Identity digitalization as dispossession and entrenched displacement: digitalization at the nexus of migration "management" and climate change in Thailand and Türkiye

Amanda Flaim[1,2] and Stephanie J. Nawyn[1]*

[1]Department of Sociology, Michigan State University, East Lansing, MI, United States, [2]James Madison College, Michigan State University, East Lansing, MI, United States

Digitalizing technologies are increasingly heralded by a range of powerful actors and some human rights organizations as appropriate and necessary tools for 'managing migration' and mitigating climate change. Yet, just as exclusionary and marginalizing discourses of "migration problems" serve to justify the digital surveillance of vulnerable and precariously statused people, the context of climate change, accelerating contestation over land and water, and discourses of catastrophe prove fertile ground for entrenching these practices and technologies in multiple ways. Researchers are identifying the dispossessive power of digitalization in the arena of personal identification and in relation to resource and land mapping, yet these dynamics are rarely interrogated in connection. In this comparative analysis, we draw from sustained ethnographic engagement and insights in critical digitalization studies and political economy to analyze the consequences of state efforts to digitalize identity and resources in Thailand and Türkiye in the age of the Anthropocene. Our research points to a need for greater attention to the ways that state efforts to digitalize identification and registration of immigrant, refugee, and stateless people link with, and can facilitate, more efficient dispossessions and displacements of precariously statused communities from vital and contested lands.

KEYWORDS

migration, refugee, stateless, climate change, surveillance

Introduction

New technologies, from AI, biometric identification, blockchain, and smartphone apps, are being heralded by states and human rights organizations alike as viable solutions to problems associated with migration. For governments concerned with limiting immigration, technology such as the US Customs and Border Control CBP One App promises efficiency and offers the veneer of neutrality in "migration management" practices. For supra-governmental entities such as UNHCR and IOM, digitalization efforts like biometric identity cards and smartphone apps promise a degree of clarity and fairness in registration procedures of migrant, stateless, and refugee communities—people who, by virtue of their exclusion, are disproportionately vulnerable to being dispossessed of identification papers. Biometric IDs, in particular, promise to reduce corruption and extortion by entrepreneurial

GRAPHICAL ABSTRACT
(A) Screenshot of IOM's free "MigApp" Smartphone application to assist migrants on their journeys, available in English, Arabic, French, Spanish, Chinese, Italian, Russian, and Portuguese (accessed 15 May 2023). **(B)** Screenshot of Thailand's "National Digital ID" (NDID) website platform (English version), featuring biometric data and claims to ensure "Digital Identity for All" (accessed 12 May 2023). **(C)** Screenshot of Türkiye's "Goc Idaresi" created by the Directorate General of Migration Management to provide foreigners with information on their rights and responsibilities in the country (accessed 21 May 2023).

agents who would seek to exploit gaps and inefficiencies in the bureaucratic relief and assistance system. Similarly, the IOM's "MigApp" pictured above aims to assist migrants in their long journeys. Similarly, innovative human rights organizations such as Issara and Project Rohingya use multi-lingual apps and blockchain to subvert the bordered limitations and exclusions that are built into the Westphalian world order. With tensions arising from the potential utility of digitalization for achieving each of these competing ends—whether advancing state surveillance of already-marginalized people in the name of "ordering" and "regularizing" migration[1] or pursuing mobility and identity justice for migrants—digitalization efforts warrant critical scrutiny.

Researchers across multiple fields of inquiry are raising concerns about the risks and harms of digitalization to migrants and precariously statused people in different contexts around the world (Madianou, 2019a,b; Glouftsios and Scheel, 2021; Low, 2021; Schoemaker et al., 2021; Weitzberg et al., 2021; Prasse-Freeman, 2022). Most of this research examines how digitalization, as a contemporary component of state-making and securitization, facilitates the subordination, exclusion, surveillance, and displacement of communities who are minoritized along racial, gendered, sexual, and religious lines. Little research, however, has explicitly examined digitalization and migration management in the context of climate change, which is both a significant and growing driver of migration (Black et al., 2011; Pei et al., 2019), and a crisis that is also increasingly constructed as urgently requiring digitalized solutions (for reviews, see Creutzig et al., 2022; Dwivedi et al., 2022). Studies of climate change and migration that do consider digitalization dynamics tend to do so only with regard to how migration may be best "managed" and fail to critically examine how technologies mediate and *shape* social and political life, how they are weaponized to achieve illiberal governance ends, or how they pose considerable risks for communities already at risk of dispossessions and displacement (for examples see Bettini et al., 2020; Jakob, 2022).

While digital technologies are debated as potential solutions to challenges related to both migration and climate change, we explore how those technologies are currently being used in contexts of growing rigidity of state borders, internal policies that deny people the rights to move, and heightened ecological contestation. What are the implications of digitalization for precariously statused communities in the context of growing climate volatility and accelerating resource contestation? If state responses to climate change-related migration, displacement, and resource degradation are to restrict mobility rather than accept it as a necessary adaptation strategy, is there a future for digital technologies in migration management that supports human rights, wellbeing, and vitality, or will these technologies merely entrench state power?

In this article, we undertake a comparative analysis of the impacts of digitalization on refugee, stateless, and immigrant communities in Thailand and Türkiye, both sites of vast undocumented immigration, protracted statelessness, political volatility, and climate vulnerability. Drawing from years of sustained ethnographic analysis of state surveillance practices and the experiences of migrant, refugee, and stateless communities in both sites, we examine the ways that digitalization campaigns have changed in both contexts and the particular impacts of these programs on precariously statused people. Offering novel analysis of the ways in which climate change and environmental digitalization programs are reformulating relationships between people, land, and water in these contexts, we consider whether and how digitalization campaigns may be generating vulnerabilities, exacerbating extant structural inequities, and/or potentially mediating or remediating them. On the basis of this analysis, we amplify political calls for transparency and oversight with regard to state digitalization programs. Additionally, we call for more research into the ways digitalization is impacting precariously statused people, particularly with regard to their tenuous and imperiled relationships with the land, water, and vital ecologies in Anthropocene.

In defining key terms, we draw heavily upon Witteborn (2022). Digitalization refers to the way that social life is organized by and around digital technologies. It is based on the linked phenomena of 1) datafication, which is the act of translating human experiences into data, and 2) digitization, which comprises the encoding of people, their actions, their identities, and other complex information into numerical binaries (zeros and ones). Whereas digitization creates an abstraction of lived experience, reducing people to more efficient and less complex representations, digitalization calls attention to the social life of digital technologies. There are a number of ways in which digitalization shapes the lives of refugees, migrants, and stateless people, such as

---

1   The 2018 Global Compact emphasizes state commitments to promoting "safe, orderly and regular" migration and calls for interventions that support migrants while minimizing "burdens" on states and societies that receive, with varying degrees of welcome, immigrant communities [for one of many recent examples, see O'Toole (2021)].

using digital technologies to facilitate access to free education through remote learning or to send remittances, but our concerns focus on those processes that involve datafication, which are commonly utilized in migration and population management schemes, particularly with respect to the identification and registration of individuals, and decisions about who receives what rights on the basis thereof.

Everyday artifacts of digitalization in contemporary forms of cell phones and smart credit cards, etc., may appear politically neutral with regard to their highly individuated accessibility and the international connectivities that they enable. However, the logics upon which these technologies are founded are located within a much longer and contested history of state-making, population registries, land enclosures, capital expansion, and border-making (Breckenridge and Szreter, 2012). Digitalization, datafication, and their cadastral survey and land-mapping analogs are tied to ontological assumptions about who people are on the basis of where and when we are born, as well as how we live, work, relate to land/property, and even how they die (Anderson, 1983; Scott, 1998; Mitchell, 2002). These assumptions are neither universal nor simply descriptive, however. Normatively linked to Western logics of modernity that elevate the rights of individuals and property in relation to bordered nation-states, digitalization encodes and reifies contested relationships between individuals, social institutions, and the state in terms of taxes, social security, conscription, employment and labor, marriage, and family rights (Caplan, 2001; Caplan and Torpey, 2001; Szreter, 2007; Breckenridge and Szreter, 2012). Belying their widely accessible and ostensibly neutral forms, contemporary digitalization efforts often carry forth, and may actually *enhance,* the inequitably raced and gendered inheritances of their earliest antecedent forms (for example, see Skinner, 2020).

