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Socio-Environmental Regimes and Local Visions

Transdisciplinary Experiences in Latin America

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ECOSUR

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Foreword

The rural area in several countries of Latin America presents differences and similarities; it is in this region where the main foods for its population are produced. In addition, it is essential for the conservation of the environment and biodiversity. This book discusses some problems of the rural environment with studies carried out in seven countries. Poverty and inequality are two of the main problems in Latin America. With respect to poverty, according to the Economic Commission for Latin America and the Caribbean (ECLAC), in 2018, 30% of the population in this region was in poverty and 10.7% in extreme poverty. Poverty occurs in different ranges among the countries within Latin America. This can be seen in the poverty percentages of the population that is in this condition and that were included in this book: Argentina 24.4%, Bolivia 33.2%, Brazil 19.4%, Colombia 29.9%, Honduras 55.7%, and Mexico 41.5%. These data are disturbing; however, poverty in rural areas is more drastic, reaching approximately 45.1% of rural households. Most of the indigenous and other traditional peoples are found in rural areas. The World Bank identified 400 indigenous peoples in Latin America, which constitute approximately 10% of the population and correspond to approximately 50 million people. Indigenous peoples have been historically excluded, and this situation manifests itself in the fact that the majority (61.5%) of indigenous households located in rural areas are in poverty. Those are the characteristics of the population studied in this book, peasants and indigenous people whose living conditions are very hard.

Natural areas and biodiversity have been drastically reduced over time, both by natural events and by anthropogenic issues. An example of the magnitude of the deterioration is the loss of the forest area, which reached 97 million hectares in the period 1990–2015 (ECLAC), and the destruction of natural resources for the profit of the capital continues.

In the last decades, a series of governments with different political characteristics have ruled Latin American countries; however, in general terms, the economic policy directed towards the countryside has been to promote commercial agriculture at the cost of the use and destruction of the environment, as well as the exclusion of small-scale agriculture.

These principles have led to irrational positions such as the case of the fires in 2019 that occurred in the Brazilian Amazon, which affected a large area of the jungle destroying biodiversity, and for which apparently there was no adequate response from the Brazilian government. Examples of these policies are unfortunately abundant in many countries. In the case of Argentina, monoculture has been promoted, with the sowing of more than 17.5 million hectares of soybeans in 2019, affecting the environment. These policies have supported large companies to profit from the destruction of the environment. The same happens with respect to mining that is carried out in various countries, where the interests of large companies take precedence, which have allowed them to carry out activities in large land extensions. For example, in Mexico the surface area granted in concession to mining companies corresponds to more than 11% of the national territory. The stripping of natural resources has been constant, and in an attempt to preserve them, protected natural areas have been created in Latin America and the Caribbean which according to ECLAC, estimates for 2014 were 4,808,746 km^2.

Peasants and indigenous people have practiced agriculture in small areas with the use of traditional technology, and due to their attachment to the land, these groups have defended and conserved natural resources over time. Government initiatives to preserve these resources are totally insufficient in the presence of natural disasters, the degradation of areas due to inadequate agricultural management, the authorization of companies that are predatory on the environment, and illegal activities, among others, that affect natural resources. There are laws that protect these areas, but the voracity of companies threatens natural resources and this is where communities and their organizations, with a leading role of indigenous groups, carry out resistance movements and fight in defense of their culture and their subsistence means.

The problems above described related to public policies are discussed in this book and the relevance of which lies in:

- The topics covered are fully current and provide knowledge to researchers who carry out studies in the Latin American rural environment.
- It addresses common issues and topics with studies in seven Latin American countries (from southern Mexico to the Argentinean Patagonia).
- The studies are generally directed towards small agriculture and focus on indigenous and peasant groups, populations with high levels of poverty.
- Transdisciplinary approaches were used for the analysis of the studies presented.
- It makes use of various qualitative and quantitative research techniques. In this sense, it is necessary to highlight that the majority of the case studies were carried out through participatory approaches involving the inhabitants of the communities.
- Territorial contrasts are presented, from small case studies to the analysis of large areas.

– It analyzes the role of traditional technology and culture of the inhabitants of indigenous groups and peasants, in the conservation of natural resources and local food production.
– It includes the participation of a high number of prestigious academics from various universities and research centers from Latin America.

