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#### RESEARCH



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# The role of institutions in food system transformations: lessons learned from transdisciplinary engagements in Ethiopia, the Philippines, and Indonesia

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#### ABSTRACT

In many parts of the Global South, food systems are confronted with complex sustainability challenges including high levels of poverty, food insecurity, malnutrition, disempowerment, and degraded environments. Transformation is broadly discussed in research, policy, and planning as the systemic change required to address complex sustainability issues. Transformation of food systems has become a global priority for research and action. However, transformation processes are not neutral, but are associated with losses and gains that are unevenly distributed. Institutions play an important role in relation to how transformation of food systems occur and with what outcomes. Empirical understandings of how institutions can influence transformation processes in a way that avoids risks or the socalled dark side of transformation are needed. This article aims to contribute towards understanding the roles that institutions play in transformation processes in the context of Global South food systems through synthesising insights from transdisciplinary case studies. The three case studies include multi-purpose cooperative institutions in farming areas in southwest Ethiopia, fisherfolk organisations in aquatic food-producing areas in northern Philippines, and Gotong Royong for irrigation canal management for pond aquaculture in Indonesia. The article examines whether and how institutions advance inclusion and participation in food systems, and whether institutions enable or constrain food system actors in mitigating or avoiding transformation risks. The paper reflects on the role of community-level institutions and hybrid governance arrangements, and the interplay of structure and agency in transformation processes.

### Introduction

Transforming food systems<sup>1</sup> to realise human health and well-being, while ensuring ecological integrity has become a global priority for research and action (Béné et al. 2019, 2020; Hainzelin et al. 2021). This is particularly urgent in the context of the Global South where many small-scale food producers are confronted with high levels of poverty, food insecurity, malnutrition, disempowerment, and degraded environments (Willett et al. 2019; FAO et al. 2020). The Food and Agriculture Organisation along with other global institutions (FAO et al. 2021) report high levels of food insecurity and malnutrition in Africa and parts of Asia - areas where large fractions of populations rely on food production such as smallholder farming and fishing, and marketing of food for their livelihoods. Presently, the term transformation is broadly discussed in research, policy, and planning, as the systemic change required in various sectors of society including the food sector, to address complex sustainability issues (Bennett et al. 2019; Scoones et al. 2020; Feola et al. 2021). But while the concept of transformation is a relatively new research focus within the broader

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domain of sustainability science, it is by no means a new phenomenon in our collective global history. The unsustainable trajectory that humanity is currently on, is an outcome of transformation processes that were set into motion long before the present generation, but were accelerated during our lifetime (Steffen et al. 2018).

## Food system transformations in the Global South

Whitfield et al. (2021, 383) views food system transformation as 'fundamental changes in circumstance occurring to, for, and by people within... food systems'. Transformation ultimately refers to systemic change which fundamentally shifts system functionality and outcomes resulting in the emergence of a new system or a new regime. In food systems, it is a fundamental change in the structure, function, and relational aspects, that in a normative view, can be oriented towards creating more just social-ecological relationships, interactions, and outcomes (Patterson et al. 2017).

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A historical example of systemic transformation emerges from the Spanish occupation of Jamaica from 1509 to 1655 which transformed the country's food system through integration into the global market (Hardt 2009). Prior to this period, Jamaica had productive reef systems to fall back on when fish availability from near-shore fisheries fluctuated. But transformative globalisation and market integration during the colonial period resulted in degraded nearshore fisheries, decreased availability of seafood for consumption, and looming food insecurity (Dajka et al. 2020). To cite another example, the transformative institutionalisation of La Via Campesina which is a global movement of organised small and middlescale food producers, has shifted numerous farms in different parts of the world towards sustainable agriculture through agroecological practices and food sovereignty principles (Desmarais 2008), considered as the more just and sustainable trajectory over corporate agriculture (Patel 2012; Albertus 2021). Transformations are typically viewed as a gradual process, but some may also manifest in the form of abrupt changes once a system crosses a threshold or tipping point and a cascade of changes occur (Milkoreit et al. 2018).

As the examples highlighted, transformation processes are not neutral (Leeuwis et al. 2021; Whitfield et al. 2021; Davis et al. 2022). They are associated with losses and gains which are often unevenly distributed (Egli et al. 2018; Gurney et al. 2021). In the past, food systems have undergone series of transformations giving rise to different food regimes with evidently mixed outcomes for different actors, including the systematic marginalisation and impoverishment of many smallholder producers through various mechanisms (Patel 2012; Prause et al. 2021). Critical perspectives on the liberalisation of international trade for food in the post-war era which brought about broad changes in food policies shed light on how the transformation which privileged investments to intensify agricultural production and international trade also resulted in decreased access and control over the means of food production. The latter outcomes were more sharply experienced by small-scale producers in the Global South relative to their largescale and richer counterparts. These outcomes were widespread in different parts of Asia and Latin America (Patel 2012). Davis et al. (2022) cautioned against transforming food systems on the backs of the poor which occurs when transformation discourses and interventions de-centre the livelihoods of smallholder producers. Rather, they highlight the necessity of foregrounding inclusion and environmental justice, prioritising livelihood improvement for the rural poor, and making explicit the differences of food systems in externalities generated and in

mitigating them (Davis et al. 2022). Important work by Blythe et al. (2018) calls attention to the dark side of transformation, referring to latent risks in transformation processes and in discourse that frames the process as either inevitable or apolitical.

In view of the current status of poverty, global food insecurity, other forms of unsustainability, and the magnitude of these challenges in many food systems of the Global South,<sup>2</sup> it is not only necessary to understand what drives food system transformations in these contexts and the mechanisms in which these happen (Béné et al. 2019), it is also equally important to critically examine whether and how ongoing or envisioned transformations advance sustainability, equality, and social justice as equally valued goals in transformation processes and outcomes of Global South food systems (Njuki et al. 2016; Whitfield et al. 2021; Davis et al. 2022). Scholars have critiqued top-down and technocratic solutions for their insufficiency in achieving complex societal goals (Scott 2008). Instead, new modes of research are being tested, such as participatory, transdisciplinary research which aims for sustained engagement with multiple actors in framing problems and challenges, co-designing solutions, collaborative implementation of solutions, co-monitoring of impacts, and cocreation of knowledge in an iterative and reflexive manner (Lang et al. 2012; West et al. 2019; Chambers et al. 2022). While research engagement in the topic of transformation particularly, as it relates to transdisciplinarity, has increased (Brandt et al. 2013; Chambers et al. 2021), questions and context-specific evidence around the mechanisms of transformation remains open for examination in most of the Global South (Baumann et al. this issue).