Certainly, various digitization efforts that endeavor to support migrants along precarious journeys—to evade traffickers and seek safe employment, subvert draconian borderscapes, remit money, or secure necessary documentation—may indeed produce humane outcomes for families forced to navigate impossible and inhumane circumstances, but questions remain regarding how such efforts might be sustained in volatile political contexts, and/or how they may be sustained within insecure funding environments. Even in contexts of relatively secure privacy protections, concerns persist regarding potential security breaches and state failure in systems management, and legal responsibilities to maintain and protect private information. Moreover, risks of data breaches and state hacks of private information potentially exacerbate the vulnerabilities experienced by migrant, stateless, refugee, and other precariously statused communities.

Similar to all forms of technology, digital technologies integrated into the lives of migrants are not neutral but rather embedded with biases through their creation and their users. Automated decision-making models (ADM), for instance, can perpetuate the existing inequalities in migration regimes because they draw from data on past decisions and opaque definitions of "risk" (Bither and Ziebarth, 2021). The use of refugee data by states and humanitarian NGOs is rarely transparent; multiple studies have shown that refugees are not aware of the ways that information about their identities is collected and used (see, for example, Kaurin, 2019; Schoemaker et al., 2021a,b). Even when states are not collecting data from migrants directly, technology companies collect data when migrants use technologies for their own purposes. For example, Syrians rescued in the Mediterranean Sea often initiate their own rescue through their smartphones (Gillespie et al., 2018), but using their smartphones produces geolocation data, which, if accessed by state agents, could be used to deny them entry, asylum, or access to other rights.

The tensions arising from the potential use of a unique geolocation datapoint collected at a moment of crisis in international waters for one's liberation and rescue or arrest and deportation arise from what Feldman et al. (2011) refer to as accumulating insecurity. Post 9/11, efforts by state and capital interests to secure borders and surveil personal data have accelerated, not only in the United States but also worldwide, resulting in a vast digital borderscape comprising "technological assemblages and media imaginaries" (Chouliaraki and Georgiou, 2022, see also Madianou, 2019a,b; Leese et al., 2022). States deploy violently ethnocentric crisis discourses to justify deeply illiberal population "management" schemes, which do not (and cannot) accurately identify all individuals as "immigrant" or "citizen." Their power arguably lies in the optimistic veneer of scientific objectivity and data neutrality, thereby allowing states to actively construct and crystallize these categories. India's weaponization of the Aadhaar biometric card scheme to construct Muslim citizens as "illegal immigrants" (Panigrahi, 2022), Bangladesh's weaponization of UNHCR-issued biometric IDs to repress Rohingya refugees (Oh, 2017), and China's tracking of cellphone data to mark Uyghur citizens as "potential terrorists" (Tynen, 2022) are only three recent, cautionary examples.

If exclusionary and marginalizing discourses of migration serve to justify the use of digital technologies for the surveillance and immobilization of already vulnerable and precariously statused communities, then climate change, accelerating contestation over land and water, and discourses of catastrophe prove fertile ground for entrenching these practices and technologies in multiple ways. First, in very real terms, climate volatility is a growing driver of migration and associated inequalities. Projections indicate that climate change is producing conditions in which people are forced to migrate internally or may attempt to migrate internationally, provided they have the ability to do so (Burzyński et al., 2022), and yet, research around the world on climate events consistently shows that the ability of a family or community to move in response to ecological rupture is mediated by extant inequities, as well as policies that are increasingly being implemented to limit the ability of people to claim protections and rights (Elder et al., 2007; FitzGerald, 2019; Ayeb-Karlsson, 2020; Cundill et al., 2021; Hadi et al., 2021; Pragg, 2021).

Second, and quite significantly, climate crisis events and discourses are also driving digitalization and related technical solutions to fight and monitor environmental decline (Creutzig et al., 2022; Dwivedi et al., 2022). Yet, just like digitalization agendas in population and migration "management" schemes, these efforts do not always achieve their publicly stated goals of data-neutral representation and objective modeling of environmental change. Rather, these efforts are shown to actively shape and mediate relationships to land, water, and natural worlds in highly unequal ways (Bluwstein, 2019; Liu and Sengers, 2021; Haenssgen et al., 2022; Stock and Garzedi, 2022). While some hail the promise of blockchain and other forms of digitalization to "disrupt" conventional land markets and to protect communities at high risk of land dispossession, landlessness, and displacement (Daniel and Speranza, 2020), evidence also indicates that resource digitalization efforts, such as remote satellite sensing and GPS demarcations, may be enabling more efficient land grabs and enclosures, thereby facilitating the dispossession of agrarian communities and Indigenous peoples from their lands (for example, see Bluwstein, 2019; Haenssgen et al., 2022; Stock and Garzedi, 2022).

In one analysis of the effects of digitalization of agriculture and land in the United States, Liu and Sengers (2021, p. 1) note that,

> "Legibility [and datafication] in digital agriculture systems occurs at the confluence of two traditions of legibility: the data-driven model common in the design of digital systems, and tactics for the control of nature and labor that have developed in the United States since the foundation of the colonies."

Indeed, state digitalization efforts for population "management," which encompass political domains of labor and migration, are forged in parallel with digitalization efforts to register, map, model, and claim land, water, and other resources that are increasingly contested in the context of accelerating climate change. Taken together, the securitization and privatization of land, coupled with globalized surveillance and border infrastructures, are producing a shifting terrain of insecurity. In our respective field sites, we have observed government officials citing environmental concerns and digitized resource maps as rationales for limiting mobility, even while the state's policies have contributed to conditions that lead to displacement, dispossession, and protracted statelessness.

Comparing Thailand and Türkiye

This manuscript emerged from conversations between the authors in discussion of our respective research on state identification and "management" of Indigenous communities, refugees, and "migrant workers" in Thailand (Flaim's work) and the protection and integration of Syrians (both those registered as refugees and those with other visa statuses or no legal standing) in Türkiye (Nawyn's work). While these are very different countries with different political systems, ethnic compositions, and histories of migration, we were struck by the many similarities in how the governments in question have implemented and justified the use of digital technologies for managing and restricting migration and associated registrations of non-citizen residents. Specifically, both nation-states are longstanding sites of UNCHR operations, and these camps, as well as the rural border zones and urban sprawls of Thailand and Türkiye, have been sites of primary refuge for millions of people fleeing conflict and related livelihood dispossessions for more than a decade. Currently, Thailand is host to millions of officially and unofficially registered refugees and migrant workers, primarily from Burma/Myanmar, as well as from Cambodia and Lao PDR. Thailand is also home to approximately 3 million Indigenous people who are members of 46 different ethnic communities, although most are members of communities in the northern highlands or southern coastal zones (Prasit, 2023). Highlanders and coastal Indigenous groups, in particular, have faced systematic deprivation of recognition of their Thai citizenship and dispossessions of their forest and coastal homelands. Türkiye is host to over 3.3 million registered Syrian refugees, with additional numbers of displaced Syrians that reside in Türkiye on different legal statuses (including unauthorized). It also hosts nearly 300,000 refugees and asylum seekers from other countries, making it one of the top hosting countries in the world. Like Thailand, nationalist conflicts have contributed to violence and instability in certain regions, mostly taking the form of surveillance and police oppression of Kurdish and Alevi communities.