Reading this book provides knowledge to researchers interested in rural areas and also guidelines that could be incorporated into new public policies in some Latin American countries. The most important thing is that, it explains several problems faced by the peasant and indigenous communities and proposes some concrete solutions towards improving the living conditions of the rural population.

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Dr. Benito Ramírez Valverde

Acknowledgements

This book results from collaborative research that has been undertaken primarily by scholars of seven Latin American countries with their colleagues as well as with their graduate and undergraduate students. Currently, they all are based either at research centers, public universities and NGOs. On the one hand, all chapters addressed the relevance and contribution of small farming systems and traditional livelihoods to several arenas, including indigenous and traditional people's autonomy, food security, health, intergenerational transmission of knowledge, indigenous customary law, and community self-organization, among others. On the other hand, the majority of chapters assessed coping, resistance, and adaptive strategies used by small farmers, peasants, indigenous and other traditional peoples in confronting the socio-environmental regimes effects and to a lesser degree, the educational regime effects.

In assembling this Latin American case studies collection we had several goals. First, we wanted to take into account the diversity of organizations, rural occupations, and professionals (i.e., the local action groups and the group of producers) working to support sustainable rural production systems but also acknowledging the importance of alliances built among these actors. Second, from interactions of the Local Socio-Environmental System's actors presented in the case studies, as well as from our own previous experience, we wanted to provide insights on how could it be the nature and scope of new public policy for Latin America's rural people and their territories. The latter informed advice is presented in the closing chapter.

We are very grateful for the commitment and contributions of all the authors. We acknowledge and appreciate the time of Ms. Alison Macnaughton for her feedback on the contents and English grammar editing of the book project's proposal. We value the time and constructive criticism from the many people who have reviewed individual chapters because their feedback enhanced the quality of the book. Every single chapter went through a peer review process by two or three reviewers. Among them, one or two reviews were completed by one of the Editors. We appreciate the time and words of Dr. Benito Ramírez Valverde from the Colegio de Postgraduados, for writing the book foreword.

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Part I
Introduction

Chapter 1
Local Socio-Environmental Systems as a Transdisciplinary Conceptual Framework

Manuel Roberto Parra Vázquez, Minerva Arce Ibarra, Eduardo Bello Baltazar, and Luciana Gomes de Araujo

Abstract In this chapter, we introduce the scenario of the book and provide the theoretical foundations of its key topics—socio-environmental regimes, innovation niches, local visions, and transdisciplinary approaches, as well as the interactions among these topics—which we use to analyze indigenous and other rural production systems in Latin American (LA) territories and communities. Most of the studied territories are located in diverse geographic regions, including the Mayan jungles and the Amazon that the literature recognizes as lands in which high biodiversity and indigenous and traditional peoples are interwoven. In order to analyze diverse rural productive sectors in LA territories, we propose the Local Socio-Environmental Systems framework which is rooted in systems theory. This approach is sufficiently flexible to be compatible with the particular assumptions and theories that a given research team chooses to apply to a given territory. We used Bonfil-Batalla's cultural control theory to explore the territories addressed in this book, categorizing them according to the sources of rural producers' key local resources and their capacity for decision-making regarding these resources. We also discuss the manner in which we have shifted from disciplinarity to transdisciplinarity in our research in indigenous and other rural territories. We view transdisciplinarity as a way of combining scientific knowledge and social practices. Thus, transdisciplinarity involves

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praxis as well as discussion and consideration through a spiral of exchanges of knowledge in which participants play interchangeable roles: we are all novices; we all learn; and we all produce knowledge. Transdisciplinarity involves a critical interculturalism perspective to promote dialogue among different worldviews. The final section briefly summarizes the book's chapters, which present case studies from seven LA countries—Argentina, Bolivia, Brazil, Colombia, Cuba, Honduras, and Mexico.

Keywords Systems theory · Transdisciplinarity · Cultural control theory · Territory · Socio-environmental regimes

1.1 Introduction

This book addresses a set of Latin American (LA) transdisciplinary investigations of local use and traditional management and conservation of landscapes in rural territories, which have historically been influenced by rules dictated by multi-level socio-environmental regimes. In addressing this topic, we consider ethnobotany to have been key to developing a set of multidisciplinary studies by Latin American scholars, beginning in the early 1970s with studies on human–plant relationships over time and space and across cultures within Mexico (E. Hernández Xolocotzi, 1913–1991) (Hernández, 1959; Hernández & Solano, 1982). Therefore, ethnobotany is the starting point for developing the conceptual framework of this book.

