frontiers | Frontiers in Sustainable Cities

ORIGINAL RESEARCH
published: 16 May 2022
doi: 10.3389/frsc.2022.816649

Peripheralization, Ejidos and Agricultural Livelihoods in Intermediate Mexican Cities: The Importance of Collective Agency to Reduce Vulnerabilities

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OPEN ACCESS

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Specialty section:
This article was submitted to Innovation and Governance, a section of the journal Frontiers in Sustainable Cities

Received: *16 November 2021*
Accepted: *07 April 2022*
Published: *16 May 2022*

Citation:
Méndez-Lemus Y, Vieyra A, Poncela L, de la Tejera B and Ruiz-López C (2022) Peripheralization, Ejidos and Agricultural Livelihoods in Intermediate Mexican Cities: The Importance of Collective Agency to Reduce Vulnerabilities. Front. Sustain. Cities 4:816649. doi: 10.3389/frsc.2022.816649

This paper focuses on the interactions between peripheralization, vulnerabilities of agricultural livelihoods, and local collective agency in the creation of new capabilities in intermediate cities. It discusses the theoretical implications of a study conducted in the municipality of Tarímbaro, part of the intermediate city of Morelia, Mexico; it expands on results already published in preliminary form. The unit of analysis was the ejido, since this type of social land tenure, granted to landless peasants in 1917 after the Mexican Revolution, is one of the most important forms of social organization in rural Mexico. About one-half of the Mexican territory comprises >30,000 community-based land tenures (mainly ejidos), and a high proportion of the land now occupied by urban centers was ejido land. This paper uses the example of 15 ejidos, notably affected by the expansion of Morelia city, to illustrate how local (rural) organizations can foster collective agency to reduce differential vulnerabilities in peri-urban agricultural livelihoods in intermediate cities. In 2015, a semi-structured interview was undertaken with the president of each ejido, followed by a survey of 61 individuals from 11 of the 15 ejidos. The peripheralization of Morelia has produced inequalities in the adjacent municipality of Tarímbaro. Differential vulnerabilities in peri-urban agricultural livelihoods were found in the participant ejidos. Not all the ejidos have been successful in addressing vulnerabilities associated with urbanization of agricultural land, but those who have achieved some success have certain characteristics that reinforce common values and motivations to establish common goals to sustain local livelihoods. This paper highlights the importance of functional (rural) organizations in regulating access to, and distribution of, resources in the peripheries of intermediate cities.

Keywords: peripheralization, peri-urban agriculture, peri-urban agricultural livelihoods, differential vulnerabilities, collective agency, collective capabilities, social capital, intermediate Mexican cities

INTRODUCTION

Neoliberal urbanization has serious implications for poverty and inequality in Latin America. New patterns of population growth and expansion have created heterogeneous and unequal geographies, not only in large cities but also in medium-sized and small ones (Cohen, 2004; Da Gama, 2011; Roberts, 2014; Cruz and Jiménez, 2019). In this context, intermediate cities[1] have become important within Latin American urban systems, not only in demographic and economic terms but also in functional matters since they are seen as nodes that connect local and global regions (Cohen, 2004; Carrión, 2013). In fact, they have been recognized as important for regional development and poverty reduction, since they are supposed to be well-integrated with their rural hinterlands, and thus may offer better living conditions (in terms of jobs, services, infrastructure, markets, etc.) to the urban, rural and regional population than do megacities (Borsdorf, 2003; Bolay and Rabinovich, 2004; Rojas et al., 2013; Llop et al., 2019). Nevertheless, Latin American intermediate cities are surrounded by heterogeneous, marginal, disarticulated, and unplanned territories, which are largely associated with poverty and inequality, and also with territorial traps that make livelihoods of disadvantaged groups highly vulnerable (Méndez-Lemus et al., 2017; Da Gama, 2011; Hernández-Guerrero et al., 2012; Ruiz-López et al., 2022).

Peripheral urbanization or peripheralization often refers to the dispersed growth encroaching over agricultural land, forested areas, rivers, and villages around cities. It focuses on the geographical location determined by the distance from the center (fringe, margins, border, edges, outskirts, peri-urban, etc.). But peripheralization is also a concept used in central and eastern Europe and more recently in Asia and Latin America to explore spatial differentiation at diverse geographical scales (Fischer-Tahir and Naumann, 2013; Caldeira, 2017; Janoschka and Salinas, 2017). With the increase of socio-spatial inequalities in recent decades, peripheralization has been associated with particular forms of production of space (through unequal social power relationships) that generate and/or perpetuate uneven geographies, not only in spatial and material terms, but also in social, economic, political and environmental aspects which compromise the wellbeing and the livelihoods of disadvantaged people (Bern and Colin, 2013; Caldeira, 2017; Gerundo et al., 2020). In this context, peripheralization focuses on the unequal processes through which peripheral spaces emerge and are shaped as deprived areas. These areas can be in any part of a neighborhood, rural area, city, metropolitan region, marginalized space, or country (Fischer-Tahir and Naumann, 2013; Kühn, 2015; Barletta et al., 2020; Gerundo et al., 2020).

For this study, both approaches are relevant, since in Latin America most urban growth is taking place in the rural areas surrounding small and intermediate cities without comprehensive urban/regional development policies (HABITAT and DFID, 2002; UNFPA, 2007; Da Gama, 2011; McGranahan and Satterthwaite, 2014). This peripheral growth is producing and reinforcing uneven geographies where deprived areas are characterized mainly by limited access to infrastructure and services (which include clean water, functional sewerage, paved streets, night-time lighting, schools, health care, etc.) and by food insecurity, overcrowding, unreliable and expensive transport, loss and/or transmutation of (rural) livelihoods, precarious jobs (informal and insecure, low incomes, absence of social benefits, etc.), social exclusion, and exposure to social and biophysical hazards (HABITAT and DFID, 2002; Méndez-Lemus, 2007; Cruz and Jiménez, 2019).

As in the rest of Latin America, the 22 intermediate cities[2] in Mexico have been extremely dynamic in the past three decades to the point that all of them have become metropolitan zones, where almost 20% of the total urban population of Mexico reside (about 17 million people) (SEDATU and CONAPO, 2018). This growth and expansion have been encouraged by the movement of population from larger metropolitan zones (including the Metropolitan Zone of the Valley of Mexico) and the implementation of neoliberal policies that favored investments from the real estate sector in the periphery of intermediate cities because they had territorial reserves and conditions to expand real estate markets (Sobrino, 2003).

Although these metropolitan zones differ widely, they have in common their unequal, intensive, disordered, discontinuous and disperse peripheral growth (Aguilar and Vázquez, 2000; Pérez, 2006; Da Gama, 2011). They have experienced dramatic changes in their growth and expansion patterns to accommodate the demands of the global economy, widening structural inequalities, particularly in their peripheries (Ziccardi, 2016, 2019; Alvarez de la Torre, 2017; Aguilar and Lopez, 2018; González and Larralde, 2018; Cruz and Jiménez, 2019). In the case of intermediate cities, urban peripheries often belong to different municipal jurisdictions that have higher marginality and poverty rates than their city center (CONAPO, 2010, 2015). Also, many of them expand over the most important agricultural land reserve, affecting mainly productive land and agricultural livelihoods. The most intensive urban expansion over agricultural land in recent years has occurred in the states of Jalisco, Michoacán, México, Oaxaca, and Puebla (Martínez and Monroy-Ortiz, 2009). A high proportion of this land is *ejido*.[3]

People in peri-urban areas have diverse backgrounds and, hence, different modes of life; *ejidatarios* (ejido owners), who depend to some extent on small-scale agricultural livelihoods, might experience a greater loss of resources and a greater impact on their livelihoods than do other residents. This

[1]Intermediate cities are (depending upon the country in which they located), defined not only by their population size and built surface area, but also by their ability to integrate urbanised and adjacent rural areas or small cities (Bolay and Rabinovich, 2004; Llop et al., 2019).

[2]Mexico is predominantly urban, with 81% of the total population living in 401 cities (SEDATU and CONAPO, 2018). In Mexico, cities with between 500,000 and 999,999 inhabitants are classed as intermediate.