Empirical understandings of how institutions can help influence transformation processes in a way that avoids the so-called dark side of transformation are needed (Blythe et al. 2018). Transformation processes can be influenced by various factors, and institutions are among the powerful factors that can shift the trajectory of complex systems (Meadows 1999; Westley et al. 2011; Abson et al. 2017). Yet the mechanisms through which institutions contribute to transformation are not well understood - especially in the Global South which prompted the Special Issue to which this paper contributes. Distilling insights on the role of institutions in transformation processes and mobilising such knowledge for transdisciplinary work between researchers and societal actors are vital for informing ongoing or future transformative and transdisciplinary interventions.

Our article, therefore, aims to contribute towards understanding the roles that institutions play in transformation processes in the context of Global South food systems through synthesising insights from transdisciplinary case studies in Ethiopia (diversified smallholder farming), the Philippines (aquatic food production), and Indonesia (brackish water pond aquaculture). A multi-country case study approach is adopted in order to analyse differing processes in specific places and to examine the roles of institutions in different contexts. The first objective of this paper is to identify and describe institutions that are important in relation to the transformation of food systems in the selected case studies. For this, we focus on institutions that fostered new social arrangements which can potentially give rise to new practices (e.g. Manlosa et al. 2019a), new social relations (e.g. Cockburn et al. 2020), new ways of working together (e.g. Hakkarainen et al. 2020), or new ways of thinking (e.g. Lotz-Sisitka et al. 2017), among other outcomes that potentially contribute to transformation. Applying a normative lens that is informed by critical perspectives, our second objective is to examine how emerging social dynamics are fostered by the institutions of focus and whether the institutions advance inclusion and participation in food system transformations (Blythe et al. 2018; Davis et al. 2022). This objective focuses on process and is concerned with how institutions can structure whose interests, values, and voices are recognised and valued in transformation processes. Crucially, we argue that it is necessary to have a normative goal in researching and in facilitating food system transformation to understand and actively work towards avoiding risks and negative outcomes, referred to as

the dark side of transformation (Blythe et al. 2018). While it may be challenging for diverse actors with different interests and agenda to collectively subscribe to similar sustainability outcomes, agreeing on what to avoid provides a stable basis for finding common ground and avoiding worst case scenarios within complex governance and institutional landscapes. We therefore adopt the framework developed by Blythe et al. (2018) which conceptualises the dark side of transformation as consisting of shifting of burdens to vulnerable parties, transformation as a justification for business-as-usual, lack of attention to social differentiation, exclusion of the possibility of resistance or non-transformation, and inattention to power and politics (see Table 1 for examples from the Global South). Thus, our third objective is to examine whether and how institutions in the case studies enable or constrain small-scale food system actors in mitigating or avoiding any or a combination of these identified transformation risks.

In the next section, we outline the concept of institutions as they relate to transformation. This is followed by a methods section that provides a brief overview of the cases and data collection. The findings address the objectives in each of the case studies. The discussion returns to the topic of transdisciplinary engagement and offers reflections on how it can be amplified particularly through awareness and careful engagement with institutions in food systems of the Global South. It includes suggestions on key action areas for future research and practice in

Table 1. Risks associated with transformation processes (Blythe et al. 2018) and some examples for food systems in the Global South.

Transformation risks to avoid	Some examples in Global South food systems
Risk 1: Transformation that risks shifting the burden of response onto vulnerable parties	Establishment of protected areas that involves excluding smallholder food producers from accessing resources they rely on for their livelihoods. Promoting adaptation strategies that are costlier for smallholder producers e.g. costly restoration or infrastructure programs.
Risk 2: Transformation that may be used to justify business- as-usual	(see Anaya and Espírito-Santo 2018 for detailed discussion) Unsustainable intensification and industrialisation of food production justified on the basis of food security which reproduces long standing patterns of large scale producers consolidating control while smallholders lose livelihoods, lose control of resources, face decreasing incomes, and face reduced life quality. (see Patel 2012 for detailed discussion)
Risk 3: Transformation that pays insufficient attention to social differentiation	Framing agriculture as one category of production that generates environmental externalities without foregrounding the differences in responsibility between small scale and large scale producers; or highlighting aggregated economic benefits from transformative technological changes (e.g. Green Revolution in the 1970s) without foregrounding how the benefits are disproportionately captured by large scale players while small scale actors lose out. This also plays out when differences across social groups within countries are missed and panacea policies that are not adaptable to local contexts are applied. (see Loos et al. 2014 for detailed discussion)
Risk 4: Transformation that excludes the possibility of non- transformation or resistance	Promotion of costly technologies that intensify food production and digitalisation as 'the' pathway for transforming towards sustainable food systems while not attending to multiple pathways and plural alternatives. (see Prause et al. 2021 for detailed discussion)
Risk 5: Transformation that does not sufficiently engage with issues arising from power and politics	Asymmetric power relations enable rich and influential actors to lobby for greater control over production resources and trading processes, have a stronger voice in legislating policies and setting transformation trajectory in a way that advances their interests rather than prioritising and tackling food insecurity, malnutrition, poverty, and environmental degradation among the most marginalised groups in a population. (see Whitfield et al. 2021 for detailed discussion)

a way that harnesses institutions towards what might be envisioned as a brighter side of transformation.