Half a century ago, ethnobotany studied human–plant relationships on a local level in a variety of contexts, addressing a study object through various academic disciplines, including biology, botany, ecology, and agronomy. Over time, ethnobotanical studies shifted from analyzing an "object of study" to holistically addressing a "subject of development," engaging researchers and students in local processes of change and development. As a result, there was a need to adapt the research approaches of ethnobotanical studies to include such intrinsic factors in local social processes as food, work, health, education, security, and justice. For this reason, research projects gradually incorporated economists, anthropologists, sociologists, educators, lawyers, etc. Many research teams, in collaboration with other social actors, sought to improve rural livelihoods while also conserving local landscapes and natural resources. As a result, networks of cooperation have been established over time in diverse rural LA territories. In building these networks, researchers have used several strategies to develop collaborative relationships based on trust and solidarity between inhabitants of rural territories with difficult access and little means of external communication on the one hand, and other participants in research projects such as NGOs and independent consultants on the other hand. Such collaboration involves recognition and respect for the human rights of indigenous and traditional peoples and other rural producers.

As a result of the so-called globalization during the second half of the twentieth century, States' borders began to become permeable to free trade of goods, capital, and people (Wallerstein, 2005). This had repercussions for human–plant research worldwide, including in Latin America. One striking example is the Millennium Ecosystem Assessment, based on the idea that human well-being and sustainable development require better management of Earth's ecosystems (WRI, 2003). Given such global transformations, scholars who formerly carried out research on human–plant relationships now needed to broaden their research to consider "human–environment" relationships. To pursue this endeavor, scholars across LA have devised endogenous context-specific theoretical models for approaching research in rural territories (e.g., Futemma, 2013; Martínez-López, Cruz-León, Sangerman-Jarquín, Cárdenas, Herrera, & Ramírez-Valverde, 2019). One such model is the Local Socio-Environmental System (LSES) framework (see Sect. 1.1.1).

LSES has been applied—either fully or partially—to the majority of the case studies addressed in this book. It is sufficiently flexible to be compatible with the specific models, assumptions, and theories of any given research team. Therefore, the fact that the different researchers contributing to this book used components of a single framework allowed for comparing case studies from different territories and identifying their typology. In carrying out a transdisciplinary comparative analysis, we identified a variety of patterns of response to the socio-environmental regimes in place in the studied territories, as analyzed in the closing chapter (see Bello-Baltazar et al. Chap. 21, this volume).

With this book, we seek to identify, describe, and analyze social and technical innovations that are being devised in the LSES studied. These innovations are the result of multiple interactions among factors—which include territorial configuration, power relations among social actors, traditional and indigenous knowledge, environmental drivers (threats and opportunities), the market, and current public policies. Moreover, innovations are the result of peoples' capacity to respond to global processes.

Over the past three decades, transformations resulting from globalization have favored establishment of a global neoliberal[1] socio-political regime. In the 1990s through multilateral agreements, the World Bank (WB) institutionalized a mechanism of "conditionality lending" (de Moerloose, 2014; Vordtriede, 2019, p. 1), by which each signatory country must modify its laws to align them with a development agenda directed by international financial institutions. For example, if a country participates in these agreements, the WB offers to fund its development initiatives or other federal programs. A country's access to funding is conditioned by its government complying with rules set through this mechanism. Therefore, a participating country provides prior informed consent to complying with rules established

[1] We understand the term "neoliberal" as a characteristic of neoliberalism, which according to Harvey (2006, p. 145): "Neoliberalism is in the first instance a theory of political economic practices which proposes that human well-being can best be advanced by the maximization of entrepreneurial freedoms within an institutional framework characterized by private property rights, individual liberty, free markets and free trade."

through multilateral agreements. From 1980 to 1993, LA borrowed more money from the WB for structural adjustment than any other region of the world. In the case of Brazil, such loans allowed the WB to expand its operations in education, health, the environment, and other areas. By the end of the 1980s, environmentally based criticism by North American and European NGOs had begun to be incorporated into WB operations, for example, with respect to the impact of construction of a road to connect southern and northern Brazil (Pereira, 2014).