[3]The ejido is a type of social land tenure that was granted to the landless peasants in 1917 after the Mexican Revolution (about one-half of Mexican territory comprises >30,000 community-based land tenures, mainly ejidos). It is considered to be one of the most important forms of social organization in rural Mexico. Michoacán is the state with the third-highest number of ejidos in the country (after Chiapas and Veracruz) (Morett-Sánchez and Cosío-Ruiz, 2017).

is because peripheralization creates a complex framework of intertwined new and old deep-rooted (rural) disadvantages for them, such as poor soil fertility, loss of agricultural land, contamination and depletion of water sources, low income, low educational qualifications, old age, speculative pressures, and cash dependency. This forces the transmutation of their livelihoods[4] in highly unfavorable conditions (Méndez-Lemus and Vieyra, 2017). In the context of "livelihoods peripheralization," the need to achieve common goals (collective agency), and to acquire collective capabilities to reinforce the endeavors and endurance of agricultural livelihoods, led to unusual but necessary coordination and cooperation to influence emergent social structures in the periphery of cities (Ibrahim, 2006; Méndez-Lemus et al., 2017). This aspect of urban-rural transitions is particularly important to intermediate cities, not merely to "facilitate" rural-urban integration, but also to exercise the rights and secure valuable resources upon which local livelihoods depend; this should reduce further inequalities and vulnerabilities in the local populations around cities, since the pursuance of common goals might enable people to negotiate more forcibly whatever is important to their lives. Lessons from other ejidos have shown that emphasis on collective gains rather than individual interest can reduce land speculation as well as implement "vernacular" regulations in land transactions according to their own values and interests (Torres-Mazuera, 2012). In Latin American countries, organized local population can have more influence in the territorial governance of peri-urban areas (Zucchetti and Lariviere, 2005; Ubilla-Bravo, 2020). In contrast, when individual interests and conflicts predominate within an ejido, disadvantageous land transactions can occur and land privatization as well as uneven territorial transformations press forward with limited resistance (Torres-Mazuera, 2009; Villaseñor et al., 2019).

This paper illustrates how collective agency is fostered inside peri-urban ejidos to reduce some of the livelihood vulnerabilities created/exacerbated by peripheralization. We use the evidence of 15 peri-urban ejidos located in the municipality of Tarímbaro (either in or adjacent to the conurbation Morelia-Tarímbaro). Morelia, the capital of Michoacán state, is an intermediate city whose relatively recent unplanned expansion encroached upon agricultural ejido land in Tarímbaro.

This paper is a good example of the adaptation but also the resistance of local communities to the peripheralization of social land around intermediate cities in Mexico. It also brings to the fore the importance of collective agency in the acquisition of social capabilities to reduce differential vulnerabilities and further inequalities in peri-urban areas. Our findings will contribute to a scarce literature of peripheralization of rural spaces and local livelihoods around intermediate cities in Latin America.

[4]This implies the transformation (from rural to urban) of the original local livelihoods (assets, strategies, and ends) and the redefinition of the constituting relationships and spatial arrangements in a particular territory (Zanon, 2011; Méndez-Lemus and Vieyra, 2014).

URBANIZATION OF EJIDO LAND

The ejido is not only a form of social land tenure but is also the most important form of social organization in rural Mexico. Until 1991, ejido land could not be sold, rented, or mortgaged; yet it was the major source of illegal land supply for low-income housing (Azuela, 1989). Since its creation, the ejido had been assigned (formally and informally) economic, administrative, and political functions. Therefore, it operated as a unit of the municipality to manage public financial and productive resources for the agricultural sector. It also regulated other aspects of rural community life such as infrastructure provision and distribution. In fact, the ejido was the basic core of economic organization in rural areas, and the main beneficiary of rural and agricultural development plans. But most of all, it was the interlocutor of State action and a fundamental support of the government's corporatism (Carton de Grammont, 1995; Torres-Mazuera, 2009).

Nevertheless, with the neoliberal reforms to Article 27 of the Constitution in 1994 and to the Agrarian Law and relevant Agrarian Regulations in 1992, major changes occurred within the ejido. For instance, its economic and political functions weakened with the creation of new and more efficient social structures, such as numerous local organizations as well as productive organizations oriented toward the agricultural sector and the action of political parties (Carton de Grammont, 1995). The new legislation granted ejidatarios the ability to convert their "use" rights into "individual" rights to legally sell, rent, or mortgage their land to non-ejido members, even for urbanization. Therefore, through a long and complex process to disestablish the ejido, the ejidatarios can obtain *dominio pleno* (freehold possession),[5] to sell their land (parcels and common area) to outsiders. *Comisariados ejidales*[6] have been instrumental in facilitating (or not) land sales around cities (Jones and Ward, 1998; Pola et al., 2017; Tellman et al., 2021); they have conducted (or eased) land sales, helped speed the paperwork through the Agrarian Reform Ministry to sell plots, gained assistance for plot layout and looked for advice on price settings.

These reforms were seen as the federal response to the illegal alienation of the ejido and as a mechanism to speed land tenure regularization for legal urban developments (Jones and Ward, 1998; Pola et al., 2017). Other authors emphasized, however, that these reforms also sought to advance the modernization of the countryside by injecting substantial private capital to increase production, to develop technologies and to

[5]The first step for *ejido* land to convert into private property was the voluntary participation in the nationwide Land Certification Program (PROCEDE) to grant certificates of ejido rights to individual ejidatarios. San Pedro de los Sauces, one of the ejidos included in this study, was one the first ejidos in Mexico to obtain its certificates in 1994.

[6]The Comisariado ejidal (ejidal commissariat) is the representative and executive authority of the ejido. It is elected every three years by the Assembly (members of the ejido or ejidatarios), and is the highest legal body of the ejido responsible for the execution of decisions regarding funds, harvest, titling, etc. The ejidal commissariat comprises a president, a secretary and a treasurer.

reorientate production toward external markets (Chacón, 1994; Kay, 2016).

In 2006, 93% of all ejidos in Mexico participated in the programme and obtained certificates for individual plots. However, land conversion into private property has not been as widespread as expected (Haenn, 2006; Barnes, 2009). In 2017, no more than 20% of ejidos decided to endorse their dominio pleno, and only a modest proportion of their holdings (by area) was transferred to private ownership (Varley and Salazar, 2021). This seems to be related to a series of irregularities associated with law compliance, local customs, collective practices, and individual interests that were activated by the reforms to Article 27 (Torres-Mazuera, 2015).

Ejidos in metropolitan zones have tended to claim their dominio pleno almost 3.5 times more than the national average (Salazar, 2009), but informal urbanization of ejido land in the periphery of cities still dominates (Tellman et al., 2021; Varley and Salazar, 2021). In Mexico City, for instance, urbanization of ejido land is up to three times more likely to be informal than formal (Varley and Salazar, 2021). In Michoacán, one of our key interviewees from the Procuraduría Agraria estimated that for each legal ejido land sale there are two or three illegal land transactions. In Mexico City, Tellman et al. (2021) found that ejidatarios preferred illegal land transactions in order to avoid the high individual transaction cost following from disestablishment of the ejido.

Whether legal or illegal, urban expansion in Mexico has alienated peri-urban ejidos (the land, the people and their livelihoods) and subordinated them to urban logics of capital accumulation, thereby provoking significant social and territorial changes in the periphery of cities (Napoletano et al., 2019).

FOSTERING COLLECTIVE AGENCY ON THE PERIPHERY OF CITIES: THE ROLE OF SOCIAL ENGAGEMENT, TRUST AND RECIPROCITY

Collective agency refers to the capacity of a group to define and pursue common goals according to their values, interests and/or needs (Pelenc et al., 2015). In the context of this paper, collective agency is important, not only to achieve a livelihood through agriculture; it also confers collective capabilities to manage the geographical endowments of peri-urban ejidos to reduce vulnerabilities created by peripheralization as well as to shape and pursue an individual's perceptions of the good. While collective agency cannot be imposed, it is not spontaneous either. In fact, the ability to define common goals and act collectively in accordance with these has to be learnt and fostered. Collective agency is related to communal values, social structures, and repeated interactions with people who pursue shared interests (Ibrahim, 2006; Pelenc et al., 2015). It implies the capacity to achieve goals that are beyond self-objectives, and for that reason it requires social capital to function (Ibrahim, 2006). Social capital is defined as networks of social relationships based on formal and informal norms and rules, but also values and beliefs that promote trust and make possible the reciprocal exchange of meaningful resources (including information and knowledge) (Granovetter, 1973; Putnam, 1995; Burt, 2000; Woolcock and Narayan, 2000; Bebbington, 2003). It is not only how resources are exchanged within a network that attracts our attention to social capital but also the social interaction (formal and informal feedback loops of social engagement, generalized trust and continuous reciprocity) that promotes cooperation and coordination amongst those involved in the pursuit of shared goals.