### Conceptual framework: institutions and their role in transformation

We adopt Scott's (1995) broad definition of institutions as those 'cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour'. These determine an institution's functions, its mechanisms of influence over a system, and its changeability. Some institutions are more regulative in characteristic and function, such as protected areas for conservation which restrict resource extraction, use, and activities in a defined area (e.g. Rifai et al. 2022). Others are more normative such as cultural gender norms which implicitly designate gender roles and shape gendered access and control over resources and decision-making in a food system (e.g. Lawless et al. 2019) with significant impacts on people's abilities to be food secure and nourished. The cognitive element of institutions can be considered akin to Veblen's (1919) settled habits of thought. It is deeply embedded and relates to how both formal and informal rules may be internalised by people to the extent that they shape people's paradigms and worldviews. Institutions are also understood as the socially constructed formal and informal rules that govern and structure humans' interactions and relationships with one another, as well as their interactions with more-thanhumans (e.g. other species, and natural and built environments) (see Jentoft 2004 for various definitions).

Institutions tend to resist change. They are characterised by durability and stability (Jentoft 2004). According to Williamson (2000), different institutions vary in relation to the timescales in which they change. Markets, for instance, change within shorter timescales than embedded cultural norms (Williamson 2000). In cases where institutions underpin unsustainable and inequitable food system outcomes, it is a challenge to transform towards sustainability when institutions lock food systems into a certain state or regime. Restructuring institutions for sustainability can be difficult due to its tendency to be self-reinforcing and change-resistant (Abson et al. 2017). However, such restructuring can be powerful because of institutions' strategic role in guiding humans towards a collective goal and in organising societal interactions (e.g. Abson et al. 2017). Restructuring can occur, for example, through crises that trigger institutional adaptations, purposive destabilisation of unsustainable institutions, building insights around institutional failure that can inform efforts to improve institutional functioning in the future, and the loss or decline of institutions due to broader social changes (Abson et al. 2017; Derwort et al. 2019). Institutions are considered vital for transformation, and institutional change is considered a necessary part in the process of shifting unsustainable and inequitable food systems into alternative and desirable trajectories (Patel 2012; Chappell 2018). Channelling efforts and carefully investing in institutional changes (Westley et al. 2011) that advance process-oriented normative goals (e.g. inclusion, participation, transparency) and proactively working towards mitigating or avoiding the risks associated with transformation processes plays an important role in reversing unsustainability and inequity in many food systems of the Global South.

Different types of institutions exist and exert influence over processes and outcomes of food systems (Table 2). Examples of institutions in food systems include formal rules and regulations, organisations, informal norms, markets, and property rights (Partelow et al. 2022). Rules (of the operational kind) tend to regulate the kind of food production activities that are allowed within a defined area, determine those which are prohibited, and designate who carries responsibility for enforcement (sensu

Table 2. General types of institutions that may influence food systems.

Institutions	Descriptions	Examples
Formal institutions	These are fomally written or codified rules such as laws and regulations, and agreements such as plans and contracts that are collectively and legally binding. Accountability for the enforcement of these institutions is typically the jurisdiction of government. (Abson et al. 2017)	International laws, bi-lateral or multilateral country agreements, national laws, local regulations, legally recognised property rights
Informal institutions	These are collectively held and implicitly learned customs, taboos, codes of conduct, informal conventions, and social norms. They are considered 'the normal way of doing things' which tend to remain unquestioned for centuries. They are also deeply embedded in religion or culture. (Abson et al. 2017)	Customary laws on land access, customary property rights, customary inheritance practices, intersectional gender norms
Hybrid institutional arrangements	Collaborative governance that goes beyond co-existence or competition between governance structures and involves the merging of different types of governance arrangements. Includes reformist and alternative orientations. (Clément 2019)	Collaborative state-community approaches
Organisations	There are varying views on this. Some view organisations as entities that cannot be considered as institutions. Others view organisations as consisting of a bundle of rules which make organisations a type of institution. We adopt the latter view. Organisations may also be formal or informal. (Hodgson 2006)	Community groups, local associations, cooperatives, state organisations, private firms

Gardner and Ostrom 1991). For instance, in the Philippines, small-scale fishing is allowed within 7 km from the shore, while large scale commercial fishing can only be undertaken beyond this space (Manlosa et al. 2021). There are institutions that incentivise production of certain crops, or govern market transactions. Examples of different market middlemen-dominated market institutions are arrangements, community-supported agriculture, and retail supermarket. There are also formal institutions that define property rights. These differentiate between private property, public property, and commonly held resources (Partelow et al. 2022). Additionally, there are institutions that structure cooperation in communities, civil society, and hybrid arrangements in the form of associations which may be formal or informal in character (see Partelow et al. 2022 for detailed explanations of types of institutions). For a complex sector, such as the food sector, institutions of different types with different functions and different characteristics may simultaneously exert influence on the processes and outcomes of food systems (Partelow et al. 2020).

Different factors have been examined by scholars as contributing to the transformative potential of institutions. Focus was given on institutions that enable transformative learning and those that facilitate the creation of new connections and alliances (e.g. Lotz-Sisitka et al. 2017; Cockburn et al. 2020) and empower social groups to the extent that counter-narratives and counter-actions are able to disrupt existing power relations and existing structures (e.g. Chappell 2018). Here, the case studies we selected are all influenced by multiple institutions and a number of papers have been published providing detailed backgrounds on these (e.g. Partelow et al. 2018; Jiren et al. 2021b; Manlosa et al. 2021). For this study, we specifically examine those that demonstrate potential to contribute to and influence transformation processes particularly by creating more inclusive processes and enabling actors to address risks associated with transformation. These in turn, can result in substantive changes in food systems such as changes in who controls and accesses important resources for food system livelihoods, promoting the human agency of those who are marginalised, the creation of new and safe spaces for challenging disadvantageous asymmetric power relationships and structures, promotion of transformative learning, and fostering egalitarian relationships across different axes of social differentiation, among others. As preconditions for these desirable outcomes, and applying the notion of the dark side of transformation (Blythe et al. 2018), in our analyses we paid attention to whether institutions help avoid the shifting of burdens to vulnerable food system actors, avoid using transformation as a justification for business-asusual, remedy the lack of attention to social differentiation of food system actors, reverses exclusion of non-transformation or resistance, or address inattention to power and politics.