Considering this global socio-political context, through LA case studies, this book aims to identify ways in which the neoliberal regime operates in different sectors of rural producers. We also aim to compare and contrast innovations and other responses by different local actors to the reigning regimes. Below we present the attributes of LSES, and—using a relational perspective—discuss our past research and provide several examples of research in rural and indigenous settings.

1.1.1 General Attributes of LSES

We understand a conceptual framework to be a set of concepts which are useful for examining a given topic. The LSES conceptual framework is rooted in systems theory,[2] which allows for identifying salient characteristics of the LSES in each case study included in the present volume. LSES also allows for communication among scholars who work in rural territories, as well as among these scholars, the communities, and external agents. An LSES is comprised of people and therefore contains a significant social component (Fig. 1.1).

We follow the argument of Niklas Luhmann (1990), who contends that social systems are neither hierarchical nor nested, but rather consist of multiple interrelated sub-systems. Thus, we portray an LSES as a complex adaptive system made up of four sub-systems which are interrelated based on the fact that they are connected to a single territory (Fig. 1.1). These sub-systems are: (i) landscapes; (ii) the group of producers, consisting of indigenous, peasants, and other rural small-scale producers, including fishers; (iii) the socio-academic group, consisting of researchers, members of NGOs, and students; and (iv) the political-economic group, consisting of governmental official in charge, and entrepreneurs (the regime's agents; Fig. 1.1). Understanding these four components of the system—as well as their interactions—allows for comprehending processes of change that occur in indigenous and other rural production systems.

For purposes of this chapter, we understand a territory to be a social construction resulting from interactions among multiple actors, involving power relationships

[2] We understand a system to be a set of components which are interconnected such that they produce their own pattern of behavior over time. As most systems consist of a large number of components, they may be fully understood by analyzing not only their components but also the complex interactions among components, as well as between the system and its environment (Cilliers, 1998; Meadows, 2008).

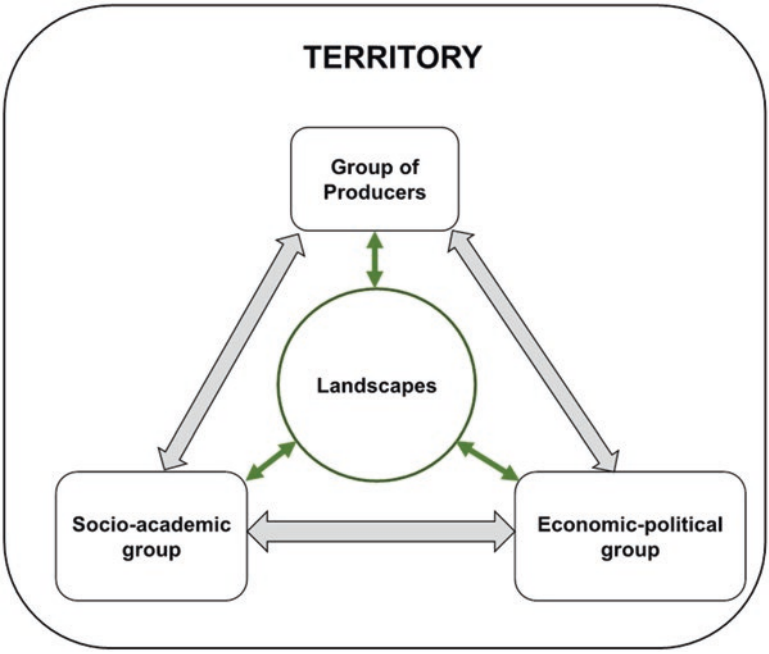

Fig. 1.1 The Local Socio-Environmental System (LSES) framework (Source: Adapted from Parra-Vázquez, González-Espinosa, Nahed-Toral, García-Barrios, Bello-Baltazar, Estrada-Lugo, & Cruz-Morales (in press))

(Zamora Chap. 11, this volume). As shown in Fig. 1.1, we identify three categories of social groups that act in a single territory on different geographical and political scales: rural producers and the organizations to which they belong, socio-academic actors, and economic-political actors. For a better understanding of the contribution of the concept of social actors to the field of new rurality in Rural Latin American studies, see Norman Long (2004).