At the same time that the two sites provide illuminating similarities in their unique geopolitical standings with regard to global migration in their respective regions, there are key differences in these two contexts with respect to climate change and state efforts to "manage" and otherwise limit access to land, resources, and life-sustaining water either via de jure law, policing, and borders, or by *de facto* policies. In the case of Thailand, both native-born highland Indigenous communities and their long-resident refugee kin face decades-long statelessness and yet reside in resource-rich forests, to which they rarely, if ever, possess stable land claims thereto. These forests, which have been long valued for their productive potential, are increasingly valued as carbon sinks, with associated policies and rhetoric that, analysis will show, continue to destabilize their claims to reside in, on, and with their forests. In the case of Türkiye, we turn a comparative eye to the conditions of immobility and resource precarity to which Syrian refugees are subject. While the relationship between climate change and the conflict in Syria is debatable, Syrian refugees are attempting long-term settlement in Turkish society in the context of scarcity of certain natural resources and development projects that at times exploit or exacerbate Syrian precariousness, and like many displaced populations, digital surveillance of Syrians is touted globally as a mechanism for ensuring their access to rights and managing Syrian protection with Türkiye but locally has very different consequences for Syrians' ability to have safe and secure lives. These differences in management and digitalization strategies, as we aim to clarify, illuminate how digitalization of ecologies can exacerbate vulnerabilities among already precariously statused, and hyper-surveilled, communities. With these considerations in mind, the comparative analysis highlights how identity and land digitalization campaigns may be shaping and threatening broader endeavors to advance social and climate/environmental justice.

Flaim's data on Thailand draw on 15 years of sustained ethnographic research on bureaucratic state management practices of stateless, refugee, and migrant communities in contexts across Northern, Central, and, to a lesser extent, Southern/coastal Thailand. Flaim's research derives from extended and collaborative ethnographic and mixed method engagements with stateless and formerly stateless Indigenous villagers and refugee communities as well as with migrant boys and men from Cambodia and Burma who are "working"—with highly varying degrees of volition—on long-haul Thai fishing boats. Her work is also informed by key informant interviews with state officials across multiple bureaucratic ministries and levels and by collaborations with human rights advocates and NGOs such as Project Issara, the Mekong School, the Intermountain Peoples Educational and Cultural Association of Thailand, and UNESCO. Interviews with and study of state bureaucrats have covered practices of registration and citizenship adjudication, and increasingly, forest and land-mapping practices. Nawyn's data come from interviews conducted over the course of 9 years with Syrian migrants, immigrant advocates, consulate and embassy staff, and government officials in Türkiye. Her work has focused on the state policies and non-governmental actors, and the relationship between the state and NGOs with regard to migration management. She has also interviewed Syrians about how they navigated state and UNHCR policies and used the resources of NGOs in Istanbul, collaborating with colleagues at Altınbaş University.

To compare these cases, we examine digitalization and technologies for identification, considering both the ways that governments deploy these technologies to surveil and 'manage'

populations, as well as how individuals may use these same technologies to claim rights or related forms of recognition. To analyze each context in parallel, we describe how digitalization is implemented in relation to precariously statused people, how the respective governments have integrated digitalization in the management of land and resources in the context of heightened climate volatility (and political panics related thereto), and the intersection of these digitalization campaigns in relation to both evidence of, and potential for, accelerating displacement and dispossession. We conclude with recommended strategies for scholars working in the field of digitalization intended to avoid overly simplistic conclusions about the promise of digital technologies, which we argue happens with unfortunate frequency in this literature.

Digitalization in Thailand

Thailand is a unique crucible of digitalization as governance due to its authoritarian political context, its central place in mainland Southeast Asia as a destination for refugees and migrants, and its rich, but degraded and contested, resources. While courageous movements for democratic reform have achieved various successes over the past 50 years, including in 2023, the country has been under military rule since 2019. It is regularly rated as "Not Free" by Freedom House with respect to both democratic norms and internet freedoms. Indeed, by every account, the current status of digital freedom for citizens and residents of Thailand, regardless of privilege, is very low. Conditions are particularly acute for millions of migrant workers and refugee residents in the country, as well as for two groups of native-born communities who are often cast as threats to national security and national development—Muslim Thai citizens in the south and Indigenous communities residing predominantly in the forested north-northwest (Jitpiromsri and McCargo, 2010; Bamrungchok, 2020; Haenssgen et al., 2022). The proceeding analysis, which focuses on conditions in the highlands, is not intended to dismiss concerns regarding state digitalization impacts on other communities. Rather, it is the state's campaign to digitalize its identification of highlanders while tacitly and explicitly dispossessing them of both citizenship and secure forest land claims in the context of climate change that warrants attention.

Campaigns of digitalization of migrants, refugees, and stateless persons

The Thai state's use of digitalization as a mode of identifying and sorting citizens from "non-citizen" residents has been in development for decades, in direct response to government perceptions of highland Indigenous communities as national security threats (Pinkaew, 2001; Keyes, 2002; Laungaramsri, 2003, 2014). In the state's campaign to thoroughly territorialize, each 'legal' resident—citizen or otherwise—is linked to an official household, which is tied to an official village or municipality, a subdistrict, district, and province, and then to Bangkok where the Ministry of the Interior officially approves and issues ID cards with a 13-digit code (Vandergeest and Peluso, 1995; Flaim, 2017). Non-citizen IDs and processing are linked analogously to the system used for citizens: All non-citizens are directly linked to a place they are located—either the village or household location for stateless

highlanders, a workplace for international "labor migrants," or refugee camp (processed by UNHCR).

The state deployed the first digitized registration campaign in the highlands in 1969 with the issuance of coins, on which a 6-digit ID number (in non-Thai script) is printed over a decontextualized map of Thailand. Thai script, which few highlanders could read at the time, describes the artifact as a "hill tribe" coin—hill tribe being the state's derogatory term deployed to describe and govern nine different ethnolinguistic groups residing predominantly in the north. A stylized profile of the now-deceased king adorns the flipside of the coin. Of particular significance, these early digitized IDs did *not* convey citizenship or land title but rather officially encoded the holder as a "hill tribe" (e.g., *not Thai*) resident, whose identity was officially (but rarely accurately) registered (Flaim, 2017). These digitized coins and their subsequent paper analogs perfectly represent Thongchai's (1994) concept of mapping as the production of the national "geo-body" in that they do not simply assert a bounded national territory but also reflect a set of national values and practices—most of which were alien to highland communities at the time.

From the 1970s through the late 1990s, in response to civil unrest and displacement across the region, the state issued numerous color-coded cards to groups considered 'migrants' and refugees, again signifying the non-citizen status of holders, and noting—to varying degrees of accuracy—the assumed origin of the holder (Pinkaew, 2001). Over the following two decades, more than 17 digitized ID cards were issued or reissued to people variably coded as "hill tribes," "immigrants," and "refugees," a process that expanded the state's capacity to monitor, surveil, and ultimately delimit the rights and claims of their holders and their children. Following the digitalization of blue citizen IDs in 2005, the government then consolidated the array of non-citizen IDs by issuing pink or white cards on which a 13-digit code refers to the status of the holder, and an array of rights limitations to which the holder is subject. In 2011, the then-democratically elected government elected to require children of age 7 to carry these cards as well. Per the logics of digitalization, holders of non-citizen ID cards are variously limited with respect to labor freedoms, freedom of mobility *within* and outside of the country, owning land, and conferring citizenship to their spouses and children.

Thailand's first attempt to implement biometric identification in 2005 was largely incomplete and riddled with complications (Kittima and Chuthathip, 2020), but in testing various schemes the state has collected a range of biometric data of migrant workers and refugees, Muslim citizens, and highlanders, often without their consent or understanding (Burt, 2019; Shakya, 2021). Currently, the government is rolling out a "National Digital ID" (NDID), the logo on which is a stylized fingerprint; while its focus appears largely to facilitate banking transfers and identity "verification," it promises complicated exclusions for the millions of non-citizens residing precariously in the country. Intensive studies of bureaucratic operations that adjudicate highlanders' citizenship claims (Flaim, 2017) and those that target refugee and immigrant communities (Reddy, 2015; Cheva-Isarakul, 2019) indicate that these operations are highly uneven and unjust. The state and quasi-state UNHCR camps are built on a messy "paper/ work" (Reddy, 2015) in which vast evidentiary gaps and mistakes produced by state registration campaigns are read as incontrovertible evidence of ineligibility (Flaim, 2017). In other words, the bureaucratic spaces and associated digitalization practices that are built to resolve statelessness and 'verify' migrant identities tend to reproduce and

extend exclusions. While 75% of stateless highlanders residing along the country's northern and northwestern borders had acquired legal recognition of their citizenship by 2010 (Flaim, 2017), ongoing research indicates that increasingly digitalized identification of highlanders and migrant workers, who are also required to possess color-coded digitized IDs anchoring them to particular occupations, is crystallizing a borderscape of exclusion and thus contributing to protracted conditions of statelessness, landlessness, immobility, and labor precarity.