### Methods

### **Case studies**

A focus on the Global South is important for understanding the role of institutions in food system transdue formation processes to some shared characteristics including high dependence on food production for people's livelihoods, high importance of community-level initiatives, and histories of marginalisation of small-scale and rural food system actors. In addition, issues related to a lack of clear property rights and capacities for initiating or sustaining collective action in some cases add to the challenge of food system governance. This study examines the role of institutions in transformation processes in three case studies, namely diversified smallholder farming system in southwest Ethiopia, aquatic food production in northern Philippines, and canal management for pond aquaculture in Indonesia (Figure 1, also see Table 3 for transformation trends in the case studies). The inclusion of these case studies was motivated by our interest to examine institutions in diverse food systems and contexts, and uncover key differences and similarities. to Knowledge on the case studies were contributed by different co-authors who undertook field work at different times in the selected areas. Thus, placebased expertise also informed the selection of these cases.

The case study in southwest Ethiopia includes the districts of Seka Chekorsa, Gumay, Setema, and Gera in the Jimma Zone, Oromia Federal State. Ethiopia has a federal government structure consisting of national, regional, zone, district (woredas), and municipality (kebeles) levels. Administratively, Jimma zone is located in Oromia regional state, approximately 350 km southwest of the regional capital, Finfinne. Nearly 90% of inhabitants are smallholder farmers whose livelihoods are highly dependent on diversified farming of food crops including cereals and pulses, production of cash crops mainly coffee (Coffea arabica) and khat (Catha edulis), and some fruits (Manlosa et al. 2019b; Jiren et al. 2022). Although relatively better off than those in other parts of Ethiopia (CSA and WFP 2014), smallholder farmers in the Jimma zone face seasonal food insecurity and structural food system issues (Manlosa et al. 2019b; Jiren et al. 2021a). For instance, formal agricultural development interventions force farmers to use inorganic fertilisers without considering their willingness and



Figure 1. (a) A common view of the landscape in southwestern Ethiopia where the food system largely relies on diversified smallholder farming systems involving the production of various food and cash crops. (b) A small scale fisher in the northern part of the Philippines is unfurling fish nets in an estuary leading to Manila Bay. (c) An irrigation canal along some of the dried brackish water earthen pond aquaculture in Indonesia.

capacity. In some cases, this has led to indebtedness among farmers due to increased production cost without commensurate improvement in earnings (Manlosa et al. 2019c). Some of the key livelihood challenges in the area include environmental degradation, decreasing soil fertility, wild animal crop raids, low agricultural productivity, weak

institutional support, and market problems (Manlosa et al. 2019c; Jiren et al. 2021b). Farmers often rely on formal and informal institutions to overcome food production problems (see Manlosa et al. 2019c; Jiren et al. 2021a). Examples are diddaro, dabo, and dado which are informal, cultural norms of cooperation at the community level. These are long-standing local practices for collaboratively guarding farms from crop raiders or for harvesting crops (see Manlosa et al. 2019c; Jiren et al. 2021a for details). Over the last decade, smallholder-based multi-purpose cooperative institutions (MPCI) have been expanding in the area to promote collective action for a sustainable food system. These cooperative institutions in the food-producing areas often positively contribute to ensuring food security (Zeweld et al. 2015). However, its role in transforming the local food system specifically in the mixed food and cash crops-producing areas still need to be understood.

The case study in northern Philippines is situated in the coastal municipalities of Hagonoy, Paombong, and Malolos. These municipalities are situated in the province of Bulacan, within the region of Central Luzon and along the coast of Manila Bay. Aquatic food production is under the jurisdiction of the Bureau of Fisheries and Aquatic Resources which has offices at the national and regional levels and a satellite station in one of the municipalities studied, and the local government units at the municipality level. Small-scale fishing and aquaculture production are important sources of aquatic food and livelihoods, and these are undertaken in estuarine areas and municipal waters (up to 7 km from the shore) and earthen fish ponds, respectively. Fishers face the challenge of declining fish catch, while aquaculture producers face decreasing productivity of fish ponds and more frequent fish kills (Manlosa et al. 2021). A major environmental problem in the area is water pollution from multiple sources including residential areas, industries, and excessive feed use in large-scale intensive aquaculture. The unregulated overuse of synthetic aquaculture feeds and the lack of water treatment facilities in intensive fish ponds were observed by small-scale aquatic food producers to have caused the decline and disappearance of certain marine aquatic species that are important food sources (Manlosa et al. 2021). Fishers also perceived a substantive increase in plastics in the estuaries and sea. In addition, lack of access to financing, and disadvantageous arrangements in fish markets confront local aquatic food producers. Community-based fisherfolk organisations are, collectively, an important institution that enables small-scale producers to collaborate to address food system challenges (Manlosa et al. 2021).

Table 3. Transformation trends in the case studies.

Case studies	Past or ongoing transformation trends
Diversified smallholder farming in southwest Ethiopia	Increasing orientation towards export of local farming products particularly of the cash crop coffee; increasing adoption of sustainable intensification in the form of organic and mixed-crop farming
Aquatic food production in northern Philippines	Shift from most aquatic food coming from capture fisheries to more aquatic food being produced from aquaculture; past land use change from rice farms to aquaculture ponds due to saline water intrusion; ongoing conversion of land use from aquaculture to residential areas or commercial areas (e.g. airport complex) (Manlosa et al. 2021)
Brackish water pond aquaculture in Indonesia	Shift in land ownership rights leading to remote management of aquaculture ponds Weakening of Gotong Royong cultural norm

The case study in West Nusa Tenggara, Indonesia includes the villages of Lembar and Sekotong in the West Lombok region and the villages of Jerowaru and Sugian in the East Lombok region (Partelow et al. 2018; Senff et al. 2018). Indonesia is one the world's largest aquaculture producers, primarily from brackish (i.e. mixed fresh and salt water) coastal earthen pond production systems irrigated through canal systems. The case study areas produce tiger shrimp, milkfish, crab, snapper, and tilapia from a mix of traditional low intensity to semi-intensive production systems that involve water wheels in lined earthen or concrete ponds. Pond systems are typically situated within deforested mangrove estuaries, and provide subsistence food and small-scale livelihoods serving local and regional markets. A key issue faced by food producers in the area is the management of water supply to fish ponds. Water is delivered through networks of irrigation canals that need to be actively maintained to ensure adequate supply and turnover, often relying on manual water gates, tidal swings, and generator pumps to maintain water flow. Here, we examine how the government sought to revitalise the Gotong Royong, a socio-cultural norm in the Indonesian culture for working together for development in any sector of society. The notion of Gotong Royong in this case is used to catalyse cooperation in irrigation canal management and maintenance for aquaculture. This is explained in greater detail in the findings section.