Each of the components in Fig. 1.1 has been the subject of several academic disciplines. Territory has been the subject not only of history and geography, but also more recently of agroecology; the group of producers has been the subject of anthropology, sociology, and ethnobiology; the socio-academic group has been the subject of sociology and economics; and the political-economic group has been the subject of political sciences, history, economics, and sociology. LSES are complex systems which cannot be properly addressed through a single discipline. In the past three decades, academics have been shifting from multidisciplinary to interdisciplinary and transdisciplinary approaches to analyzing complex systems (Armitage, Charles, & Berkes, 2017; Berkes, 2015; Conde Flores, Ortiz Báez, Delgado Rodríguez, & Gómez Rábago 2013; Lazos-Chavero, Mwampamba, & García-Frapolli, 2018; Leff, 2006; Parra-Vázquez & Díaz-Hernández, 1985). In addressing LSES, it would be helpful to combine knowledge and practices from several fields such as—depending on the case at hand—agroecology, anthropology, sociology,

economics, law, and political sciences, as well as other types of knowledge such as traditional and indigenous knowledge. Over decades of fieldwork and research experience, we have recognized that in order to contribute to improving the living and working conditions of rural producers in general, there is a need to address how they could cope with and resist development initiatives by the dominant regime. To this end, some scholars and other professionals join together to support local innovations to deliberately catalyze territorial change (Nieto Masot & Cárdenas Alonso, 2015); we refer to these actors as the socio-academic group (Fig. 1.1).

Changes in an LSES emerge from the relationships among various social groups present in the territory as well as from endogenous and external environmental dynamics affecting the territory. The territorial configuration of an LSES is a result of historical social practices and power relations that conform people's "habitus" (Bourdieu, 1990, p. 52). Both local and external norms that govern daily life shape territorial livelihoods. Diverse livelihoods generate tangible and intangible values which are often disputed by local actors, while witnessed and/or influenced by external actors. Most of the authors of this book used participatory research approaches which allowed for comprehending the type of changes sought by rural families in their territories and analyzing differentiated local responses to global drivers.

1.1.2 Components of LSES

1.1.2.1 Landscape and Territory

We refer to landscape as a marine or terrestrial area that has a certain level of homogeneity, formed by a complex set of systems resulting from multiple interactions among rocks, water, air, flora, fauna, and humans. Moreover, the features of a landscape are distinguishable from those of other neighboring areas (Mejía-Ávila, 2007, p. 10). A landscape is a representation of an ecosystem together with the local population's social and economic organization that allows for comprehending the relationship between society and nature (Infante-Ramírez, Arce-Ibarra, & Bello-Baltazar, 2014). Several landscapes together (i.e., rainforest, grasslands) create a territory.

A key concept to understanding territories in which people carry out agriculture is agroecosystem. In our participatory research in rural communities, we have observed that a family or community often uses a combination of ecological niches in a diversity of agroecosystems. In a seminar on agroecosystems held in Mexico in 1976, Professor Efraím Hernández Xolocotzi proposed a simple yet broad and useful definition of agroecosystem: an ecosystem in which humans use natural resources for crop agriculture, livestock raising, forestry, and wildlife management, thereby modifying the ecosystem to a or greater or lesser extent (Hernández, 1977). Each agroecosystem results from the accumulation of knowledge of many individuals, which results in specific agricultural practices (Hernández, Inzunza, Solano, Arias,

& Parra, 2011) as well as in social and cultural practices that underlie territorial identities.

We regard a territory as a portion of land—including soil, subsoil, water, and air—impacted by both dynamic social and natural processes. Each territory has been inhabited by social groups that continually try to appropriate it. Objective appropriation occurs through labor to adapt the land to peoples' needs, whereas subjective appropriation occurs whenever people give meaning to land and this meaning is validated by the community's norms, values, and behaviors. Each territory has a specific configuration which has been shaped by a combination of socio-environmental conditions resulting from power relations and control of space (Haesbaert, 2013). Therefore, territories undergo differentiated patterns of change over time. Throughout history, public institutions have been in charge of defining and controlling territories although the private sector has often exercised this control through their investments, and occasionally civic organizations do so through social movements (FAO, 2019). In this book, the addressed territories contain enormous forested and marine areas with first-rate biophysical reserves of water, minerals, flora and fauna, which are among the most important highly biodiverse landscapes in the world, including the Mayan jungles and the Amazon. These and other LA's territories are recognized as lands in which high biodiversity and indigenous and traditional peoples are interwoven (Peña-Azcona, Estrada-Lugo, Arce-Ibarra, & Bello-Baltazar, 2020; Puc-Alcocer, Arce-Ibarra, Cortina-Villar, & Estrada-Lugo, 2019).