There is a degree of skepticism about the extent to which social capital can foster individual and/or collective capacities of disadvantaged people to exercise collective agency and vice versa. Cleaver (2005) argues that mainstream understanding of the link between social capital and livelihoods does not consider the limitations of the poor in exercising individual agency. Nor does it consider how such constraint jeopardizes their capacity to strategically engage in social networks, and, when they do, they are less able to negotiate and influence others' perspectives. Without denying these limitations, we believe that analysis of how collective agency is fostered from the social capital perspective in peri-urban ejidos could be more productive when we consider the following two aspects: the extent to which the pre-existing social (rural) structure and social interaction generate positive expectations about others (generalized trust); and how these help to create spaces of collective learning as well as opportunities for coordinated action to create collective capabilities for collective gains to reduce certain aspects of livelihood vulnerabilities (Ibrahim, 2006; Gubbins and Maccurtain, 2008; Kramer, 2010; Méndez-Lemus and Vieyra, 2017).

As mentioned above, social interaction is crucial in the construction of collective agency. Interaction gives information about others' intentions, dispositions, and expectations (Kramer, 2010). Also, interaction fosters the exchange of perceptions and visions in groups with similar goals (Ibrahim, 2006). Group meetings, community reunions, and informal conversations are examples of opportunities to foster social interaction and social learning (Ibrahim, 2006; Pelenc et al., 2015). People interact (and engage in networks) when they share similar interests, understandings and flexibility to follow certain rules and regulations through formal and informal, institutional and non-institutional arrangements (North, 1994). According to Helmke and Levitsky (2004), formal institutions are the formal aspects of the conditions that people accept to guide their behaviors (such as laws, rules, clear sanctions, procedures, and precedents). Formal institutions are created, publicly communicated, and enforced through official channels, and they are important in guaranteeing predictable conditions and in granting certainty for all involved, including disadvantaged groups. Informal institutions, on the other hand, are shared expectations that include "socially shared rules, usually unwritten, that are created, communicated and enforced outside the officially sanctioned channels" (Helmke and Levitsky, 2004, p. 727), such as community norms or norms of civil society, and self-imposed codes of conduct (North, 1994; Robison and Flora, 2003).

When formal institutions are incomplete or ineffective in practice, society creates informal ones. These may be the second choice for actors, simply if they cannot achieve a formal institutional solution because they lack the power to change the formal rules. Empirical evidence has proved that when informal institutions are functional, they can provide real opportunities for social change (Helmke and Levitsky, 2004; High et al., 2005). Nonetheless, informal institutions also emerge when people are trying to pursue certain goals that are not publicly acceptable (Lomnitz, 1988; Brinkerhoff and Goldsmith, 2002; Helmke and Levitsky, 2004). Therefore, in the context of peripheralization, particular attention should be paid to informal institutions, since they can shape the performance and outcomes of the formal ones (particularly weak formal institutions) in important and unexpected ways for the benefit (or detriment) of the disadvantaged groups (Lomnitz, 1988; Brinkerhoff and Goldsmith, 2002; Helmke and Levitsky, 2004; High et al., 2005). Informal institutions differ from other behavioral determinants such as emotions, values and beliefs (e.g., empathy, sympathy, solidarity, caring, and regard) (Schmid, 2000; Robison and Flora, 2003; Adler and Kwon, 2009). In contrast to informal institutions, those patterned behaviors are not rule-bound in shared expectations about others' behaviors. The context in which a behavioral regularity is carried on (e.g., reciprocity, solidarity, etc.) is essential if it is to be considered as an informal institution. As a rule of thumb, if a behavioral regularity responds to an established rule or guideline, and its violation generates external sanction, then it is an informal institution (Helmke and Levitsky, 2004).

Based on individual capabilities to follow certain rules, norms and values, people can reciprocate in sharing (formally and informally) not only material goods embedded in the network, but also ideas, knowledge, information, services, time, etc. Continuous feed-back loops of engagement and reciprocal exchange promote higher levels of generalized trust and reciprocity. This is because people perceive reassuring factors that give them positive expectations about others which facilitate positive behaviors. Groups relying on ongoing engagement, generalized trust and reciprocity tend to promote

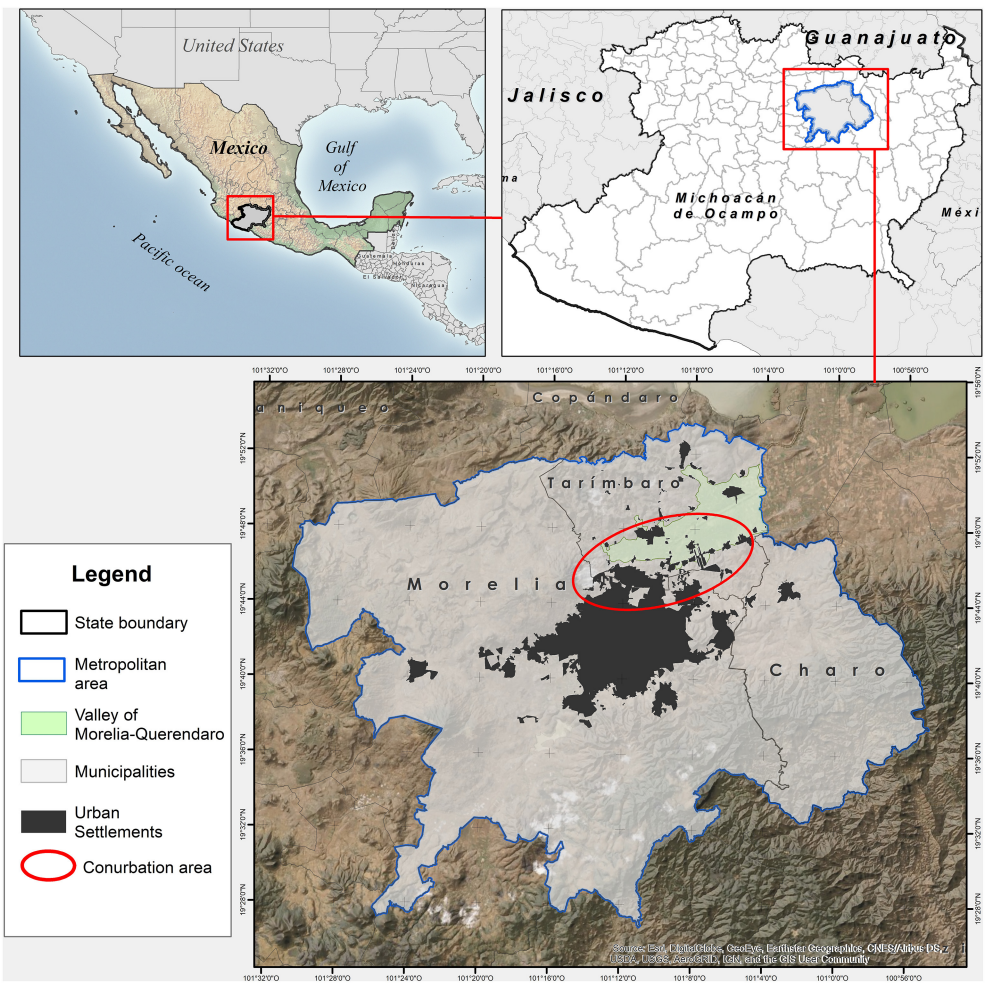

FIGURE 1 | Metropolitan zone of Morelia.

collective learning environments, where individuals not only share information and learn from each other but also recognize mutual interdependence and, therefore, internalize the importance of collaboration and coordination for the common good. In this endeavor, they acquire collective (or social) capabilities to reduce vulnerabilities (Rothstein, 2000; Echebarría, 2001; Ibrahim, 2006; Gubbins and Maccurtain, 2008; Kramer, 2010; Agneessens and Wittek, 2012; Huppé and Creech, 2012; Méndez-Lemus et al., 2017). Capabilities of this type can only be achieved socially and are important because they surpass individual self-interest and have the potential to benefit the group (Ibrahim, 2006; Thapa et al., 2012).