### Data collection and analysis

Field work for the Ethiopian case study was conducted on February to April 2020, for the Philippine case study on November 2019 to March 2020, and for the Indonesian case study from September 2021 to February 2022. Each coauthor who contributed place-based empirical knowledge for each case study is a native resident of the countries. They conducted the field work in the Afaan Oromoo language in Ethiopia, Tagalog in the Philippines, and Sasak and Bahasa in Indonesia. Field work in the three cases applied a socialecological systems perspective which examined how socially constructed institutional structures shape the use and management of natural resources and attendant outcomes, and how conditions of natural environments influence people's livelihoods and collective governance. The studies integrated transdisciplinarity at different levels but mainly with an orientation to institutional and natural resource management research. For instance, institutional research in the Ethiopian case followed more than 4 years of transdisciplinary engagement to understand food system challenges and to work with scenarios to depict shared goals and explore tensions between different stakeholders' interests. All three case studies involved the collection and analysis of qualitative data around the food system contexts, the ways in which the broader socialecological systems within which food systems are embedded have changed in the past years and are transforming, and how institutions play a role in these processes.

Focus group discussions, participant observations, and analysis of institutional documents (e.g. formal municipality ordinances, national laws, local regulations, reports) were undertaken. Moreover, 40 key informant interviews were conducted with stakeholders who are engaged in food security governance from the kebele up to the zonal levels in Ethiopia, 67 in the Philippines with diverse actors in the aquatic food sector including fishers, aquaculture producers, government representatives, non-government organisations, and market actors, and 111 in Indonesia with aquaculture producers and other stakeholders in aquaculture including community leaders and multilevel government representatives. (Ethics statement can be found at the end of the manuscript.)

Field work for each of the case study generated substantive qualitative data and in-depth place-based knowledge. Qualitative data for each case study was analysed respectively by the co-author who undertook the field work (TSJ for Ethiopia, AOM for the Philippines, and AOP for Indonesia). All co-authors applied a thematic and iterative coding approach in the analysis. The authors first coded qualitative data according to general categories such as descriptions of the food systems, the changes the food systems have undergone, social-ecological challenges, and relevant institutions, among others. For purposes of this paper, the authors then focused on the topic of institutions to reflect on its attributes, processes, and roles in transformation. Authors used the MaxQDA qualitative data analysis software for the analysis.

### **Findings**

This section examines the role of institutions in transformation processes in the three case studies. In each case study, we describe institutions that play a strong role in transformation processes, discuss how institutions influence processes in the food systems, and examine whether and how institutions help avoid transformation risks (Blythe et al. 2018).

## Multi-purpose cooperative institutions in farming areas in southwest Ethiopia

Different institutions operate and interplay in this case study to influence the food system which is highly dependent on diversified smallholder farming. For instance, the public agricultural extension system which is a formal institution, applies an expert-driven top-down approach for the purpose of increasing agricultural productivity (Jiren et al. 2021a). Informal institutions (e.g. diddaro, dabo, dado) which are deeply embedded in culture, aim to help households tide over food shortages by facilitating the sharing of resources particularly labour. These contribute to increased food production, continued access to food, and promotion of social cohesion (Jiren et al. 2021a).

Here, we focus on smallholder-based multipurpose cooperative institutions (MPCI) which are community-level institutions that play a key role in supporting smallholder farming in southwest Ethiopia. MPCIs aim for an inclusive, bottom-up, and voluntary organisation rooted in communities in order to support farmers. The goals of MPCIs in the case study are to increase the production of food (e.g. maize, teff) and cash crops (e.g. coffee), promote sustainable resource management, ensure equitable benefit sharing from food production and marketing, and collectively address food insecurity in ways that go beyond individual capacities. To realise these, MPCIs institutionalise arrangements such as the pooling of labour, finance, and other resources. Among its functions is to facilitate an interface between diverse stakeholders across different governance levels so that actors can interact and stimulate hybrid initiatives. MPCIs bring together multiple actors including local food producers and residents, government representatives, and non-governmental actors. While locals self-organise and manage MPCIs, other actors provide advisory and legal support, market linkages, and capacity building services. These community-level institutions are also connected with other cooperatives in different parts of the country because cooperatives form unions either

at the regional or national level. The higher scale unions then link local cooperatives with regional, national, and international markets. Thus, while the institutions' primary locus of influence is at the community level, they are relevant beyond their immediate communities.

There are a number of mechanisms through which MPCIs influence processes in the food system. The bottom-up characteristic of these institutions facilitates active exchange among its members in identifying the different challenges facing them and in taking concerted action to alleviate the challenges. In this way, members are able to participate in problemsolving and to benefit in the process. For instance, MPCIs provide a platform for collectively identifying where there is farm labour shortage and for codevising labour sharing arrangements. These are concerns that, in the absence of an institution, may be borne individually by farmers, or overlooked at higher levels of governance. MPCIs also encourage alternative ways of farming such as organic and ecofriendly farming. Its openness to the diverse and complex needs of its members has resulted in a multipronged approach to achieving food security to include issues of food availability, increasing incomes, community health, and awareness. While MPCIs facilitate supply of agricultural inputs and seek to promote best farming practices in the area, they also mobilise collective action to expand public infrastructure including irrigation facilities, schools, health centres, and weather and market information centres. As a result, the production and accessibility of diversified food and cash crops have increased in the area. Thus, the MPCIs play an important role in ensuring inclusive processes where voices of smallholder food producers and their contribution to addressing food system challenges are recognised and valued.