According to Bonfil-Batalla (1991), the theory of cultural control allows for classifying territories taking into account ownership of key local resources (local ownership versus ownership by an external actor) and the decision-making capacity over those resources (local decision-making versus decision-making by an external actor). Thus, according to this theory, the following scenarios can be found in studied territories: (a) an "autonomous territory," in which local people have both ownership and decision-making power over resources; (b) an "alienated territory," in which local people have ownership over resources but decisions regarding their use are made by one or more external actors; (c) an "appropriated territory," in which local resources are owned by one or more external actors but decisions regarding their use are made by local people; and (d) an "imposed territory," in which one or more external actors have both local ownership and decision-making power over resources (Table 1.1). Such analyses are further discussed in Chap. 21 of this book,

Table 1.1 Classification of a territory based on the cultural control theory

Resource ownership		Decision-making over resources	
		Local decision-making	Decision-making by external actor/s
	Local ownership	**Autonomous territory**	**Alienated territory**
	Ownership by external actor/s	**Appropriated territory**	**Imposed territory**

Source: Adapted from Bonfil-Batalla (1991)

which contains a synthesis of the case studies using cultural control theory (see Bello-Baltazar et al. Chap. 21, this volume).

According to our past as well as current research, continual territorial transformations and socio-environmental innovation processes result in divergent territorial trajectories. This occurs partly due to the fact that interactions among the three types of actors in an LSES (group of producers, political-economic group, and socio-academic group) do not follow a given pattern; rather, the types of interactions are context specific. We regard interactions among these three types of actors as collective actions characterized by asymmetrical power relations which are expressed in different manners depending on the territory. For instance, for one of the case studies included in this volume, the researchers played a role as critical external observers of the rural producers (Macehual Mayan *campesinos*) but had no relationship with the political-economic group (Segundo et al. Chap. 3, this volume). Another case study (De La Cruz et al. Chap. 2, this volume) presents results of research by a socio-academic group which—after resolving cultural and communication difficulties—was able to establish an alliance with the indigenous producers (Tikuna, Uitoto, Bora, Cocama, and Inga peoples) in order to confront the political-economic group. In a third case study (Trejo et al. Chap. 17, this volume), taking on an external position as critical observers, the researchers explain the interactions (and confrontation) between African palm growers and the company that promotes and purchases this crop (part of the political-economic group). In yet another example (Herrera & Guerrero Chap. 5, this volume), the socio-academic group establishes a strong relationship with coffee growers and confronts the coffee buyers (part of the political-economic group). We argue that all these transformations and processes occur under a single political-economic regime.

1.1.2.2 The Political-Economic Group (or Regime's Agents)

To better comprehend the concept of "regime," we should understand it as part of a political system. David Easton (1965) points to three components of a political system:

- Political community: a group of people interconnected as a result of social division of labor.
- Political regime: within a political community, the set of norms, values, and structures defined by authorities in order to distribute and organize power.
- Authority: those people who occupy a role in a system's political management.

A government is comprised of a set of institutions to which another party has granted the exercise of power (Bobbio, Matteucci, & Pasquino, 1991), and public policies are actions by a government to correct or modify a social or economic situation that has been publicly recognized as a problem (Merino, 2013). The interrelationship among the political community, the political regime, and political authority is as a subject for political research.

On a local level, public policies are put into place by local governmental officials who receive funding to implement policy which is often dictated from higher political levels. Local governments make agreements with a variety of local actors to institute local territorial regimes. Therefore, each territory has a government and a regime with specific attributes that vary from one territory to another.

On a national level, governments are in charge of establishing public policies which determine actions to be carried out in different public sectors (e.g., economy, health, education). Governmental institutions such as ministries, departments, or secretariats are in charge of implementing public policies which in turn form sectoral regimes. According to Bourdieu and Wacquant (1995), this form of organization results in a set of administrative fields in which governmental and non-governmental agents—individually or in groups—struggle for power over any particular economic sector. This is carried out by means of laws, regulations, administrative measures (subsidies, permits, etc.), and any other process that may be used to implement public policy.