Climate change and resource context

In a recent scientific analysis of factors ranging from extreme heat, deforestation rates, industrial development and energy dependence, agricultural productivity, rural–urban migration rates, to health risks, Thailand is considered "highly vulnerable" to climate change (Intergovernmental Panel on Climate Change, 2023). Rivers, coastal zones, and forests, which have been rapidly degraded, privatized, and/or otherwise enclosed to engineer rapid economic growth, are of particular concern in climate research as their conservation is considered critical for ensuring national resilience and sustainability. Yet, as discourse implicitly privileges *Thai* national conservation concerns, the very location of non-ethnically Thai residents of National Parks, contested forests, riverscapes, and coastal zones becomes a question of critical concern as well. For highlanders, in particular, climate change discourses carry echoes of state violence, dispossession, and displacement in the name of conservation (Ahlquist, 2015; World Rainforest Movement, 2023).

Decades before climate discourse entered the fray, the Thai government had been weaponizing forest conservation to refuse both land rights and citizenship to the highlanders who lived with/in them. Specifically, different groups' reliances on swidden agriculture—often derided and over-simplified as "slash-and-burn" farming—were conceived in both rhetoric and policy not only as a problem but also as a threat: the mobility of highlanders symbolizing a lack of loyalty to the monarchy and nation, and the use of fire cast as a threat to forests [see for instance, Pinkaew (2001) and Usher (2009)]. To this end, it is significant that large-scale conservation and forestry enclosures such as the National Park Act (1961) and the National Forestry Reserves Act (1964) were established prior to the registrations of highland communities who dwelled within them. To this end, the 6-digit code and image of the monarch on the 1969 "hill tribe" coin does more than simply reveal the state's project of digital registration and denial of recognition. It is the placement of the digital code on top of a disembodied, simplified map of Thailand that locates individuals within national borders while simultaneously obscuring their physical (and political) place in the nation. While analyzes focused primarily on identification regimes (e.g., Flaim, 2017) have overlooked this sleight of hand, highlanders themselves have long been aware of its effect: Indeed, they have courageously called for state recognition of their citizenship *and* land claims since the consolidation of a pan-highlander movement at the turn of the millennium (Prasit, 2019; Morton, 2023).

The full history of forest mapping exceeds the analytical bounds of this analysis, but it bears emphasizing Thongchai's (1994) argument that state efforts to map national boundaries were never intended to represent space as it "is," but to create, enforce, and naturalize national

we-they logics defined in reference to both external and *internal* "Others." Indeed, the state's use of increasingly sophisticated, digital technologies to demarcate forest bounds is part of its often violent and extortionate enforcement thereof, not only by armed Forestry guards but also variably by border police patrols, military units, and Thai police stationed at any of the hundreds of internal checkpoints constituting a borderscape designed to check IDs and delimit internal mobility of non-citizens. Although the threat of forced displacement of entire communities from forests is no longer a widespread concern, the murder and disappearance of Karen activist "Billy" Porlajee Rakchongcharoen and the ongoing harassment of Karen residents in the Kaeng Krachan Forest Complex are only two recent examples of a longer pattern of weaponizing individual surveillance, mapping, and forest conservation to threaten violent dispossession communities from their homes (see also, Ahlquist, 2015). To this end, it is the combination of increasingly digitized identification alongside ostensibly disparate conservation and growing climate discourses and enclosures that have a) functionally immobilized entire communities from practicing traditionally mobile livelihoods (Feingold, 2000; Ahlquist, 2015; World Rainforest Movement, 2023) while b) preventing non-citizens from using migration and legal wage labor as "resilience strategies" in the face of state-produced landlessness and resource scarcity.

Implications of the changing context for precariously statused communities

In recent years, the state has initiated a series of acts, policies, and agendas, from the 2014 Forest Master Plan, Thailand OneMAP, and the 2019 National Parks Act, to actively (re)shape state-highlander relationships to the forest. While varied in scope, these overlapping agendas broadly aim to clarify incongruencies between the different maps of National Parks, protected forests, and conservation zones that have been produced by different ministry and department maps over the decades (World Rainforest Movement, 2014; RECOFT, 2020; Damon, 2021). In addition to streamlining governance, the state is pursuing these projects for the explicit purposes of accelerating forest regeneration, reducing land conflict, certifying land claims (for citizens *only*), and eliminating "forest encroachment" (World Rainforest Movement, 2014, 2023; Haenssgen et al., 2022). Communities are incentivized to participate in these schemes, which rely on "participatory" GIS and GPS technologies to demarcate land claims, with the promise of receiving "recognition and rights" to use their land for 20 years, provided state officials certify their claims (RECOFT, 2020; see also Faxon et al., 2022).

While these schemes remain underway, early research suggests that they are rife with confusion, tension, and potential for land dispossession (World Rainforest Movement, 2014; Damon, 2021; see also Goldstein and Faxon, 2022). Moreover, while some highland communities and NGOs welcome digitalization policies, World Rainforest Movement (2014) raises serious concerns about the ways that forestry and Park officials can "clarify" incongruencies in land claims by weaponizing their disproportionate access to digital technologies and government bureaucracies, and labeling longtime village residents as "encroachers" (see also, Haenssgen et al., 2022). This is to say nothing of the use of digitalized forest maps to ensure the absolute erasure of stateless residents' claims, who are barred from participating (Chutima "Miqjur" Morlaeku, pers. comm, 15 April

2019). In these instances, to be digitally identified as a non-citizen is tantamount to 'efficient' dispossession of land.

Digitalization in Türkiye

As a migrant transit country for much of its modern history, Türkiye did not have until recently any national-level migration management infrastructure and did not invest significant labor in policing its national borders. Temporary visas of 90 days were easy to acquire, and there were established circular migration patterns of people coming from nearby countries to find seasonal work, purchase goods to sell in their home country, or engage in other forms of economic activity. Longer term visas were processed by municipal police, who used paper copies and gave applicants slips of paper with tracking numbers that they would use to pick up their visas (again, on paper) a week or so later. Police officers would even type the information on visa forms using electric typewriters. Irregular migration into Türkiye was common, including migrants who could be categorized as refugees, and the government infrequently identified visa overstayers (İçduygu, 2003, 2008).

The civil war in neighboring Syria represents a shift in Türkiye's migration history. It occurred at a time when the ruling Justice and Development (AKP) party won a landslide victory in the 2011 election, and Prime Minister Recep Tayyip Erdoğan was at the pinnacle of his political. AKP was increasing the centralization of the Turkish government and expanding development projects that impacted natural resource management. While the influx of Syrian refugees presented challenges to Türkiye, the new context was also harnessed for the benefit of AKP's domestic and international agenda.

Campaigns of digitalization of migrants, refugees, and stateless persons

With the mass movement of Syrians fleeing civil war, the Government of Türkiye created an infrastructure for managing (which included monitoring) migrants who were refugees or potential refugees in need of international protection, differentiating refugees who were of higher priority to Türkiye's national interests, and processing and removing unwanted migrants. They accomplished this with the passing of the Law on Foreigners and International Protection (LFIP) in 2014, which established a government agency (the Directorate General of Migration Management) to process the protection of refugees and determine which migrants qualified as Syrian refugees, non-Syrian refugees, and which migrants could be detained and removed. For the first time in the country's history, this law provided a mechanism for refugees to seek protection in Türkiye and access certain citizenship rights, such as the right to residency, to work, and to attend school. Syrians are given special dispensation as refugees, with greater access to rights than other refugee groups. More recent legislation has created a path to citizenship but only for those that fill higher-skilled gaps in the Turkish labor market.