PERIPHERALIZATION OF EJIDO LAND IN THE CONURBATION MORELIA-TARÍMBARO

Morelia is the largest city in Michoacán, with the largest population. Because of its economic and commercial dynamism and tourism activities, Morelia is one of the most important cities at regional level and the most important at the state level (**Figure 1**).

As with other intermediate cities, its population increased considerably during the past 40 years, from 353,055 in 1980, to 849,053 in 2020 (SEDATU and CONAPO, 2018; INEGI, 2020). The urbanized area increased even more significantly (from

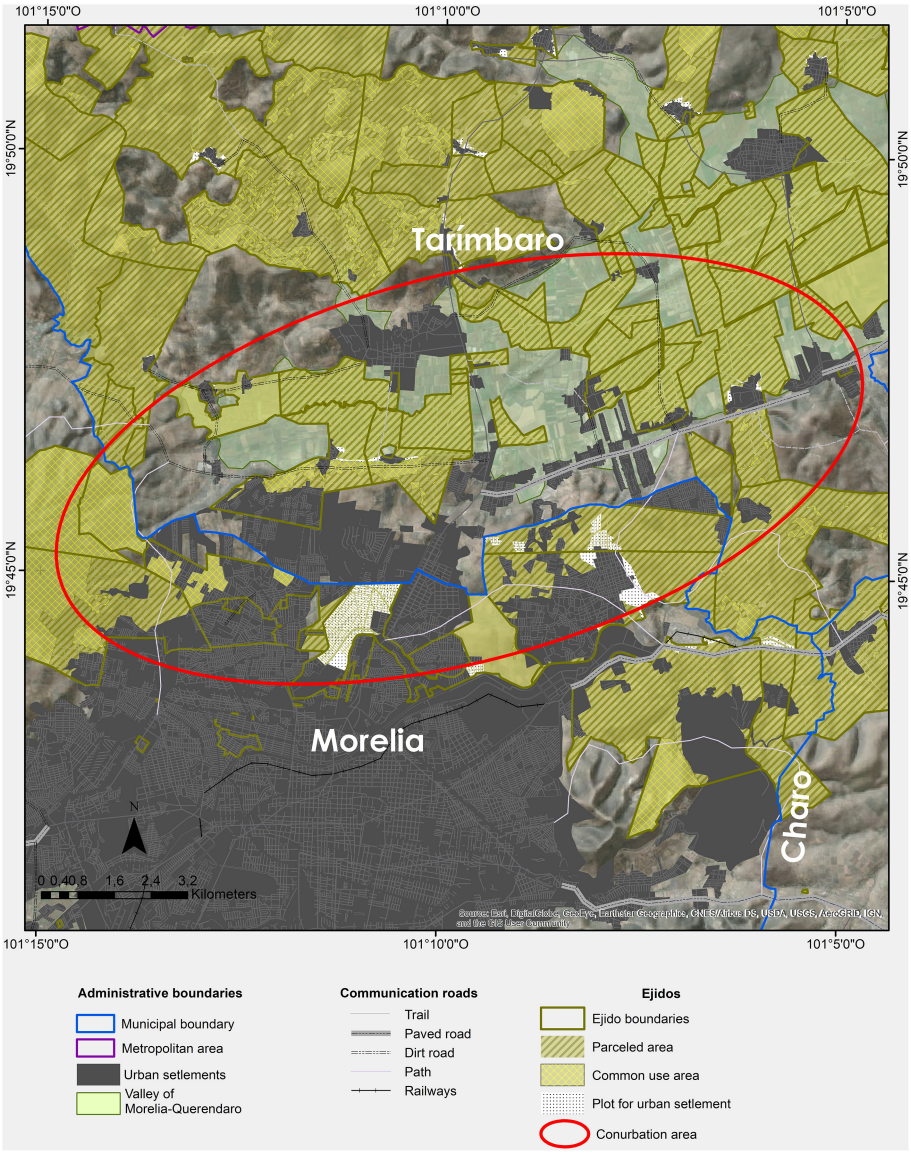

FIGURE 2 | Morelia-Tarímbaro conurbation.

26.47 km^2 in 1980 to 234 km^2 in 2015) (Lemoine, 2015; UN-HABITAT, 2016). With the lack of available space in the city center, the low cost of agricultural land on the fringe of the city (*ejido* but also private land) to the north, and the absence of comprehensive urban planning and land regulations, Morelia experienced its most chaotic peripheral expansion between 1990 and 2000, trespassing across the jurisdictional boundaries of the contiguous municipality of Tarímbaro (CONAPO et al., 2007; Larrazábal et al., 2014; Poncela et al., 2015). This peripheral urbanization was to become not only the conurbation that originated the Metropolitan Zone of Morelia (MZM), but also the most dynamic conurbation in the whole MZM for the past 20 years.

Consequently, until 2000, Tarímbaro's population grew steadily (by an average of 3.7% annually). However, from 2000 to 2010, this growth increased considerably (6.13% between 2000 and 2005, and 10.55% between 2005 and 2010) but the average annual rate of increase in dwellings was almost twice that of the population growth in the same period (15.3%) (UN-HABITAT, 2016). From 2000 to 2020, the population roughly tripled (from 39,408 to 114,513 inhabitants), while the urbanized land extended even more rapidly, by about 3.6 times in only 15 years (from 11.6 km^2 in 2000 to 42.4 km^2 in 2015) (INEGI, 2000, 2010; Ayuntamiento de Tarímbaro, 2013; UN-HABITAT, 2016). Around one-half of the population resides in the southern part of the municipality, either in or near the Morelia-Tarímbaro conurbation. This conurbation is expanding over the Morelia-Queréndaro valley, one of the most fertile irrigated agricultural districts in the whole of Michoacán state, as well as one of the most important food production areas for local and regional markets (**Figure 2**) (PEMEX, 2010).

The peripheralization of the southern part of Tarímbaro brought new inequalities and vulnerabilities for old and new inhabitants alike. For instance, massive formal and informal transactions that converted unserviced agricultural land into urban areas were not only permitted but even encouraged. While this kind of transactions attracted mostly private urban developers; they represented great business opportunities for corrupt local leaders, urban developers, political organizations, public sector workers, and authorities at local and state level (Ayuntamiento de Tarímbaro, 2013, 2014; Méndez-Lemus and Vieyra, 2015).

In this process, ejido land (and private property) was mainly converted into middle- and lower-middle-income residential developments (*fraccionamientos*) as well as low-income informal settlements. Most of them (about 80%) have not been formally registered with the municipality to guarantee conservation and maintenance of infrastructure and services. In fact, a quantitative and qualitative shortfall of urban infrastructure and services (including security) for the growing new population in the conurbation area has been a major concern for the municipality, which is compelled to invest more resources; this intensifies the imbalance in the access and distribution of resources between rural and urban areas of the municipality.[7] Some commercial and industrial activities, as well as a few small agricultural production enterprises, have established their premises in the Morelia-Tarímbaro conurbation; in the landscape, imbrications of *fraccionamientos*, informal settlements and vacant land (once ejidos) over small villages and irrigated plots are common (**Figure 3**).

FIGURE 3 | Morelia-Tarímbaro conurbation landscape.

A precarious labor market is another example of vulnerability created by peripheralization.[8] Between 2000 and 2010, engagement in tertiary economic activities increased significantly in absolute and relative terms (from 39.4 to 75%), concomitantly with a decrease in those working in secondary activities (from 27.3 to 19%), and primary activities (from 33.3 to 6%). Nevertheless, a high proportion of these "new jobs" in tertiary activities are precarious (temporary, informal, low remuneration, lack of social benefits, etc.) and are within Morelia city rather than in Tarímbaro. This has provoked hardship among local families because many of those whose workplace is outside Tarímbaro must travel long distances every day and spend a high proportion of their wages on transport. For some families, income is insufficient to meet their basic needs, so they must withdraw their children from school to reduce expenses and/or to send them to embark on precarious/dangerous jobs (CONAPO, 2010; Ayuntamiento de Tarímbaro, 2014; Polis, 2014). At the same time, social problems among young people such as alcohol abuse, drug use, early pregnancy, and school dropout have increased in recent years.