However, the gains achieved by MPCIs in promoting inclusion at the community level are limited when higher governance scales are examined. First, there is inadequate interplay and weak collaboration between MPCIs and other local institutions at the district and kebele levels. Mechanisms for collaborative engagement between different institutions functioning in the landscape were missing leading to inadequate functioning of the MPCIs. In addition, the institutional interactions across administration levels were similarly weak, posing a challenge to the cooperatives' operations. While MPCIs achieved livelihood improvements and inclusion for its members to some extent, within a larger scale, its operations were still largely hampered by power capture by elites and government agencies who had bigger capacity in steering food system transformation towards a neoliberal agenda.

There are two ways in which the MPCIs are interacting with the latent risks of transformation. On one hand, as described above, the cooperatives at the community level have not been able to sufficiently engage with, and challenge issues arising from power and politics which are at play beyond the scale of communities. On the other hand, the MPCIs have demonstrated achievements in addressing the role of social differentiation in food system transformation. This was done by organising distributional services to community members. For example, over the last five years, MPCIs in the Gumay and Gera woredas enabled local coffee producers to export their products to European markets. This was further made possible by cooperatives in these districts forming the Arga Union. Similarly, cooperatives in the Seka Chekorsa district exported their products to the Middle East through the help of non-governmental organizations. This was perceived by local stakeholders as playing an important role in increasing income of MPCI members (Shumeta and D'Haese 2018; Jiren et al. 2022). By providing market services, the MPCIs reduced transaction costs and avoided the capturing of benefits by a few private traders. In a market setting where a few purchasers can substantially affect prices, the MPCIs counteracted the likely outcome that local smallholder producers would lose out due to dominant trade arrangements and reduced local people's vulnerability to market and pricerelated risks. Furthermore, MPCIs are supporting nature conservation through organic and ecofriendly agricultural production and ecosystem service management. In this way, it demonstrates an alternative to agricultural intensification and industrialisation that the national government envisions as its desired transformation trajectory. For instance, the forest-based cooperatives, locally known as Wahbub, were instrumental in improving local people's access to ecosystem services while conserving the forest. However, it is worth noting that due to increasing financial returns from cash crops, people have tended to shift their focus towards producing perennial cash crops at the expense of food crop farming. This has the potential to transform agriculture towards greater cash crop production in the long term. However, the role of MPCIs in relation to this food system shift has not yet been adequately observed.

### Fisherfolk organisations in aquatic food producing areas in northern Philippines

Community-based fisherfolk organisations (FOs) are commonly established in aquatic food-producing areas in the Philippines. These organisations fulfil different functions which range from formal functions related to local level rule-making, to informal support to members during times of collective (e.g. pandemic lockdowns) and personal difficulties (e.g. illness). While FOs' functions and activities are guided by the Philippines' national fisheries law (i.e. Fisheries Code of 1998), members of the organisations are also able to collectively set their goals and agenda, and to mobilise to achieve these. The FOs have been present in the study area for a long time, but in the recent years, these organisations have undergone important changes which are emerging to be relevant to food system transformation. Here, we focus on the FO called Nagkakaisang Samahan ng mga Mangingisda ng Paombong (NASAMAPA)/ United Association of Fisherfolks of Paombong. The group is unique in the area because it combines various FOs and provides a platform for collaboration between small-scale fishers and fish farmers.

In general, members of FOs in the case study reported that being part of an organisation helps with having their voices heard. This is primarily because FOs provide a regular platform to discuss concerns of aquatic food producers and a means to communicate these concerns to state actors such as the Bureau of Fisheries and Aquatic Resources. For instance, members are able to identify the kinds of livelihood assistance they require (e.g. fishing boats) and FOs channel this information to government.

NASAMAPA plays a key role in promoting the participation of small scale aquatic food producers in the governance of aquatic food production. A key mechanism through which NASAMAPA promotes inclusion in food system processes in the case study is by bringing together fishers and fish farmers within one organisation and positioning itself as a partner in government initiatives for development. This has given the group legitimacy to be involved in aquatic food development projects beyond what individual FOs have done. It partnered with the government to operate the Community Fish Landing Centre which was initially opened in late 2019. This step gave smallholder aquatic food producers a venue to discuss the challenges they face in relation to marketing of aquatic food where many are locked into disempowering roles as price-takers. Additionally, members of the group were also able to participate in, and actively shape the municipal fisheries ordinance of Paombong which is the municipality's primary regulation for aquatic food production.

Since its establishment, NASAMAPA has evolved to become the NASAMAPA Agri-Coop. It seeks to address the issue of social differentiation in the aquatic food sector. Owing to the dominance of middlemen-centered fish markets at the local level, smallscale producers receive the least benefit from market transactions while profits are concentrated by middlemen. Since 2019, members of the organisation worked closely with the government to access resources that can help them explore alternative market options. By pooling together their resources (e.g. sharing vehicles, labour, and time), organisation members have been able to explore markets in other cities, gain better access to loans for individual fish ponds, apply for government support in the form of storage facilities, and participate in capacity building initiatives. Having evolved into a cooperative, the organisation is gradually challenging the dominant middlemen-centered markets which ignore differentiated advantages and disadvantages by middlemen, traders and smallholder producers. By gradually building individual and collective capacities particularly in fish marketing and more recently fish processing, the organisation is generating mechanisms so that more benefits from aquatic food production can be captured by smallholder producers. As these initiatives have only recently started, how successful these initiatives are in terms of shifting market arrangements to a more equitable trajectory remains to be seen. However, it can be said that the organisation's presence and actions to build capacity and empower smallholder producers in market transactions provide the foundation for a struggle towards more equitable sharing of benefits in future transformations.