The Government of Türkiye has not instituted digital surveillance of citizens to the extent that the Thai government has, but it has expanded its digital data collection and surveillance substantially with the passage of the LFIP. The Ministry of Interior has administered a biometric ID card to every registered Syrian in Türkiye, which authenticates not only the identity of each registered Syrian but

includes their assigned residential location in the country. Syrians registered as refugees under the LFIP are required to reside in a particular location of Türkiye, which tends to be removed from major ports of exit toward Europe (primarily Istanbul but also Izmir, along the Mediterranean coast), and often are far away from any major urban populations. The Directorate General of Migration Management, the government agency created under the LFIP to manage migration in Türkiye, maintains access to Syrian biometric data, as do Turkish police. Syrians, in turn, must present this ID card to access healthcare services, enroll in school, rent accommodations, and access other forms of government-sponsored social assistance.

Climate change and resource context

In an early analysis of the Syrian refugee crisis, scholars proposed that climate change was a precipitating factor in the Syrian civil war. Drought brought on by climate shifts was thought to have left farmers looking for new livelihoods in urban areas, which led to unrest in the cities and precipitated political protests. That narrative has been challenged by recent research, which notes that cropland recovered quickly from the 2006–2008 drought (Eklund et al., 2022). Furthermore, as Ahuja (2021) argues, the relationship between climate change and conflict is complex and intertwined with "longer processes of colonialism and racial disposability generated by extractive capitalist development" (p.11). Any connections between drought, rural-to-urban migration, and conflict in Syria were not inevitable and to associate Syrian migration with climate change taps into an existing discourse of climate migrants as threats to security rather than the victims of insecurity (Daoudy, 2020) and downplays the decision of the Assad regime to commit violence against its own citizenry. Regardless, Syrians in Türkiye by and large do not consider themselves to be climate migrants, and while some Syrian refugees had previously lived in agricultural areas, most in Istanbul and all those participating in Nawyn's research had come from urban areas. Whether or not Syrians in Türkiye are legally registered as refugees, their displacement was directly driven by violence and persecution, which justifies their access to the resources legally afforded to refugees (resources that are not extended to climate migrants under international law).

Türkiye's hosting of Syrian refugees starting in 2011 occurred within a context of significant development that began decades before, with large public and private investments in energy production, telecommunications, expanding higher education, and water management. This investment, which the World Bank (2015) referred to as the "Anatolian Tigers," has been almost entirely focused on urbanization with the goal of moving Türkiye from a middle-to high-income country. Digitalization of this development is uneven as sources of digital data are of mixed quality and different data sources are not well integrated (Aksu and Iban, 2019). There is ample evidence that the benefits of this development have not been equally distributed to all populations within Türkiye. Just one example is the construction of Tarlabaşı 360, an urban redevelopment project that is displacing many Syrian refugees, Kurds, and other precariously statused groups from a central location in Istanbul for an upscale housing and shopping district. The rhetoric promoting the project openly described the pre-development population of Tarlabaşı as "squalid" and "deprived," thereby touting the benefits of replacing that population with more economically privileged residents.

Development has also affected drinking water supplies in Istanbul. Large-scale construction in previously forested areas potentially put drinking water supplies at risk. As of this writing, the tap water in Istanbul is considered safe to drink, but because of safety concerns and the perception of the unpleasant taste of the water, most middle-class Turks consume bottled water. Therefore, if development endangers the city's water supply, it will be economically precarious populations who will be detrimentally affected.

Not all Syrian refugees are economically precarious; according to a recent report, between 2 and 3% of the over 3 million Syrian refugees in Türkiye could be categorized as elites (Chang, 2022) and that does not include the many Syrians who entered Türkiye on business, educational, or other visa statuses. The creation of the Syrian International Business Association (SIBA) in 2018 consolidated the growing influence of Syrian business elites in the country. While there has been no systematic assessment of the alignment of SIBA members with government interests in economic development and natural resource management, its mission is explicitly to capitalize on market opportunities in the host country, which could enrich its own members but increase the precarity of Syrians who are suffering under the Turkish government's development policies. Of particular note, Syrian elites also have ready access to Turkish citizenship, which releases them from the digital surveillance, precarious livelihoods, and resource risks to which non-citizen Syrians are subject.

Implications of the changing context for precariously statused communities

Like with refugees and highlanders in Thailand, identity digitalization is used to limit the internal and international mobility of Syrians in Türkiye. Our fieldwork has recorded stories of Turkish police stopping busses en route between cities, requiring passengers to show identification, and apprehending any Syrian refugees shown to be outside of their assigned residential area. Our records are corroborated by news reports that indicate apprehended Syrians are kept in custody until they sign voluntary orders of return (sometimes under duress or torture) and then taken to the Syrian border.

Limiting internal mobility is one way that Türkiye keeps Syrians from migrating internationally to Greece and other countries in the EU. Per the EU/Turkey deal of 2016, the Turkish government is required to increase border controls between the country and the EU and to accept any migrants the EU returns who were thought to have passed through Türkiye. Following the signing of the deal, Türkiye moved the residency of Syrians away from cities that served as ports of entry to Europe, including low-cost neighborhoods in Istanbul. This also served to facilitate planned gentrification of those neighborhoods such as Tarlabaşı, which as we noted earlier is prime real estate for development. Tying Syrians to predetermined residential locations also ensured the availability of cheaper Syrian labor in parts of Türkiye that had low-wage labor shortages.

Whereas in Thailand the government digitally surveils highlanders and continues to dispossess them of secure land rights, the Government of Türkiye digitally ties Syrians to land, and they are the labor that extracts value from that land. Syrians fill low-wage labor needs in cities such as Istanbul, but in the eastern part of the country they have joined ethnic Kurds in the agricultural sector. The flexibility (i.e., precarity) of Syrian refugees as agricultural laborers has become more useful for

ensuring the profitability of Turkish crops as climate change has made agricultural production less predictable. In this way, Syrians serve as a source of surplus labor and positioning them within Turkish society similarly to other oppressed groups, a positioning that is similar to how refugees' labor has been exploited in other countries such as Hungary (Rajaram, 2018) and the US (Nawyn, 2010). This dynamic forces Syrians to stay in regions (and jobs) they may want to leave or risk losing refugee protections, but it also disincentivizes the Government of Türkiye to adjust its agricultural policies to accommodate or mitigate climate change. While Syrians can theoretically gain citizenship in Türkiye, only about 210,000 have as of May 2023 (Glinski, 2023). The flexible Syrian workforce has the potential to grow faster than the population of Syrians with Turkish citizenship as Türkiye does not grant birthright citizenship and children born of one or two Syrian parents are at risk of being stateless (Levkowitz, 2023).

Discussion

Analytic comparison of how identity digitalization is impacting highland Indigenous communities in Thailand and Syrian refugees in Türkiye reveals how state efforts to streamline registration for bureaucratic efficiency are producing heightened life and livelihood precarity for already disenfranchised and vulnerable groups. Even despite the tremendous contextual differences across these two sites, the cases indicate that digital(ized) registration without citizenship recognition—whether in the form of a coin or a biometric ID—extends state power to surveil, monitor, immobilize, or displace people. These arguments and developments, in and of themselves, are not new (Torpey, 2000; Caplan and Torpey, 2001; Breckenridge and Szreter, 2012). Close interrogation and comparison of these two cases also reveal that a sole analytic focus on identification strategies without concomitant attention to the ways these projects shape and destabilize communities' complex relationships to land, water, and life-sustaining resources will obscure the precarity produced by digitalization in the Anthropocene in two key ways: First, the experiences of Syrians in Türkiye reveal how digitalization is shaping and destabilizing stable housing and sustainable livelihoods and exacerbating problems such as access to clean water, all of which are viewed as fundamental elements of "resilience strategies" in the increasingly resource-scarce context of the Anthropocene. Second, as the experiences of highland Indigenous communities in Thailand reveal, the Thai state initiated digital identity registration as an *extension of* its broader agenda to nationalize forests and dispossess forest-dwelling communities of land rights. Digitalization of identity is a project that is directly tied to resource and land enclosures, dispossessions, and contestations that are signatures of the Anthropocene itself. As Thailand, such as states worldwide, increasingly deploys remote, digital technologies to enforce land enclosures and related dispossessions, the engagement of *citizen* highlanders in "participatory" GIS mapping of their land risks further naturalizing the very relationships that accelerate dispossession and contestation in the first place.

