

Pierre Gasselin · Sylvie Lardon ·
Claire Cerdan · Salma Loudiyi ·
Denis Sautier *Editors*

Coexistence and Confrontation of Agricultural and Food Models

A New Paradigm of Territorial
Development?

Foreword by Jan Douwe van der Ploeg
With the Editorial Support of Sylvie Zasser

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Foreword: A Bold and Necessary Book

Agriculture and food production urgently need a transition towards a configuration that is more in line with both nature and society. Such a transition cannot but be radical, far-reaching, massive, global, multilevel and multidimensional. In particular, it will imply a reshuffling of power relations that is, at this time, hardly conceivable. The need for such a transition has been argued in convincing ways by many; there is no need to repeat their many solid arguments here.

At the same time, there is a dazzling array of questions about the possible modalities of this necessary transition. How to get it started? What will be its main mechanisms and driving forces? How will States, civil society and social movements align themselves (or not) during the transition? And, in particular, how to tie together the many small steps needed in order to achieve major moves forward? Questions like these abound, and the lack of adequate answers, even partial ones, can be discouraging.

The difficulty of arriving at answers that are adequate, as well as practically useful, resides not only in the fact that the transformation of agriculture and food production is yet to take place but also in the ineluctable awareness that the path to these answers will need to pass through unknown territories. Furthermore, there are two additional, probably interrelated, complications. First, there will not be a *single*, more or less well-delineated process of transition. There will be instead (as this book also shows) *several* partial and contrasting processes of transition that will enter into very complex, and probably unstable, interrelations. These partial processes of transition are already underway. Thus, today's agricultural sector is moving towards accelerated industrialisation and scaling up, and is undergoing a form of de-aggregation at the same time. These developments coexist with movements towards multifunctional agriculture and repeasantisation, understood as more peasant-oriented agriculture, as is happening in the field of agroecology. Such processes indeed often *coexist* alongside each other and simultaneously generate persistent confrontations. Any careful study of the local level (a basic necessity in agricultural studies) will reveal several incipient forms of transitional trajectories. This leads to the second major difficulty: the general direction of change is difficult to predict. As confusing as historical processes of transition might have been (e.g. the transition from sailing ships to

steamships), the overall direction of the process was known and understood. And, whilst this change was possibly contested, both those favouring it and those opposing it knew which way the winds were blowing. Even the ‘monstrosities’ created during the process, such as steamships that were equipped with masts and sails,¹ showed the way forward. This is a major difference with today’s situation.

The simultaneous occurrence of several partial and contrasting (if not competing and excluding) transitional processes is resulting in an often confusing and sometimes overwhelming heterogeneity. With *coexistence*, as it is aptly termed in this book, one sees a palette of diverse and parallel economies, forming a rainbow of many different colours, some of them miscible and maybe giving rise to new amazing colours, other combinations just becoming brown messes. The palette is not stable, it is changing constantly and always subject to influence—but nobody knows who is holding the brushes and palette knives. What we do know, however, is that this chaotic medley is the starting point for the transition(s) that we need. It is from here that we have to muddle forwards. *Inter alia* this book demonstrates this to be a sound methodological principle: studying the richly chequered coexistence of different forms and expressions, some old, others new, and trying to understand how the whole is moving forwards and simultaneously changing and what can we do to influence this for the better.

This ‘new’ coexistence, understood as melting pot of interacting and partly conflicting transitional trajectories, clearly differs from ‘old’ forms of coexistence, like the *minifundia* and *latifundia* that combined in one interdependent whole throughout Latin America. Or the plantations and small-scale native farms of South-east Asia, with the former having induced a structural decline in the latter. The same was true of the combination of large and small farms throughout Western Europe.

The oppositions between different actors can induce mutual reciprocity, overt hostility or both. There was, for instance, clear hostility in the *minifundia*–*latifundia* combination, but also a basic complementarity within this framework: small farms delivering labour (and sometimes food) to large farms, the owners of the latter defending, if needed, the small farmers (according to the patron–client model). There were exchanges and mutual dependencies, although their terms were constantly contested. This made for a negotiated complementarity. In Europe, there was complementarity as well (although its terms were different): small farmers cleaned the canals of the large farms, the large farmers serviced the small ones with their tractors and draught animals. Small farmers were slow to change (it was too risky), large farmers had the moral duty to innovate and pass on their findings to others, including to the small farmers. Needless to say, there was animosity and struggle as well: the weapons of the weak were never out of reach—but inside these ‘old’ forms of coexistence,

¹ Having both a steam engine and sails made these ships much more expensive, which is why they were called ‘monstrosities’. However, until the technological support structure was fully developed (with, e.g., the possibility to acquire sufficient coal at each port of call), this somewhat awkward, if not irrational, combination was unavoidable. Nonetheless, these ‘monstrosities’ made the overall direction of the transition very clear. Something comparable can be encountered in some of the ‘hybridities’ of today.

there was complementarity, sometimes more, sometimes less, but enough to hold the system together.

This differs fundamentally from the ‘new’ coexistence we are facing today. Now, there are many-stranded contradictions which translate into a strong degree of competition, if not in mutual exclusion. It is not a matter of competition in the neo-classical sense of the word, at the level of prices. Instead, it finds expression, above all, as a scramble for resources, a fight to appropriate the most promising symbols (‘healthy’, ‘sustainable’, ‘smart’, ‘strong’, ‘optimal’, etc.), and a struggle for privileged access to markets. The associated fights and struggles are, on the one hand, very much mediated through agricultural policies—they even take place through policy or the explicit lack of it—and, on the other hand, they deeply divide the farming populations, as attested recently by the outbreak of farmers’ populist protests.