On an international level, regime refers to a set of principles, regulations, international summits, institutions, and procedures for decision-making used to govern taking into account different actors' claims or interests within specific economic sectors (Pigrau Solé, 2015), including education and law. In recent decades, national governments have adopted regulations resulting from international agreements (i.e., from the global regime), implementing them through national or sub-national regimes. We refer to socio-environmental regimes as those regulations resulting from international agreements implemented by national and sub-national regimes to address social and environmental issues. As they are implemented in specific territories, they may also be referred to as territorial regimes.

1.1.2.3 The Group of Producers and Their Social Organizations

In all of the cases studied in this book, the group of rural producers carried out local actions in their systems of production and participated in many social movements. In many rural indigenous settings, such as in Mexico's lowland Mayan region, there are Mayan peasants which system of agricultural production is organized into domestic groups (Estrada Lugo, 2011; García et al. Chap. 6, this volume). As these groups carry out collective actions, they act either as communities or peasant organizations. These rural producers belong to different social organizations distinguished by their livelihoods. We regard a livelihood as the daily activities of a group of rural producers including their practices and discourses (Herrera, Parra, Liscovsky, Ramos, & Gallardo, 2017). In their rural contexts, these social actors seek to secure access to essential resources including natural and man-made capital—whether tangible or intangible—in order to carry out a set of activities (strategy) through which they may satisfy their needs (Herrera et al., 2017). These needs may be objective—such as food, or subjective—such as shelter. The way in which families and other rural producers organize their activities to interact with their socioeconomic environment is governed by both local norms of behavior and

regulations established by socio-environmental regimes (Cartagena & Peralta Chap. 19, this volume).

We argue that opportunities for rural families to carry out social reproduction are dependent on their capacity for agency, their decision-making capabilities, and their collective action (Parra-Vázquez et al., in press). People's capacity for agency is dependent on structural conditions which in turn are based on asymmetrical power relations (Zamora Chap. 11, this volume). Therefore, innovation niches (Ingram, 2015) created by socio-academic groups play an important role in social reproduction.

Domestic groups or families live in communities or other types of social units in which social interactions take place and co-territorial relationships exist. In rural contexts, a community has several roles—as a unit of collective production (as in the case of the common property or "*ejido*" that practices forestry, see Chale-Silveira et al. Chap. 8, this volume), but also as an entity with the capacity to mediate between local rural economic systems on the one hand and regional, national, and global economic systems on the other (Parra-Vázquez et al., in press; Cartagena & Peralta Chap. 19, this volume).

On a community level, social organizations serve as intermediaries between policies established on a macro-level and the local political-economic group. The ability of rural people to carry out economic activities—which includes having access to landscapes and the resources within them—depends on them being community members with the associated rights and obligations. Families and other rural producer groups are not only connected to communities, but also to markets and other social networks through which they sell their goods and labor (including through migration), and obtain goods and services (Appendini & Nuijten, 2002).

The nature of these connections depends on the relationships that communities establish with other social organizations (e.g., cooperative, community assembly) oriented toward specific objectives (Scott, 2005).

Sergio Gómez (2000) proposes that rural or peasant organizations be classified into three categories, according to their objectives and the behavior of their members: (i) economic organizations which seek commercial benefits for their members; (ii) corporative or professional organizations which seek only to benefit their members regarding specific issues; and (iii) solidarity organizations with "universal" objectives that affect their entire sector, not just members of their organizations.

Other researchers also point out the existence of political organizations (de Grammont & Mackinlay, 2006). Some such organizations are subordinated to political parties; others have relationships with political parties but maintain their autonomy; and still others reject any relationship with political parties, arguing that political parties reproduce and replicate hegemonic structures.

1.1.2.4 The Socio-Academic Group

We address socio-academic groups by building on the experience of Local Action Groups (Grupos de Acción Local) in the European Union's LEADER project (Nieto Masot & Cárdenas Alonso, 2015). Socio-academic groups are comprised of scholars, members of NGOs, students, etc. who design, develop, and implement socio-environmental innovation strategies in rural territories. These groups principally consist of people from public institutions (universities, research centers), and NGOs[3] that have non-profit objectives, as well as social or economic actors from the territories themselves.

We define socio-environmental innovation (Bello-Baltazar, Naranjo-Piñera, & Vandame, 2012, p. 12) as a process of action research in territories in which a set of actors participates according to their interests, mission, and capacities in specific scientific, technological, organizational, financial, and/or commercial activities with the objective of not only providing a creative response to problems related to rural development and natural resource conservation, but also generating knowledge that facilitates the actors' achieving autonomy.