Despite the many differences between Thailand and Türkiye, when comparing how these states are deploying digitalization to identify (and naturalize taxonomies of) stateless, refugee, and migrant populations within contexts of heightened resource contestation, we have identified a number of similarities that may point to global trends. Given the ways in which digitalization emerges in our field sites, we conclude that the question is not how digital technologies can be used to solve the

mounting challenges of climate-induced displacements, but in what ways these technologies may be facilitating these displacements and dispossessions (see Coulthard, 2014 for related critiques of the politics and programs of 'recognition.'). At the same time, this increased surveillance and movement restriction can and does coincide with the use of digital technologies to connect migrants to resources such as refugee recognition, schooling, and, to a highly variable extent, state and non-governmental aid. These are not mutually exclusive processes, and the sustainability of progressive digital technologies and programs to assist migrants, refugees, and stateless people is dependent on precarious funding streams and the same national logics that produce displacement, dispossession, and statelessness.

Thus, we call for a more nuanced analysis of the scientific data and discourse on digitalization and climate change. Beyond identifying how technologies are being used and how those uses are affecting different groups of precariously statused people, we need to focus attention on who or what controls the technologies of digitalization, who or what determines how data are collected and by what logics, who and/or what has access to those data, and who and/or what determines how these data will be interpreted and used. Do refugees, stateless people, Indigenous peoples, and others facing disproportionate impact and displacement in the context of climate change have a realistic opportunity to consent to their data being collected (Haenssgen et al., 2022)? To this latter point, the case of Syrians in Türkiye and highlanders in Thailand reveals that already-displaced and dispossessed communities can rarely, if ever, refuse the use of their data, as the data collection and ownership by the state are a pre-requisite of receiving the benefits of recognition. To be recognized by the Thai government as temporary residents with even limited rights, stateless highlanders, refugees, and migrant workers must submit themselves to laborious, risky, and expensive registration campaigns—the digitization of which serves to maintain their precarious status rather than to resolve it. To have their status as refugees recognized by the Turkish government, Syrians must be registered and must be assigned a biometric identification.

For Syrians in Türkiye or for highlanders, refugees, and migrants in Thailand, refusal of identity datafication would be tantamount to refusing access to monetary assistance, healthcare, public education, legal work, land, stable housing, and *relatively* free mobility. Moreover, refusing datafication constitutes a refusal of potential citizenship claims for themselves and their children, as neither state recognizes birthright citizenship outright. Therefore, these particularly precariously statused groups, such as those worldwide, have no realistic ability to consent to the use of their data, and no real rights to privacy or control over their data. Given that reality, one might assume that few would rarely if ever refuse digital identification, yet many Syrians do. While Flaim has never encountered a person who has refused registration in Thailand, many interlocutors have told stories about trying to navigate and exploit inconsistencies and gaps in digitizing registration processes to secure claims to citizenship, birth registration, and legal residency (see Flaim, 2015). Because biometric, digitalized IDs are designed precisely to prevent and preclude gaps or inconsistencies in the identification of human beings, opportunities for pursuing creative solutions to avoid permanent exclusion are quickly closing in sites such as Thailand and Türkiye, where biometric identification strategies are expanding and normalizing. In both instances, we argue that migrants, stateless, and refugee communities such as those in Thailand and Türkiye already understand a reality that humanitarian organizations pushing for greater digitalization are ignoring; the same identity data deployed to provide state assistance to refugees, migrants, and 'vulnerable' communities can be deployed easily to detain, displace, deport, dispossess, and/or immobilize them. Precariously statused people, families, and communities who eschew digitalization are exchanging the benefits of humanitarian assistance for the opportunity to avoid the surveillance, limits, and immobilization that come with digitalization.

Stateless, migrant, and refugee communities are subject to heightened precarity with the advance of identity digitalization. These conditions of precarity likely will be *exacerbated* by further efforts to digitalize land and resources under the volatile conditions of the Anthropocene. Not only does identity digitalization attend surveillance and control efforts by states and capital but also digitalization of land, water, and valuable resources likewise attends attempts to territorialize, enclose, privatize, and otherwise delimit access thereto. Seen through this lens, the digitalization of identity in regions of extensive resource contestation, scarcity, and enclosure is likely to further exacerbate conditions of dispossession and exclusion experienced by stateless, refugee, and migrant communities, in particular.

Ethics statement

The studies involving humans were approved by Michigan State University Human Research Protection Program. The studies were conducted in accordance with the local legislation and institutional requirements. The ethics committee/institutional review board waived the requirement of written informed consent for participation from the participants or the participants' legal guardians/next of kin because to avoid creating a paper trail that could make participants feel unsafe.

Author contributions

Acknowledgments

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Ahlquist, D. (2015). *Losing place in the Corn Mountains: Forest conservation, in situ displacement & Agrarian Transformation in upland northern Thailand* Cornell University Ithaca, NY.

Ahuja, N. (2021). *Planetary specters: Race, migration, and climate change in the twenty-first century*. Chapel Hill, NC: University of North Carolina Press.

Aksu, O., and Iban, M. C. (2019). Considerations on the land management system approach in Turkey by the experiences of a case study. *Surv. Rev.* 51, 87–96. doi: 10.1080/00396265.2017.1383711

Anderson, B. (1983). *Imagined communities*. London: Verso Books.

Ayeb-Karlsson, S. (2020). When the disaster strikes: gendered (im)mobility in Bangladesh. *Clim. Risk Manag.* 29:100237. doi: 10.1016/j.crm.2020.100237

Bamrungchok, D. (2020). A glimpse at Thailands digital ID through the biometric profiling of Malay Muslims. Global Voices. Available at: https://advox.globalvoices.org/2020/05/18/a-glimpse-at-thailands-digital-id-through-the-biometric-profiling-of-malay-muslims/ (accessed May 13, 2023).

Bettini, G., Gioli, G., and Felli, R. (2020). Clouded skies: how digital technologies could reshape "loss and damage" from climate change. *Wiley Interdiscip. Rev. Clim. Chang.* 11:e650. doi: 10.1002/wcc.650

Bither, J., and Ziebarth, A. (2021). "Automating decision-making in migration policy: a navigation guide." a publication of the migration study group on international cooperation and development, November 2021. Available at: https://www.bertelsmann-stiftung.de/fileadmin/files/Projekte/Migration_fair_gestalten/IB_Automating_Decisionmaking_in_Migration_Policy_MSG_2021.pdf

Black, R., Bennett, S. R. G., Thomas, S. M., et al. (2011). Migration as adaptation. *Nature* 478, 447–449. doi: 10.1038/478477a

Bluwstein, J. (2019). Resisting legibility: State and conservation boundaries, pastoralism, and the risk of dispossession through geospatial surveys in Tanzania. *Rural Landscapes: Soc, Environ, Hist* 6:1. doi: 10.16993./rl.53

Breckenridge, K., and Szreter, S. (eds). (2012). *Registration and recognition: Documenting the person in world history*, Oxford: Oxford University Press.