[7]Not until 2014 was a new Municipal Urban Development Program launched as an attempt to (a) consolidate the existing housing developments and inhibit the development of new constructions; (b) protect the agricultural land and agricultural livelihoods in the valley; and (c) improve urban infrastructure, roads, transport, sanitation and waste management mainly in the Morelia-Tarímbaro conurbation (Ayuntamiento de Tarímbaro, 2013). In 2017, this became the Municipal Program for Territorial Planning and Sustainable Urban Development of Tarímbaro; in some ways, it removed the protection that had been stipulated in the 2014 program (Ayuntamiento de Tarímbaro, 2017) and permitted new urban settlements in the valley.

[8]In fact, in 2015, Tarimbaro had a 0.41 Gini index, one of the highest in the state of Michoacán (UN-HABITAT, 2016).

METHODS

The data for this paper were obtained from 15 ejidos whose productive plots were located partially or totally in the Morelia-Querendaro valley (**Figure 4**). Each was selected because it had been notably affected by the expansion of Morelia city. At the moment of data collection, all 15 depended almost entirely on agriculture and hence were highly dependent on natural resources (soil and water) to make a living; most had no additional off-farm income or jobs **Appendix 1** (in **Supplementary Material**).

To understand how collective action is fostered through social capital within the peri-urban ejidos, we used data from two sources. First, semi-structured interviews between February and March 2015 focused on the Comisariado ejidal (specifically the president); the Comisariado has the power and obligation to organize Assemblies, to implement sanctions, and to administrate the ejido's endowments and financial resources (Ley Agraria, 1992). Each ejidal president was asked about the social structure inside his own ejido, and about features of social interaction, collective learning and collective benefits. To reinforce/complement these more general views with individual perspectives, 61 ejidatarios from 11 of the 15 ejidos were interviewed between June and September 2015; the remaining four ejidos could not be represented in this part, since those four did not hold an Assembly during those months.

Ejidatarios were selected through the opportunity sampling approach (non-random) based on their positive response to an invitation to participate in the survey after their Assembly. The number selected from each ejido varied between 3 and 9 **Appendix 2** (in **Supplementary Material**). To be aware of the differential vulnerabilities created by peripheralization, each participant was asked about his perception regarding land sales and the effects of urbanization in his community and on his agriculture-based livelihoods. **Table 1** provides more detailed information of the data used to understand how collective agency is fostered within peri-urban ejidos from a social capital perspective to reduce some of the vulnerabilities created (or exacerbated) by peripheralization.

In questions regarding social interaction and collective learning (**Table 1**) we provided all respondents with a card to choose one of the following options in each question: Always, almost always, hardly ever and never. The collective capabilities obtained from collective agency to reduce some of the (differential) vulnerabilities were registered through open questions.

Quantitative data from the survey were analyzed through Excel to obtain basic descriptive statistics. Not all ejidatarios responded to all questions, and this restricted the availability of responses in the social interaction section, thereby creating variation in the number of respondents for any one question. Qualitative data from semi-structured interviews and open questions from the survey were explored through the constant comparative method. Information obtained was triangulated.

RESULTS AND DISCUSSION

Peripheralization and Differential Vulnerabilities in Ejidal Agricultural Livelihoods

In the context of peripheralization of ejido land, small-scale agriculture remains the most important economic activity of the municipality, not only because of the total area of Tarímbaro devoted to this activity (over 50%) (INEGI, 2015), but also because of its profound influence on the daily life of local and regional residents. It establishes short supply chains of fresh and affordable food for families. Under these circumstances, ejidal (peri-urban) agriculture within the Morelia-Queréndaro valley has multiple functions, and its significant role in the livelihoods of local people mitigates to some extent the drawbacks of peripheralization. It can generate jobs and income for (unemployed) young residents and new settlers (Méndez-Lemus, 2007; Ayuntamiento de Tarímbaro, 2014). According to Castro (2020) and Chávez (2020), these functions have continued in the period that has followed our data collection. Additionally, those authors found that this type of agriculture can contribute to biodiversity (through provision of biological corridors), groundwater recharge and flood mitigation; it also fosters historical and cultural heritage (places, local knowledge and costumes) and local (rural) forms of organization.

Although the ejidatarios have to deal with a range of threats and stressors (including climate change, minimal government support for agricultural production, rises in prices of supplies, etc.), they were able to identify those related to peripheralization. Most believed that peripheralization endangered their agricultural livelihoods through negative externalities such as pressure from speculators, loss of agricultural land, loss of rural landscapes, and pollution and depletion of water sources. Also mentioned were changes in the landscape such as construction of *fraccionamientos* on parcels of land, as well as increases in population.

In addition, peripheralization impinges on food sovereignty and health, since ejidatarios are forced to alter their relationship with their territory; they have to intensify production and therefore increase significantly the use of agrochemicals (fertilizers, pesticides, herbicides) and of unsuitable wastewater for irrigation (Figueroa, 2016). In order to meet urban demands, they have to switch to market-oriented crops to obtain money to spend on their own increased and transformed needs. This is consistent with other findings in the study area (Méndez-Lemus et al., 2017; Napoletano et al., 2019; Castro, 2020; Madrigal, 2022; Mireles, 2022). Violence, insecurity and robbery are already of major concern for Tarímbaro's residents, and ejidatarios are particularly vulnerable to kidnapping, farm holdups, cattle rustling and theft of irrigation equipment.

Amongst Norms, Regulations, Values, and Principles, to Enforce What Really Matters for Peri-Urban Ejidos

In contrast to other ejidos on the periphery of cities (See Torres-Mazuera, 2009), 10 of these 15 ejidos meet formally and