### Gotong Royong in small-scale brackish pond aquaculture in Indonesia

Gotong Royong is a collectively held principle as well as an activity that involves joint undertaking of a communal task within a local community (Slikkerveer 2019). It is a cultural norm of cooperation that is expected among community members in Indonesian culture, but one that has been weakening in various parts, over time.

Small-scale brackish pond aquaculture in Indonesia is faced with the challenge of water management, that is, the construction and maintenance of shared irrigation canal infrastructure. The emergence of this challenge traces back to the shift in land ownership rights in the 1980s. During this period, individuals from Mataram, Bali, and Java gained ownership rights over the ponds in West Lombok leading to remote management of ponds, the proliferation of caretakers, and renting by those who used to be land and pond owners. In contrast, ponds in the East Lombok region were still owned and managed by fish farmers. The change in property rights and the resulting demotivation among landless aquaculture farmers particularly in West Lombok, coupled with a lack of awareness about the need for regular canal maintenance (e.g. clearing silt, debris, and waste from surrounding areas) led to the neglect of irrigation canals for aquaculture ponds. Arguably, due to changed social relations in the area and the weakening of Gotong Royong, canal management emerged as an issue that could compromise pond productivity.

In 2013, the government through the Ministry of Marine and Fisheries Affairs sought to address the challenge at the national level by establishing a comanagement scheme for irrigation canals (KKP 2019). A set of technical guidelines and comanagement contracts with budget allocations were established as formal institutions. Under the comanagement scheme, irrigation canals can be collectively managed by reinforcing the Gotong Royong traditional and informal institution of commonality and mutual assistance. The intent was to revitalise Gotong Royong in the aquaculture communities where it was already fading while also addressing the problem of canal management. The villages included in the case study participated in the initiative with the goal of improving traditional pond aquaculture through the repair and regular maintenance of the canals in order to benefit aquaculture production. The government paid wages to aquaculture producers for their labour in maintaining the canals. In addition, the government also sought to promote selfgovernance by introducing a mechanism in which a budget is set that can be used to pay the labour for canal maintenance. Aquaculture producers have the freedom to independently manage the budget and collectively decide which canals need rehabilitation. The program's success was measured based on whether aquaculture producers were still willing to maintain the canals beyond the lifetime of the project and cover areas beyond the limit of the budget.

The outcomes of the effort to formally institutionalise a cultural norm by providing wage incentives differed for the western and eastern parts Lombok. In the eastern part where most people own aquaculture land, there was a higher willingness to continue to manage ponds without wage incentive and to carry this out through the Gotong Royong norm. The challenge is how to institutionalise community-based governance through policy without undermining and crowding out cultural norms through misaligned incentives. This is related to the question of how to build capacity for collective action that supports local governance by leveraging the norms of Gotong Royong through a sense of collective responsibility, shared risk, and agency for self-organising. Furthermore, property rights influence Gotong Royong and needs to be considered in efforts to revitalise it to maintain the shared resources (e.g. canals) among traditional and small-scale aquaculture producers in Lombok.

### Discussion

This article examined the role of institutions in transformation processes in the context of food systems in the Global South. In this section, we unpack the hybrid governance arrangements that were enabled by the existence of these community-level institutions in the case studies, reflect on the interplay between institutional structures and human agency in the context of transformations, consider the opportunities and limitations for influencing transformation processes arising from the scale of institutions, and synthesise implications for transdisciplinary engagements.

## Community-level institutions and hybrid governance arrangements

We found that the existence of institutions, particularly organised groups at the community level facilitated the emergence of hybrid governance arrangements in the form of collaborative statecommunity initiatives. For instance, in Ethiopia, collaborations between multi-purpose cooperative institutions and various actors including government offices, supported local food producers to selforganise to address environmental degradation through the promotion of mixed and organic farming. These collaborations also enabled action to mitigate market inequities by supporting local producers to benefit from coffee export. In the Philippine case, collaborative partnerships between community-based fisherfolk associations, local government units, and the fisheries bureau enabled aquatic food producers to explore opportunities to benefit more from the market in a setting where the power of middlemen is strongly entrenched. In Indonesia, we find the government providing incentives to revitalise the Gotong Royong cultural norm of shared responsibility and shared tasks for canal management. By connecting different institutional actors working across scales of governance, hybrid arrangements helped foster inclusion and participation of local food producers in governance processes, most strongly at the community level.

Hybrid governance arrangements and the choices made within these arrangements are known to lead to both positive and negative justice-related outcomes (Toxopeus et al. 2020) and marginalisation can remain a challenge in such arrangements (Viana et al. 2016). But as our cases demonstrate, community-level institutions can be leveraged as an alternative to individual strategies or top-down strategies in responding to food system challenges. Community institutions helped local food producers find a venue to articulate their concerns, to observe the broader effects of transformation processes not only on their own livelihoods but also on others, and to explore alternative ways of participating or resisting ongoing processes. For instance, cooperatives in Ethiopia are helping producers earn more income (Jiren et al. 2022) by enabling small-scale producers to participate in export. In the Philippines, cooperation between small-scale aquatic food producers and government are enabling the former to explore other market options beside the disadvantageous middlemen-centred fish markets (Manlosa et al. 2021).

For hybrid arrangements to influence transformation processes in a way that promotes inclusion (Davis et al. 2022) and mitigates transformation risks (Blythe et al. 2018), a number of factors was observed to be helpful. First, organised groups of local food producers with a shared collective identity must exist. Developing the capacity to articulate their concerns, set their agenda, mobilise to achieve their goals, and productively partner with other actors particularly the government without their interest being co-opted are needed. These can enable smallscale food producers to navigate collaborative partnerships and the tensions that can arise from such arrangements. Second, key government actors must recognise the legitimacy of community-level institutions and must be willing to invest resources to achieve common goals through collaboration on the basis of egalitarian principles. The absence of one of these factors can significantly stifle the potential of hybrid arrangements as demonstrated by the case in Indonesia where aquaculture producers in west Lombok were less willing to cooperate due to weakening cultural norms of cooperation and changed property rights.