Burt, C. (2019). Thailand orders facial biometrics collection for SIM use in Muslim-majority states. Biometric Update. Available at: https://www.biometricupdate.com/201906/thailand-orders-facial-biometrics-collection-for-sim-use-in-muslim-majority-states

Burzyński, M., Deuster, C., Docquier, F., and De Melo, J. (2022). Climate change, inequality, and human migration. *J. Eur. Econ. Assoc.* 20, 1145–1197. doi: 10.1093/jeea/jvab054

Caplan, J. (2001). "'This or that particular person': protocols of identification in nineteenth century Europe" in *Documenting individual identity: The development of state practices in the modern world*. eds. J. Caplan and J. Torpey (Princeton, NJ: Princeton University Press), 49–66.

Caplan, J., and Torpey, J. (2001). "Introduction" in *Documenting individual identity: The development of state practices in the modern world*. eds. J. Caplan and J. Torpey (Princeton, NJ: Princeton University Press), 1–12.

Chang, C.-A. (2022). A more effective refugee policy: reinvestigating the socio-economic composition of Syrian refugees in Turkey. *Insight Turkey* 24, 135–152. doi: 10.25253/99.2022241.8

Cheva-Isarakul, J. (2019). Diagnosing statelessness and everyday state illegibility in northern Thailand. *Statelessness Citizenship Rev.* 1:214. doi: 10.35715/SCR1002.112

Chouliaraki, L., and Georgiou, M. (2022). *The digital border: Migration, technology, power*. New York: NYU Press.

Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. Minneapolis: University of Minnesota Press.

Creutzig, F., Acemoglu, D., Bai, X., Edwards, P. N., Hintz, M. J., Kaack, L. H., et al. (2022). Digitalization and the Anthropocene. *Annu. Rev. Environ. Resour.* 47, 479–509. doi: 10.1146/annurev-environ-120920-100056

Cundill, G., Singh, C., Adger, W. N., Safra, R., de Campos, K., Vincent, M. T., et al. (2021). Toward a climate mobilities research agenda: intersectionality, immobility, and policy responses. *Glob. Environ. Chang.* 69:102315. doi: 10.1016/j.gloenvcha.2021.102315

Damon, C. (2021). "Khor tor Chor KTC" in *Matrix of land policies in northern Thailand. Workshop presentation* (Ann Arbor, MI: Political Ecology @ University of Michigan)

Daniel, D., and Speranza, C. I. (2020). The role of blockchain in documenting land users' rights: the canonical case of farmers in the vernacular land market. *Front. Blockchain* 3:19. doi: 10.3389/fbloc.2020.00019

Daoudy, M. (2020). *The origins of the Syrian conflict: Climate change and human security*. Cambridge: Cambridge University Press.

Dwivedi, Y. K., Hughes, L., Kar, A. K., Baabdullah, A. M., Grover, P., Abbas, P., et al. (2022). Climate change and COP26: Are digital technologies and information management part of the problem or the solution? An editorial reflection and call to action. *International Journal of Information Management* 63:102456.

Eklund, L., Theisen, O. M., Baumann, M., Tollefsen, A. F., Kuemmerle, T., and Nielsen, J. Ø. (2022). Societal drought vulnerability and the Syrian climate-conflict nexus are better explained by agriculture than meteorology. *Commun. Earth Environ.* 3:85. doi: 10.1038/s43247-022-00405-w

Elder, K., Xirasagar, S., Miller, N., Bowen, S. A., Glover, S., and Piper, C. (2007). African Americans' decisions not to evacuate New Orleans before hurricane Katrina: a qualitative study. *Am. J. Public Health* 97, S124–S129. doi: 10.2105/AJPH.2006.100867

Faxon, H. O., Jenny, G., Micah, F., and Hunt, G. (2022). Territorializing spatial data: controlling land through one map projects in Indonesia and Myanmar. *Polit. Geogr.* 98:102651. doi: 10.1016/j.polgeo.2022.102651

Feingold, D. A. (2000). "The hell of good intentions: some preliminary thoughts on opium in the political ecology of the trade in girls and women" in *Where China meets Southeast Asia: Social & cultural change in the border regions*. eds. G. Evans, C. Hutton and K. K. Eng (New York: Palgrave Macmillan US), 183–203.

Feldman, S., Geisler, C., and Menon, G. A. (Eds). (2011). *Accumulating insecurity: Violence and dispossession in the making of everyday life*. Athens: University of Georgia Press.

FitzGerald, D. S. (2019). *Refuge beyond reach: How rich democracies repel asylum seekers*. Oxford: Oxford University Press.

Flaim, A. (2015). *"No Land's man: sovereignty, legal status, and the production of statelessness among highlanders in northern Thailand" Doctoral dissertation*. Ithaca, NY: Cornell University.

Flaim, A. (2017). "Problems of evidence, evidence of problems: Expanding citizenship and reproducing statelessness among highlanders in Northern Thailand", in *Citizenship in question: Evidentiary birthright and statelessness*. eds. B. Lawrance and J. Stevens (Durham, NC: Duke University Press), 159–161.

Gillespie, M., Osseiran, S., and Cheesman, M. (2018). Syrian refugees and the digital passage to Europe: smartphone infrastructures and affordances. *Soc. Media Soc.* 4:2056305118764440. doi: 10.1177/2056305118764440

Glinski, S. (2023). "'New Turks' are all in for Erdogan." Foreign Policy. Available at: https://foreignpolicy.com/2023/05/10/turkey-election-erdogan-kilicdaroglu-immigration/

Glouftsios, G., and Scheel, S. (2021). An inquiry into the digitisation of border and migration management: performativity, contestation and heterogeneous engineering. *Third World Q.* 42, 123–140. doi: 10.1080/01436597.2020.1807929

Goldstein, J. E., and Faxon, H. O. (2022). New data infrastructures for environmental monitoring in Myanmar: is digital transparency good for governance? *Environ. Plan. E Nat. Space* 5, 39–59. doi: 10.1177/251484862094389

Hadi, T., Islam, S., Richter, D., and Fakhruddin, B. (2021). Seeking shelter: the factors that influence refuge since cyclone Gorky in the coastal area of Bangladesh. Progress in disaster. *Science* 11:100179. doi: 10.1016/j.pdisas.2021.100179

Haenssgen, M. J., Lechner, A., Rakotonarivo, S., Leepreecha, P., Sakboon, M., Chu, T.-W., et al. (2022). Implementation of the COP26 declaration to halt forest loss must safeguard and include indigenous people. Correspondence: nature. *Ecol. Evol.* 6, 235–236. doi: 10.1038/s41559-021-01650-6

İçduygu, A. (2003). Irregular migration in Turkey-An overview. *IOM Migration Research Series* 17–28.

İçduygu, A. (2008). *Rethinking irregular migration in Turkey: some demo-economic reflections in CARIM AS 72*, Robert Schuman Centre for Advanced Studies, San Demonico di Fiesole (FI): European University Institute.

Intergovernmental Panel on Climate Change. (2023). *Climate change 2022 – Impacts, adaptation and vulnerability: Working group II contribution to the sixth assessment report of the intergovernmental panel on climate change*. Cambridge: Cambridge University Press

Jakob, M. (2022). Globalization and climate change: state of knowledge, emerging issues, and policy implications. *Wiley Interdiscip. Rev. Clim. Chang.* 13:e771. doi: 10.1002/wcc.771

Jitpiromsri, S., and McCargo, D. (2010). The southern Thai conflict six years on: insurgency, not just a crime. *Contemp. Southeast Asia* 32, 156–183. doi: 10.1355/cs32-2b

Kaurin, D. (2019). Data protection and digital agency for refugees (2019). World refugee council research paper No. 12. Available at: https://www.cigionline.org/sites/default/files/documents/WRC%20Research%20Paper%20no.12.pdf

Keyes, C. (2002). Presidential address: "the peoples of Asia"—science and politics in the classification of ethnic groups in Thailand, China, and Vietnam. *J. Asian Stud.* 61, 1163–1203. doi: 10.2307/3096439

Kittima, L., and Chuthathip, M. (2020). Digital ID in Thailand: a case study. The engine room. Report. Available at: https://www.digitalid.theengineroom.org

Laungaramsri, P. (2003). Ethnicity and the politics of ethnic classification in Thailand. *Ethic. Asia*, 157–173. doi: 10.4324/9780203380468_CHAPTER_9

Laungaramsri, P. (2014). "Contested citizenship: cards, Colors and the culture of identification. Ethnicity, Borders, and the grassroots Interface with the state: studies on Southeast Asia" in *Honor of Charles*. ed. F. Keyes (Chiang Mai: Silkworm Books), 143–164.