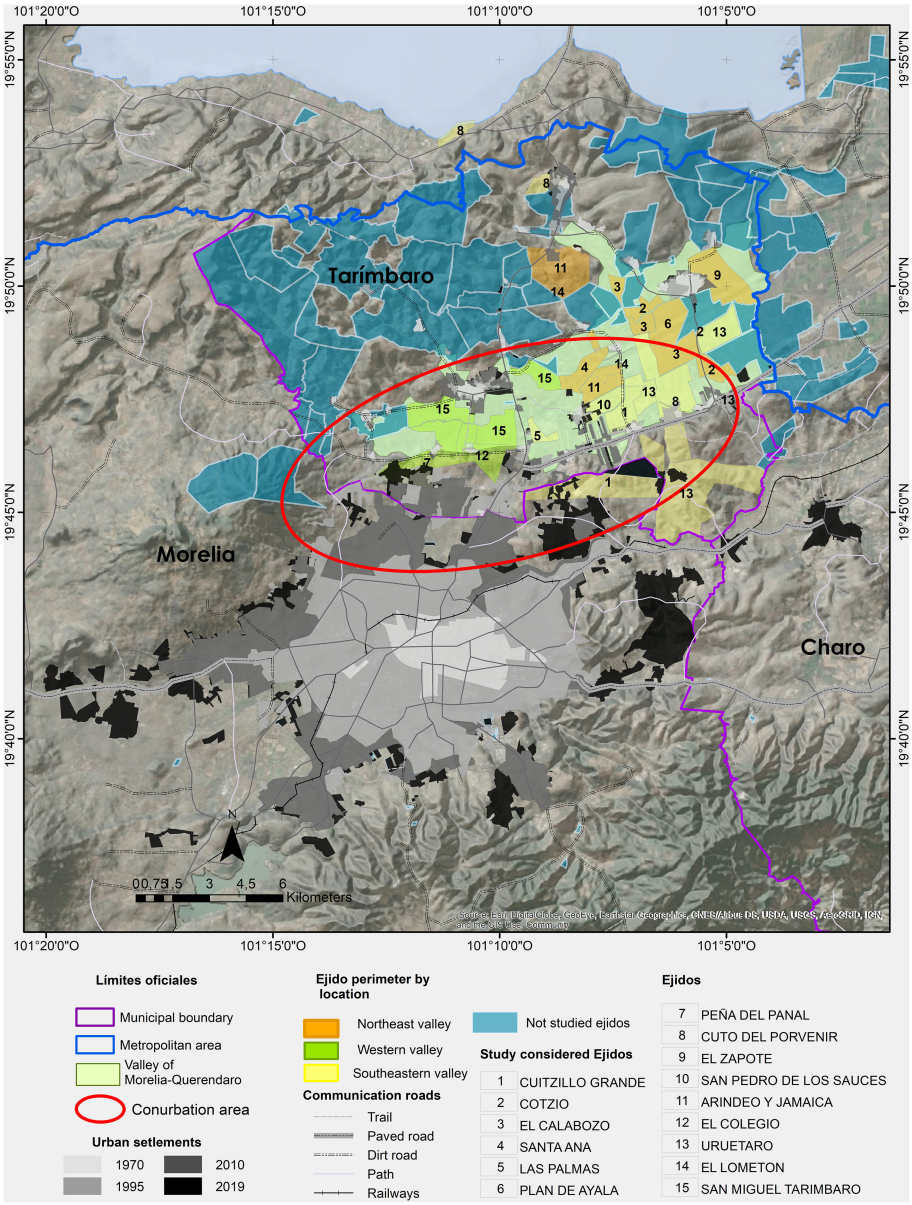

FIGURE 4 | Distribution of the ejidos surveyed.

regularly (monthly or bimonthly) in the General Assembly; the rest meet only when necessary. Attendance at General Assembly is compulsory for ejidatarios. The Assembly is the most symbolic space where social structures take shape, social interaction occurs, and collective agency may be fostered to reduce vulnerabilities created or exacerbated by peripheralization.

Social structures and social interactions within the ejido are basically mixtures of institutional and non-institutional (formal and informal) arrangements to enforce what really matters to it. In most ejidos, ejidatarios respect these arrangements, and this seems to create stability and a general trust. Relationships founded on trust are critical in collective agency because they help to move from a non-cooperative to a cooperative behavior (Rothstein, 2000).

According to presidents, most ejidos have formal internal regulations, but fewer than 50% enforce them; there is a certain degree of tolerance because presidents are convinced that most ejidatarios know exactly how "to conduct themselves." Also, presidents said that sanctions are too severe because the compliance of many ejidatarios is physically limited by age-related constraints. Some presidents also noted increasing conflict within the ejido when they have tried to implement all regulations rigorously. Thus, for the sake and stability of the ejido, they prefer to be more "flexible" in the enforcement of

TABLE 1 | Elements that foster collective agency from the social capital perspective and on the basis of the data available.

Elements that foster collective agency	Features of social capital	Data available from 15 ejidos	Data available from 61 ejidatarios
Social structure	• Spaces of social interaction	• General Assemblies • Frequency of meetings	
	• Formal institutional arrangements (Laws, rules, clear sanctions, procedures and precedents)	• Formal internal regulation and operability • Legal forms of participation, decision making, and conflict resolution (formal)	
	• Informal institutional agreements (Community norms or norms of civil society, self-imposed codes of conduct)	• Decision-making • Power relationships • Respect, solidarity, reciprocity, cooperation	
	• Informal non-institutional agreements (emotions and values and beliefs)	• Main values and principles that guide behaviors (individual and collective) in the ejido	
Social interaction	• Trust derived from ongoing engagement and reciprocity	• Perception of trustworthiness of the leaders • Perception of generalized trust within the ejido (trust in each other)	• Trust in other ejidatarios
	• Reciprocal exchange and Collective learning	• Exchange of material goods • Perception of willingness to share information and knowledge	• Perception of willingness to share information and knowledge to improve production
		• Perception of disposition to learn from each other • Adoption of technology and new practices	• Disposition of interviewee to learn from other ejidatarios to improve production
	• Coordination and collaboration for common good	• Perception of willingness to seek agreements in problem solving within the ejido • Perception of willingness among ejidatarios to coordinate and cooperate for mutual benefits	• Disposition to seek agreements in problem solving • Perception of willingness among ejidatarios to coordinate and cooperate for mutual benefits
Collective capabilities	• Acquisition of collective capabilities	• Ability (of the ejido) to reduce certain aspects of vulnerabilities	• Ability (of the ejido) to implement new practices to reduce vulnerabilities

certain rules (in particular, attendance at meetings and economic cooperation) and sanctions. The most important aspects of the regulations are land sales, attendance at the General Assembly, environmental issues, plot boundaries, rights and obligations, economic cooperation, and land use. In theory, a formal sanction takes the form of suspension of ejidal rights, but this has proved less effective than fines, temporarily restricted access to water for irrigation, and imposition of special duties. For example, ejidatarios must pay a fine if they do not attend Assemblies.

Decisions within the ejido are always collective and formalized in the General Assembly, even if they are preceded by informal negotiations. Yet values and principles expedite the decision-making process by smoothing relationships and facilitating formal and informal negotiations and agreements for the common good. The presidents maintained that most ejidatarios conduct themselves according to common values and principles such as respect, honesty, equity, and loyalty. Solidarity and mutual help were also mentioned as part of the set of values that distinguished their own ejido, along with discipline and hard work. But most importantly, in the context of collective agency, values and principles ensure compliance with the decisions made by the General Assembly as well as the fair distribution of resources within the ejido, since they seem to be decisive not only in overcoming the free-rider temptation but also in motivating reciprocity and trust (Rothstein, 2000; Uslaner, 2002; Ostrom and Ahn, 2009).

Representativeness mechanisms of the ejidos participating in this study are also democratic and formal. According to presidents, members of the ejidal Commissariat (president, treasurer, and secretary) are elected by the General Assembly; this proposes honorable and respectable candidates. Some of the presidents interviewed have been elected twice or thrice in the past. This is in part because the ejidos are relatively small, or because not all ejidatarios are interested in being part of the Commissariat and also because these presidents have proved to be trustworthy in the past, which is the most important criterion. This reduces conflict because most ejidatarios are convinced that their presidents will faithfully represent the interests of the ejido.

Nevertheless, within ejidos, some tensions between individual and collective agencies have forestalled important decisions and

advances because sometimes there are individual interests and opinions that oppose the collective ones. Such tensions may arise through insufficiency of economic resources to implement certain decisions, affiliation to different political parties or different religions, age, gender and relative power within the hierarchy. In such cases, presidents play decisive roles in mediation to ensure that decisions will benefit the majority. However, public discussion and social interaction do not always lead to convergent interest and commitments (Pelenc et al., 2015). For example, a young president may be honorable and respectable, but may have ideas, opinions, and perceptions that differ from those of older ejidatarios. Although the presidents argued that this is not necessarily a difficulty in itself, they recognized that wide disparity between ages can hinder the decision-making process. In most cases, tensions are resolved internally through the General Assembly in conformity with internal (formal and informal) regulations and norms. When resolutions are impossible, and tensions become real conflicts, cases are sent to the Agrarian Authority.

Social Interaction and Collective Agency Within Ejidos

As mentioned before, generalized trust is an important feature of social capital and collective agency because it predisposes/allows/leads reciprocal exchanges, and facilitates collective learning and cooperation for common goals. In the present study, the institutional (formal and informal) and non-institutional arrangements discussed seem to contribute to stability and high levels of generalized trust within an ejido. Not only is this the perception of 11 of the 15 presidents, but also 82% of the ejidatarios interviewed declared they trust (always or almost always) the other members of their ejido (**Table 2**). Although we did not explore in depth specific contexts in which trust judgments arise, our results are important because they show the expectation regarding other members of their ejido and the willingness of respondents to engage in trusting behavior. Trust reduces transaction costs; therefore, individuals tend to cooperate more easily and effectively for common benefit (Rothstein, 2000; Kramer, 2010).

