of rural-urban migration and translocal embeddedness in navigating household resilience in Thailand. *Geoforum* **97**, 35–45 (2018).
55. A. Limsakul *et al.*, Updated basis knowledge of climate change summarized from the first part of Thailand's second assessment report on climate change. *Appl. Environ. Res.* **41**, 1–12 (2019).
56. L. Porst, *Translocal Resilience in a Changing Environment: Rural-Urban Migration, Livelihood Risks, and Adaptation in Thailand* (University of Bonn, 2021).
57. C. Vanaspong, *A Case Study of Thai migrant workers exploited in Sweden* (2012).
58. UNODC, *The Role of Recruitment Fees and Abusive and Fraudulent Recruitment Practices of Recruitment Agencies in Trafficking in Persons* (United Nations Office on Drug and Crime, 2015).
59. S. A. Peth, H. Sterly, P. Sakdapolrak, Between the village and the global city: The production and decay of translocal spaces of Thai migrant workers in Singapore. *Mobilities* **13**, 455–472 (2018).
60. C. Chin, Precarious work and its complicit network: Migrant labour in Singapore. *J. Contemporary Asia* **49**, 528–551 (2019).
61. O. Yiftachel, Theoretical notes on 'gray cities': The coming of urban apartheid? *Plan. Theory* **8**, 88–100 (2009).
62. S. A. Peth, *Migration and Translocal Resilience: A multi-sited analysis in/between Thailand, Singapore and Germany* (2020).
63. N. Piper, S. Lee, Marriage migration, migrant precarity, and social reproduction in Asia: An overview. *Crit. Asian Stud.* **48**, 473–493 (2016).
64. T. Rockenbach, P. Sakdapolrak, H. Sterly, Do translocal networks matter for agricultural innovation? A case study on advice sharing in small-scale farming communities in Northeast Thailand. *Agric. Human Values* **36**, 685–702 (2019).
65. T. Rockenbach, *Networks, Translocality, and the Resilience of Rural Livelihoods in Northeast Thailand: Networks, Translocality, and the Resilience of Insights from a Social Network Perspective* (University of Bonn, 2022).
66. M. Borderon *et al.*, The risks of invisibilization of populations and places in environment-migration research. *Humanit. Soc. Sci. Commun.* **8**, 1–11 (2021).
67. L. Parsons, Mobile inequality: Remittances and social network centrality in Cambodian migrant livelihoods. *Migr. Stud.* **4**, 154–181 (2016).
68. W. N. Adger *et al.*, Focus on environmental risks and migration: Causes and consequences. *Environ. Res. Lett.* **10**, 60201 (2015).
69. H. de Haas, International migration, remittances and development: Myths and facts. *Third World Q.* **26**, 1269–1284 (2005).
70. R. Bhagat, Migration, gender and right to the city: The Indian context. *Econ. Polit. Wkly.* **52**, 35–40 (2017).
71. B. Harkins, D. Lindgren, T. Suravoranon, *Risks and Rewards: Outcomes of Labour Migration in South-East Asia* (ILO Regional Office for Asia and the Pacific; IOM Regional Office for Asia and the Pacific, 2017).
72. S. A. Peth, P. Sakdapolrak, When the origin becomes the destination: Lost remittances and social resilience of return labour migrants in Thailand. *Area* **52**, 547–557 (2019).
73. T. Arun, H. Ulku, Determinants of remittances: The case of the South Asian community in Manchester. *J. Dev. Stud.* **47**, 894–912 (2011).
74. J. A. Oldekop, K. R. Sims, M. J. Whittingham, A. Agrawal, An upside to globalization: International outmigration drives reforestation in Nepal. *Global Environ. Change* **52**, 66–74 (2018).
75. C. H. Trisos *et al.*, "Africa supplementary material" in *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, H. O. Pörtner, Eds. (Cambridge University Press, Cambridge, UK, 2022).
76. N. P. Simpson *et al.*, A framework for complex climate change risk assessment. *One Earth* **4**, 489–501 (2021).
77. S. Eriksen *et al.*, Adaptation interventions and their effect on vulnerability in developing countries: Help, hindrance or irrelevance? *World Development* **141**, 105383 (2021).
78. H. Sterly, P. Sakdapolrak, TransRe Survey 1, TransReSurvey1\_Data.xls. Figshare. <https://doi.org/10.6084/m9.figshare.21644426.v1>. Deposited 29 November 2022.
79. H. Sterly, P. Sakdapolrak, Fieldlog\_Sampling\_Frame\_quantitative\_qualitative, FieldLog\_Sampling\_Frame\_quantitative\_qualitative.xlsx. Figshare. <https://doi.org/10.6084/m9.figshare.21648521.v1>. Deposited 30 November 2022.