In general, through their actions, participants seek structural transformations in their community in order to attain collective benefits. In several LA territories, participatory-action research has been used to influence public policy as well as to support socio-environmental innovation (Parra-Vázquez et al., 2010).

In practice, socio-academic groups act in innovation niches (Ingram, 2015) in social spaces suitable to trial-and-error under different development scenarios (or game rules). Innovation niches are sources of ideas, practices, and actions which defy the current regime and may catalyze transformation in specific territories (Ingram, 2015). Within processes of innovation, social learning and social production of knowledge play a fundamental role in social transformation (Ponce-Palma et al. Chap. 14, this volume).

1.1.2.5 Shifting from Disciplinary to Transdisciplinary Approaches

With respect to collaboration between researchers and one or more experts (indigenous and non-indigenous producers or other scholars), a continuum of approaches exists, ranging from disciplinary to transdisciplinary (Choi & Pak, 2006; Max-Neef, 2004, 2005; Said et al., 2019). Given that ecology, sociology, etc. have been developed as branches of knowledge (disciplines), they adopt discipline-specific tools and methods for solving their particular research problems.

We regard a multidisciplinary approach to research as collaboration (in a project, course, etc.) to solve a specific problem or reach a certain goal. However, if the

[3] Although in our LSES model, we generally regard members of both NGOs and research institutions as belonging to the same socio-academic group, in some territories members of global NGOs have assisted the political-economic group in implementing territorial regimes that benefit intermediaries and the market more than rural producers (see Chapin, 2004).

research problem to be solved has not been collectively agreed upon by participants, perceptions of the nature of the problem at hand may vary by discipline, and the results of such collaboration may not be integrated. A multidisciplinary approach is additive in the sense that despite drawing on knowledge from different disciplines, participants often fail to integrate their different concepts or theoretical assumptions, and therefore their results often fall within the borders of a specific discipline.

An interdisciplinary approach to research also involves collaboration, but is more complex than a multidisciplinary approach as it involves a deliberate attempt to combine components of various fields of knowledge to jointly solve the research problem at hand. Moreover, the problem to be solved as well as the methods are discussed and agreed upon by all participants. Such an approach may involve "bridging concepts" (Arce-Ibarra & Gastelú-Martínez, 2007) and "bridging methods," as well as bridging, synthesizing, deconstructing, and reconstructing parts of the research problem and the theoretical foundations of participating disciplines to come up with new solutions or a new understanding of the problem.

Lastly, the concept of transdisciplinarity is relatively new and therefore is not yet included in most standard dictionaries (Choi & Pak, 2006). A transdisciplinary approach is also collaborative and may contain all the elements mentioned above regarding interdisciplinary approaches. However, it transcends interdisciplinarity as it integrates several perspectives (e.g., emic and etic views) as well as peoples' local visions[4] and worldviews, and both popular and scientific knowledge. Therefore, some scholars suggest that transdisciplinarity involves a dialogue between academia and society (Lang et al., 2012), and—depending on the problem at hand—the government and the private sector may participate in this dialogue. Transdisciplinarity goes between, across, and beyond disciplines (Chuenpagdee & Jentoft, 2019). Nonetheless, Max-Neef (2005, p. 12) states that "transdisciplinarity in itself is still an unfinished project, around which there is still much to be discovered and investigated." At this stage, "it is both a tool and a project" (Max-Neef, 2005, p. 12). In summary, we consider that transdisciplinary approaches may be understood as a crossroads between scientific knowledge and social practices.

Although the literature provides several examples of developing and implementing transdisciplinary research approaches (Bourdieu, 2002; Max-Neef, 2005; Said et al., 2019), in our experience, contemporary social transformations in LA—especially those involving territorial resistance and struggles—require a particular path to transdisciplinary research. In such scenarios, in collaborative studies between academics and indigenous and other rural producers, the researchers generally have an understanding of the local context given that dialogue typically occurs between researchers and rural producers regarding local visions and needs. The next step after this dialogue is planning, developing, and implementing an ad hoc research

[4] In this chapter, local visions consist of people's subjectivities as well as a range of community and regionally based personal and family processes that—when faced with economic, social, and/or political impositions by national and international regimes—may or may not be capable of collaborating with socio-academic actors to develop niches of collective action in an attempt to attain life with dignity.