Leese, M., Noori, S., and Scheel, S. (2022). Data matters: the politics and practices of digital border and migration management. *Geopolitics* 27, 5–25. doi: 10.1080/14650045.2021.1940538

Levkowitz, J. (2023). Turkey's xenophobic turn targets stateless Syrians. Foreign Policy. Available at: https://foreignpolicy.com/2023/03/26/turkey-stateless-syrians-earthquake-elections-erdogan-assad/

Liu, J., and Sengers, P. (2021). Legibility and the legacy of racialized dispossession in digital agriculture. *Proc. ACM Hum. -Comput. Interact.* 51:480. doi: 10.1145/3479867

Low, C. C. (2021). Digitalization of migration management in Malaysia: privatization and the role of immigration service providers. *J. Int. Migr. Integr.* 22, 1599–1627. doi: 10.1007/s12134-021-00809-1

Madianou, M. (2019a). Technocolonialism: digital innovation and data practices in the humanitarian response to refugee crises. *Soc. Media Soc.* 5:2056305119863146. doi: 10.1177/2056305119863146

Madianou, M. (2019b). The biometric assemblage: surveillance, experimentation, profit, and the measuring of refugee bodies. *Telev. New Media* 20, 581–599. doi: 10.1177/1527476419857682

Mitchell, T. (2002). *Rule of experts: Egypt, techno-politics, modernity*. Berkeley, CA: University of California Press.

Morton, M. F. (2023). Multiculturalism from below: indigeneity and the struggle for recognition in Thailand. *J. Anthropol. Res.* 79, 3–30. doi: 10.1086/723074

Nawyn, S. J. (2010). Institutional structures of opportunity in refugee resettlement: gender, race/ethnicity, and refugee NGOs. *J. Sociol. Soc. Welf.* 37, 149–167. doi: 10.15453/0191-5096.3498

O'Toole, M. (2021). "Exclusive: Biden has quietly deployed an app for asylum seekers. Privacy experts are worried." Los Angeles Times. Available at: https://www.latimes.com/politics/story/2021-06-04/asylum-bidens-got-an-app-for-that-with-privacy-risks-and-surveillance-beyond-border

Oh, S.-A. (2017). "*Surveillance and control: The encampment and biometric identification of Rohingya refugees in Bangladesh*." ISEAS-Yusof Ishak Institute. Singapore

Panigrahi, S. (2022). Marginalized Aadhaar: India's Aadhaar biometric ID and mass surveillance. *Interactions* 29, 16–19. doi: 10.1145/3517173

Pei, Q., Nowak, Z., Li, G., Xu, C., and Chan, W. K. (2019). The strange flight of the peacock: farmers' atypical Northwesterly migration from Central China, 200 BC–1400 AD. *Ann. Am. Assoc. Geogr.* 109, 1583–1596. doi: 10.1080/24694452.2019.1570837

Pinkaew, L. (2001). *Redefining nature: Karen ecological knowledge and the challenge of the modern conservation paradigm*. Chennai: Earthworm Books.

Pragg, V. L. (2021). Can I move or can I stay? Applying a life course perspective on immobility when facing gradual environmental changes in Morocco. *Clim. Risk Manag.* 31:100274. doi: 10.1016/j.crm.2021.100274

Prasit, L. (2019). Becoming indigenous peoples in Thailand. *J. Southeast Asian Stud.* 50, 32–50. doi: 10.1017/S0022463419000183

Prasit, L. (2023). "Empowering the margins': the roles of NGOs among ethnic highlanders in Thailand" in *Keynote address. Council on Thai studies annual conference* (DeKalb, IL: Northern Illinois University)

Prasse-Freeman, E. (2022). Nothing to lose but their (block)chains: biometrics, techno-imaginaries, and transformations in Rohingya lives. *Am. Ethnol.* 49, 1–17. doi: 10.1111/amet.13100

Rajaram, P. K. (2018). Refugees as surplus population: race, migration and capitalist value regimes. *New Political Econ.* 23, 627–639. doi: 10.1080/13563467.2017.1417372

RECOFT (2020). Forest communities in Thailand use mapping technology to secure and manage their land. Available at: https://www.recoftc.org/stories/forest-communities-thailand-use-mapping-technology-secure-and-manage-their-land

Reddy, M. (2015). Identity paper/work/s and the unmaking of legal status in Mae Sot, Thailand. *Asian Journal of Law and Society* 2, 251–266. doi: 10.1017/als.2015.16

Schoemaker, E., Baslan, D., Pon, B., and Dell, N. (2021). Identity at the margins: data justice and refugee experiences with digital identity systems in Lebanon, Jordan, and Uganda. *Inf. Technol. Dev.* 27, 13–36. doi: 10.1080/02681102.2020.1785826

Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. New Haven: Yale University Press.

Shakya, P. (2021). "Cybersecurity in the Mekong region: An analysis of the legal framework and recommendations for the protection of indigenous environmental human rights defenders." Asia Indigenous Peoples Pact and International Work Group for Indigenous Affairs. Available at: https://www.iwgia.org/en/resources/publications/4525-cybersec-mekong.html

Skinner, D. (2020). Race, racism, and identification in the era of Technosecurity. *Sci. Culture* 29, 77–99. doi: 10.1080/09505431.2018.1523887

Stock, R., and Garzedi, M. (2022). Arrays and algorithms: emerging regimes of dispossession at the Frontiers of agrarian technological governance. *Earth System Governance* 12:100137. doi: 10.1016/j.esg.2022.100137

Szreter, S. (2007). The right of registration: development, identity registration, and social security–a historical perspective. *World Dev.* 35, 67–86. doi: 10.1016/j.worlddev.2006.09.004

Thongchai, W. (1994). *Siam mapped: A history of the geo-body of a nation*. Honolulu: University of Hawaii Press.

Torpey, J. (2000). *The invention of the passport: Surveillance, citizenship, and the state*, New York: Cambridge University Press.

Tynen, S. (2022). Islamophobia, terrorism and the Uyghurs: when minorities in China find themselves on the wrong side of the counterterrorism discourse. *Geopolitics* 27, 360–365. doi: 10.1080/14650045.2021.1924939

Usher, A. D. (2009). *Thai forestry: A critical history*. Chiang Mai, Thailand: Silkworm Books.

Vandergeest, P., and Peluso, N. L. (1995). Territorialization and state power in Thailand. *Theory Soc.*, 24, 385–426. doi: 10.1007/BF00993352

Weitzberg, K., Cheesman, M., Martin, A., and Schoemaker, E. (2021). Between surveillance and recognition: rethinking digital identity in aid. *Big Data Soc.* 8, 1–17. doi: 10.1177/20539517211006744

Witteborn, S. (2022). Digitalization, digitization and datafication: the" three D" transformation of forced migration management. *Commun. Cult. Crit.* 15, 157–175. doi: 10.1093/ccc/tcac007

World Bank. (2015). Rise of the Anatolian tigers: Turkey urbanization review, Main Report. Policy brief; Washington, DC. Available at: http://hdl.handle.net/10986/22388

World Rainforest Movement (2014). "Thailand's new 'forestry master plan': Same old strategy dressed up in new clothes". Available at: https://www.wrm.org.uy/bulletin-articles/thailands-new-forestry-master-plan-same-old-strategy-dressed-up-in-new-clothes

World Rainforest Movement (2023). "Thailand: Valuing forests as carbon credits. Available at: https://www.wrm.org.uy/bulletin-articles/thailands-new-forestry-master-plan-same-old-strategy-dressed-up-in-new-clothes