As trust and mutual learning are linked (Gubbins and Maccurtain, 2008), it is not surprising that in most ejidos the interviewees perceived high involvement in collective learning. Fourteen presidents recognized the willingness of ejidatarios to share information and knowledge with each other. That perception was not as high among ejidatarios; nevertheless, 66% acknowledged the reciprocal exchange of information and knowledge within the ejido. Information is one of the most valuable resources shared within the ejido. This sharing promotes learning and action because it helps to improve individual and collective capabilities. For example, in 12 ejidos, the president said that ejidatarios are willing to learn from each other most of the time. This was confirmed by almost 75% of ejidatarios, who acknowledged their own disposition to learn from other ejidatarios to improve production in the face of urbanization. In this context, ejidatarios are willing to adopt ideas/technologies when they know about the experiences of other ejidatarios. Eleven presidents said that always, or almost always, ejidatarios are disposed to adopt new technologies and adapt new practices to improve their agricultural production (and reduce vulnerabilities) in the face of urbanization. This is an important finding, since the survival of groups (and in this case, peri-urban ejidos) depends on collective learning (Gubbins and Maccurtain, 2008).

High levels of generalized trust, ongoing engagement and social interaction not only promote a collective learning environment, but also facilitate cooperation and coordination to pursue shared goals (collective agency) (Rothstein, 2000; Gubbins and Maccurtain, 2008; Kramer, 2010; Pelenc et al., 2015). Accordingly, in the present study, variables representing the extent of disposition to reach agreements to solve problems, and the extent of acceptance of coordination and cooperation for the common good, scored the highest of all variables (>90% in either "Always" or "Almost always") among both presidents and ejidatarios (**Table 2**). Collective agency represents the finalized and autonomous capacity for collective action of a specific group (Pelenc et al., 2015) in the context of the present study and for most peri-urban ejidos that participated. This finding is relevant in efforts to reduce inequalities and differential vulnerabilities on the peripheries of intermediate cities because, through collective agency, ejidatarios might influence emergent social structures (Ibrahim, 2006) that affect their lives within the ejido. Consequently, they might even coordinate and cooperate with other ejidos, organizations and local government to protect agricultural livelihoods in the Morelia-Queréndaro valley and to exercise their right to exist at the edge of the city.

Collective Capabilities of Peri-Urban Ejidos to Reduce Differential Vulnerabilities

So far, we have discussed how collective agency has been fostered within most peri-urban ejidos. Through collective agency, ejidos have been able to exercise their rights and to some extent secure valuable resources to reduce some of the vulnerabilities created by the peripheralization, such as in agricultural inputs, infrastructure, and water. Also, they have protected agricultural land from urban developers, and they have extended certain benefits to their communities. Through the exercise of collective agency, ejidos have not only obtained/secured valuable resources for the group, and even for their communities, but also developed/expanded collective capabilities to ensure agricultural livelihoods (Ibrahim, 2006; Thapa et al., 2012; Pelenc et al., 2015). As other authors have noted, collective capabilities also add new choices to the sets of individual capabilities as a result of their involvement in coordinated collective action (Ibrahim, 2006; Rosignoli, 2018). Nevertheless, as mentioned by Rosignoli (2018), collective capabilities are developed not only to adapt [collective ability to react constructively (resilient capability)], but also to resist (collective ability to oppose top-down decisions) inequalities created by peripheralization. This is relevant to the present study because most ejidos interviewed had developed both resistance (tending to maintain their existence) and adaptation (resilient) capabilities to reduce vulnerabilities in the short term, as illustrated by the following examples.

TABLE 2 | Features of social interaction (within the context of social capital) that foster collective agency in ejidos.

Features of social interaction		Type of respondents	Scale			
			Always	Almost always	Hardly ever	Never
Trust through ongoing engagement and reciprocity	Perception of collective trust within the ejido (trust in each other)	Presidents (15)	5 (33%)	6 (40%)	3 (20%)	1 (7%)
	Trust in other ejidatarios	Ejidatarios (55)	29 (53%)	16 (29%)	7 (13%)	3 (5%)
Reciprocal exchange and collective learning	Perception of willingness to share information and knowledge within the ejido	Presidents (15)	5 (33%)	9 (60%)	1 (7%)	0 (0%)
	Perception of willingness to share information and knowledge	Ejidatarios (53)	20 (38%)	15 (28%)	11 (21%)	7 (13%)
	Perception of disposition to learn from each other	Presidents (15)	10 (67%)	2 (13%)	2 (13%)	1 (7%)
	Adoption of technology and new practices	Presidents (15)	6 (40%)	5 (33%)	2 (13%)	2 (13%)
	Disposition of interviewee to learn from other ejidatarios to improve production	Ejidatarios (52)	19 (37%)	19 (37%)	9 (17%)	5 (19%)
Coordination and collaboration for common good	Perception of willingness to reach agreements to solve problems within the ejido	Presidents (15)	9 (60%)	5 (33%)	0 (0%)	1 (7%)
	Disposition to reach agreements to solve problems	Ejidatarios (53)	38 (72%)	12 (23%)	1 (2%)	2 (4%)
	Perception of willingness to coordinate and cooperate for mutual benefit within the ejido	Presidents (15)	11 (73%)	4 (27%)	0 (0%)	0 (0%)
	Perception of willingness to coordinate and cooperate for mutual benefit within the ejido	Ejidatarios (55)	42 (76%)	11 (20%)	0 (0%)	2 (4%)

Ability to Secure Subsidies and Financial Resources for Agricultural Production

Since most ejidatarios do not have an off-farm job to make or supplement their living, they depend mainly on agriculture. Also, in the context of peripheralization, not only has small-scale agriculture on ejido land become the most important economic activity of the municipality, but it also has multiple functions that benefit local residents. Therefore, subsidies for agricultural inputs and financial resources are important to ensure peri-urban agricultural livelihoods. In this sense, the ejido *Plan de Ayala*, e.g., is very successful in obtaining resources for agricultural inputs (improved seeds, and farm equipment, etc.) from local and federal governments, since members have learnt how to complete the required paperwork to obtain resources and how to submit the relevant support documentation as early as possible to the government officials. Also, the ejido *Uruétaro* has been able to obtain resources from government programmes since ejidatarios have learnt clear lines of responsibility and have leveraged their capacity for accountability.

Ability to Secure Access to Surface Water for Irrigation

In the eastern part of the valley, ejidos depend for irrigation on wastewater from the *Río Grande de Morelia*. Some 6,000 hectares are irrigated with this water and ejidatarios can only cultivate grains and alfalfa. Contamination of this river is a direct consequence of unplanned urbanization of Morelia city, since the city discharges into the tributaries of the river (either partially treated or untreated) industrial, commercial and service waste, leading to a severe pollution problem in the Morelia-Queréndaro valley. Local domestic discharges exacerbate the problem (Figueroa, 2016). This represents a high risk to the health of ejidatarios, their environment and their livelihoods, since wastewater contains high concentrations of *E. coli*.[9] Nevertheless, wastewater has become a resource-base for grain (maize, wheat, sorghum, and oats) and alfalfa production in this area. Wastewater flows through canals that need to be maintained through *faenas* (community coordinated tasks) to secure sufficient capacity and proper circulation for everyone's irrigation.

[9]Concentrations of *E. coli* (CFU) in wastewater samples collected in the east side of the Morelia-Queréndaro Valley in 2012, 2017 and 2018 have been classed as extremely high in accordance with the ecological criteria of water quality established for agricultural irrigation in Mexico (CE-CCA-001/89. Diario Oficial de la Federación, diciembre de 1989).

Ability to Connect More Efficiently With Other Ejidos and With the City

Throughout the valley, the *Caminos Saca-cosecha* programme is establishing new roads that allow people to be connected with others for commercialization purposes. These roads have also been important to provide access for the provision of machinery and other agricultural inputs. With peripheralization, the *caminos saca-cosecha* also function as secondary roads by which ejidatarios and their families can connect to other secondary and primary roads, through the use of private or public transport and can thereby achieve quick access to the city and to other villages. These *caminos* need to be maintained constantly through *faenas* (allocated tasks) but also through municipal resources that are requested by the ejidos.