### Structure-agency interplay

In many past and ongoing large-scale transformation processes in food systems of the Global South, smallscale producers are typically excluded in decisionmaking processes leading to negative outcomes such as socio-economic inequities (Patel 2012; Davis et al. 2022). However, within broad-scale transformation processes, distinct and nuanced systemic shifts at the local level may also occur and are important for the future of food systems (Tacoli and Agergaard 2017). Local communities tend to be attuned to the impacts of these shifts through their daily lived experiences in their own livelihoods. Organising as a collective to take action on the impacts can be gradual or quick, but as our findings demonstrate, community-level institutions in the form of cooperatives, associations, and other forms of local groups are important institutions. Thus, transdisciplinary engagement needs to start with understanding the institutions (e.g. formal rules, social norms, hybrid arrangements, organisations) that are already in place and the mechanisms through which these institutions attempt to address food system challenges in their own terms. This can help build understanding around what works, what does not, and to map out which existing social structures can future interventions connect with to co-create a more sustainable and equitable food system.

There are strengths from the community-level institutions we examined that are similar across the contexts we studied. In many cases, these are the institutions that small-scale local food producers are able to participate in most actively because of the relatively smaller or lack of asymmetric power relations among the members (relative to higher scale institutions and actors). For instance, members of fisheries associations in the Philippine case study were neighbours working in the same livelihoods and facing shared challenges although in differentiated ways (e.g. differences between men and women). This facilitates openness in discussions. The embeddedness of community-level institutions in local social relations helps foster agency, accountability, and ownership over initiatives. However, such a dynamic is also embedded in broader social relations (e.g. Manlosa et al. 2021). As multiple scales become involved and asymmetry in power relations increase (e.g. small-scale aquatic food producers and local government representatives) in multi-actor relations, trust and openness may shift and take a longer time to build depending on the histories of those who are interacting. Relatedly, whether community-level institutions function in a bottom-up or topdown manner influences the above-mentioned strengths. The bottom-up institutions in the Ethiopian and Philippine food systems demonstrated better outcomes than the centralised revitalisation of Gotong Royong in Indonesia. In the latter case, a top-down intervention, in combination with altered property rights and weakening norms of cooperation, failed to foster accountability and ownership in canal management.

Community-level institutions of food systems in the study areas exhibit ability to foster and strengthen the agency of local food producers and this is strengthened when they are connected to higher level institutions which can facilitate access to more resources and higher authority. Higher level institutions can thus promote local food producers' agency by creating enabling environments, and providing support for the successful functioning of community-level institutions. However, since higher level institutions also have their own agendas, community actors need to navigate how they take advantage of opportunities as they arise, without being coopted by the interests and means of the higher level actors, and how to ensure harmonious working relations even in the face of differences in priorities or conflicts. Transdisciplinary research can help promote agency of small scale food system actors by fostering opportunities to strengthen existing social connections and to help establish missing ones. Importantly, many communitylevel institutions have already predetermined agenda driven by the actors' own experiences. Transdisciplinary engagement can support this by enabling the articulation of this agenda to higher level governance and ensuring that these are not lost or co-opted. Moreover, community institutions in the case studies are also actively working to address the risks of transformation in response to the challenges they have faced before. The key is to build on these existing efforts and structures.

### Conclusion

Institutions play an important role in transformation processes, particularly in food systems of the Global South. Community or local scale institutions such as multi-purpose cooperative institutions in southwest Ethiopia, fisheries associations in the Philippines, and Gotong Royong in Indonesia are place-based institutions which demonstrate distinctive mechanisms that can potentially promote inclusion and participation, and can enable small-scale food producers to act against transformation risks. These institutions are the primary venues in which food producers, who are not often present in higher level decision-making, are able to articulate and discuss livelihood challenges, explore potential solutions, pool resources, and mobilise for more environmentally friendly and equitable food system practices. While community-level institutions may lack the resources and power to influence food system transformations at a large scale, they also make possible the emergence of hybrid governance formations or collaborative state-community arrangements. Such arrangements provide community-level institutions with access to resources, expertise, wider networks, and political power that they can draw on to co-create and co-implement new initiatives. Some of these initiatives have been helpful in mitigating transformation risks in the case studies, for example, by bringing attention to issues of social differentiation and inequalities. Given the central importance of community institutions in fostering inclusion and foregrounding the needs and solutions to food system challenges, as well as their ubiquity in the Global South, understanding institutions and how they function should be among the first steps in any transdisciplinary engagement. Questions around which institutions are already working towards addressing sustainability challenges and amplifying the benefits, while seeking to understand and change institutions that are reproducing unsustainability needs to be more central in any transdisciplinary engagement whether in the food sector or other sectors. This will require bringing in institutional expertise both in research and practice in transdisciplinary teams.

#### Notes

- 1. Food systems consist of the interconnected activities that encompass the production of food up to its consumption, including the processing, distribution, and marketing of food (Ericksen 2008). Food systems are the broad contexts in which our case studies are embedded, but the analyses focus mostly on conditions related to food production and food marketing.
- 2. Our use of the term Global South is informed by the work of Pereira et al. (2020). We view it as a useful

classification while acknowledging its tensions and limitations. We use it as a broad category to refer to the three countries included in this study. However, we are aware that the term should be used with attention to differentiation in social-ecological contexts and we have taken care to highlight these in our work.

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#### **Disclosure statement**

No potential conflict of interest was reported by the author(s).

#### **Ethics declaration**

All case studies included here underwent a review and were approved by the respective Ethics Committees of Leuphana University Lüneburg and the Leibniz Centre for Tropical Marine Research (ZMT). All case studies obtained the approval of local authorities and were based on the informed consent of all study participants. Prior to each interview or focus group discussion, the authors explained the purpose of the study, asked for informed consent while making clear that participants have the right to decline to answer a question or stop the interview at any time, informed about the mode of recording and how data will be anonymised, and answered any question from the participants. Informed consent was requested and given verbally to appropriately adhere to cultural sensibilities.

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