Ability to Secure Income From Agricultural Production

Peripheralization, together with other factors, has forced ejidos to intensify and diversify their agricultural production for commerce mainly in Morelia city, in order to finance old and new needs. This has led all ejidatarios interviewed to change the purpose of their production from being mainly for subsistence to being commercialized. However, the resultant intensification and diversification can, in the long term, have deleterious effects on public health, environment, and livelihoods [risks posed by peri-urban agricultural practices to health and the environment have been more recently addressed in some ejidos within the study area (Madrigal, 2022; Mireles, 2022)]. In recent years, all have adopted agrochemicals (fertilizers, pesticides, and herbicides subsidized by the local government) and improved seeds. Although ejidal peri-urban agriculture in the valley still needs a labor force (family, neighbors, and other workers), ejidatarios have also mechanized some practices. These ejidatarios are usually willing to share with others their experiences with new seeds, fertilizers, or pesticides. Also, many of them advise others about new agricultural practices to improve production. This seems to be a common and important practice since they hardly ever receive professional advice from the local or state agricultural department. Although some agricultural practices and certain experiences with seeds, fertilizers, and pesticides are not necessarily without damage to the environment and to public health, they give short-term solutions to immediate needs.

Agricultural technology is not always a problem. During data collection, 10 ejidos coordinated efforts to invest in subsidized irrigation hydrants to optimize water resources through pressure irrigation. Also, some ejidos have incorporated organic fertilizers (such as guano) in their systems and this idea is spreading through the valley.

Ability to Reduce Agricultural Land Sales for Urbanization

Apart from the multifunctional role of agriculture in the study area, there is a strong cultural attachment to land and agricultural livelihoods. Nevertheless, peripheralization has exposed agricultural livelihoods to pressure from speculators, loss of agricultural land, and loss of rural landscapes. According to ejidatarios, at the beginning of the new millennium, the price of unserviced ejido land (mainly common land) for urbanization purposes was 160,000–350,000 Mexican pesos per hectare [lower than the national average reported for the 1990s (Jones and Ward, 1998)]. Nevertheless, prices of agricultural unserviced land have increased considerably in recent years. For example, in 2014, the price per hectare of irrigated land in the southwestern part of the municipality was ∼900,000 Mexican pesos, and in the common land (hill) the price was ∼1.2 million. This has been the subject of discussion in the ejidos' General Assemblies because they have the right to authorize (or bar) land sales and the endorsement of dominio pleno. Presidents explained that sometimes ejidatarios need to sell their plots of rainfed land (mostly common land) which nowadays is used neither for cultivation nor for animal production, so the Assembly authorizes such transactions. However, land sales in the valley for urbanization are currently not allowed. This is because ejidos had already made formal and informal agreements in their General Assembly to secure agricultural livelihoods. Some presidents mentioned that land transactions would be authorized only amongst ejidatarios or *avecindados* (settlers) that have the intention to keep the land for cultivation.[10] Here, most ejidos have made internal agreements to evade land transactions with outsiders. They have learnt about the adverse effects of urbanization on their communities and livelihoods, so they want to make better decisions for the sake of their families. However, when this is not possible, ejidos try to get compensation in terms of money but also land for collective use.

CONCLUSIONS

Neoliberal urbanization has created heterogeneous and unequal geographies, and this has transformed rural landscapes around intermediate cities. In the context of the peripheralization of rural areas surrounding Mexican intermediate cities, this paper has illustrated how collective agency is fostered within peri-urban ejidos to reduce some of the vulnerabilities of their agricultural livelihood to the unequal processes through which urban peripheries emerge. Apart from the new vulnerabilities associated with peripheralization, and the strong pressure from different social sectors interested in urbanizing unserviced agricultural land in peri-urban spaces, ejidos in peri-urban areas face long-term problems derived from a crisis in production (such as rising prices of supplies, unfavorable pricing, excessive profit margins for commercialization channels and agents, and a decrease in the profitability of farming activities), from climate change, and from limited government support. Also, they have to resist political adversities such as power structures and both government and private bureaucracies, corruption, and state patronage. In this context, peri-urban ejidos have managed to mitigate the impacts

[10]Land conversion in the valley is prohibited by the Urban Development Program. Nevertheless, 14 of 15 Comisariados ejidales' presidents were unaware of the existence of the Program at the moment of data collection, and therefore the actions set out by the ejidos reflected internal agreements rather than formal legal requirements from the municipality.

of these problems by strengthening their social capital. Collective agency (as an end of social capital) is important here, not only to achieve common goals and to acquire collective capabilities to ensure their agricultural livelihoods, but also to influence emergent social structures and exercise their rights to exist at the edge of the cities.

Most of the ejidos that participated in this study have coordinated and cooperated for the common good. Collective agency cannot be imposed but it is not spontaneous either: it depends on the functionality of social capital within these peri-urban ejidos. In this regard, social engagement and social interaction within peri-urban ejidos are not only formally agreed; on the contrary, they are an amalgamation of formal and informal institutional and non-institutional agreements (such as values and principles) to enforce what really matters for ejidatarios. These kinds of agreements are effective in creating stability and generalized trust, which predisposes/allows/leads reciprocal exchanges of information and knowledge that in turn facilitate collective learning and cooperation to pursue shared goals. Collective agency within peri-urban ejidos has been useful in securing valuable resources to reduce some of the vulnerabilities created or exacerbated by peripheralization.

Collective capabilities have been developed for adapting and for resistance. These have enabled ejidatarios to subsist and resist; even so, land has been alienated and livelihoods have been subordinated to capital accumulation. In this context, collective capabilities have been effective in reducing vulnerabilities in the short term, but they are hardly ever viable in the long term because they threaten health and the environment of local communities. Thus, the scope over time casts doubts on the permanence of peri-urban ejidos (as social organizations) and ejidal peri-urban agriculture (as a livelihood), because they are highly vulnerable socioeconomic structures that are drastically disrupted by the onslaught of the prevailing economic model and the prevailing urbanization processes.

Therefore, although we consider there is an urgent need for fostering collective agency and collective capabilities within and among peri-urban ejidos to negotiate more forcibly whatever is important to their lives and reduce further inequalities, it is also crucial to foster channels of coordination and cooperation with local and state governments, universities/research centers and other non-government organizations. Indeed, planning and implementation of concrete long-lasting actions to protect and regulate livelihoods based on ejidal peri-urban agriculture requires the following: first, to recognize all the benefits that peri-urban agricultural livelihoods bring to local and regional development; then, to understand the complex framework of intertwined inequalities and disadvantages that peripheralization creates/exacerbates around intermediate cities.

AUTHOR'S NOTE

A preliminary version of this paper was published under the title of Periurbanization, agricultural livelihoods and ejidatarios' social capital: Lessons from a periphery municipality in Michoacán, Mexico, in *Procedia Engineering (198* (2017)) as part of the proceedings of the Urban Transitions Conference, held in Shanghai, in September 2016.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: datasets contain identifiable human data that cannot be publicly available. Requests to access these datasets should be directed to YM-L, ymendez@ciga.unam.mx.

ETHICS STATEMENT

Ethical review and approval were not required for this study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements. Nevertheless, all potential participants received adequate explanation about the purpose of this study and freely chose to participate or not. Anonymity was assured and confidentiality was guaranteed. Consequently, identifiable information has been omitted to avoid potential harm.

AUTHOR CONTRIBUTIONS

YM-L coordinating author, developed research design, and drafted the paper. YM-L, AV, and LP fieldwork and data collection. YM-L, AV, LP, BT, and CR-L intellectual contributions and edits. All authors have made important contributions to this paper and approved it for publication.

FUNDING

This paper was supported by the PAPIIT-DGAPA-UNAM through the project "New geographies of urbanization in Mexico: territorial transformations and vulnerable livelihoods in the peripheries of medium-sized cities" (Grant Code: IG300319).

ACKNOWLEDGMENTS

Authors would like to thank Ann Grant for the exceptional editing work, Alejandra Larrazábal for the management of spatial information and creative cartography design and Rosasura Páez for the collection and analysis of wastewater in the study area. We are also very grateful to the ejidatarios from the 15 ejidos that were willing to take the time to participate in this study, and to the members of the Urban and Peri-urban Research Group from the Environmental Geography Research Centre (CIGA-UNAM), for their support in data collection as well as their insightful discussions.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frsc.2022.816649/full#supplementary-material

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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.