In short: exploring the new coexistences is no easy task. This probably explains why most agricultural knowledge systems excel in avoiding this theme. In my country, for instance, there is a lot of easy talk about ‘transitions’, but any reference to the difficult coexistence as a starting point for such transitions is avoided, just as, consequently, the contested nature of the transitional process(es) is obscured. Thus, transition is suggested to be the smooth unfolding of new, comfortable realities—an unfolding that is governed by the logic of the markets and/or ‘unavoidable’ technological developments. Suspiciously, the State is often thought as having only a marginal role in the envisaged transitions.

Within this panorama, the French research community is a well-known and highly valuable exception. This book is a bold effort by some of this community’s most respected members. It reflects the strong international orientation of the agricultural sciences in France, their diversity, the spaces offered to diverging views, and the centrality of critical debates. It is a pleasure to scan the list of authors: anyone who has participated in international debates is sure to recognise several names. The book’s authors are acknowledged scholars with wide horizons and considerable interdisciplinary experience.

This book proposes four theoretical dimensions that allow for an exploration of the coexistence of and confrontation between different agricultural and food models. They are diversification (as opposed to specialisation), innovation, adaptation and transition. This exploration framework is then applied to a diverse set of empirical realities (ranging from Europe to South America, Polynesia to Asia and to Africa)² and culminates, through careful comparative analysis, at a set of highly relevant insights. The book is guided by a provocative hypothesis: it is the heterogeneity of agricultural and food systems (the ‘confrontational coexistence’ that they are part of) that strengthens their transitional capacity (and allows for meaningful theoretical elaboration). It is worth stressing that this hypothesis represents a strong contrast with the ‘proposals for transition’ advocated by dominant institutions. These latter proposals ignore the empirically existing heterogeneity for the most part (it is according to them, at best, irrelevant noise), whilst they focus on solutions located

² The book is based on 25 case studies. Some chapters provide a comparative analysis of several of them.

in (and derived from) the domain of a ‘world that does not yet exist’. Doing so is easy and their proposals often look well-polished and clean. This book, however, is radically different: it shows the value of *not* being afraid of the mud, the contestations, the doubts and the setbacks of the real world. Nor does it gloss over the many disparities that exist between different countries.

The main hypothesis is buttressed by specific ones that pertain to the specified theoretical dimensions. They avoid facile dualism and introduce differences of scale (spatial, temporary, social), variations in power relations, the dynamics of actor–structure relations, the changing nature of interrelations between past, present and future, and the mediating role of agricultural policies. Their application in the empirical chapters shows that processes of transition (including the partial and as-yet-unfinished ones) are full of surprises. Transitional processes hardly ever follow the straightforward logic that modernisation theories entail. The initially marginal sometimes becomes the source of far-reaching and radical changes, whilst the strong and powerful often have to step back in order to engage in uneasy, hybrid configurations. Reciprocal cause–effect relations are more common than one-way patterns that run from clear causes to well-outlined outcomes. All this makes the empirical (and theoretically well-grounded) exploration of transitions of agricultural and food systems into an extraordinary intellectual adventure. This book demonstrates that such an adventure is far from easy—it requires courage. But by carrying out this bold enterprise and by including a thorough rethinking of the concepts of quality, agency, innovation, etc., it provides the instruments necessary to forge ongoing processes of transition into successful historical events.

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Preface to the English Edition

This English volume is the translation of the original French edition published by Quæ in 2021: *Coexistence et confrontation des modèles agricoles et alimentaires. Un nouveau paradigme du développement territorial?*

This book presents the results of the Format project ‘Combining forms of agriculture and food systems at different territorial scales: coexistence, confrontation or hybridisation of models’, funded between 2015 and 2017 by the interdisciplinary GloFoodS metaprogramme ‘Transitions for global food security’ created by INRA and CIRAD, the two leading French agricultural research institutes.

This book would not have been possible without the support and funding of INRAE’s Action and Transitions Division and CIRAD’s Environments and Societies Department, as well as of the Innovation Joint Research Unit (Montpellier) and the Territories Joint Research Unit (Clermont-Ferrand).

Thirty-six authors from France and other countries (Argentina, Belgium, Brazil, Burkina Faso, Japan, Switzerland, Vietnam) have contributed to the book. Jan Douwe van der Ploeg has done us the honour of writing the foreword.

The text underwent a demanding evaluation process, both in terms of content and form: each chapter was proofread and corrected at least four times, by an external expert in the relevant topic, by one of the scientific coordinators, by Sylvie Zasser (editor at INRAE’s Action and Transitions Division) and finally by Juliette Blanchet (proof-reader). In addition, Valérie Mary from Quæ publishers was responsible for editorial coordination.

We would like, in particular, to mention the quality and rigour of Sylvie Zasser’s editorial supervision. She worked tirelessly and patiently to help improve the quality of the various texts and ensured the book’s timely publication.

To each of these institutions and individuals, who have contributed to make the book a success, we express our heartfelt thanks.

In addition, the coordinators would like to extend special thanks to the book’s translator, Kim Agrawal, for his commitment, his uncompromising exactitude and attention to detail, and his unceasing desire to get at the true meaning of words and ideas.

A first version of the translation of each chapter was submitted to its authors for validation and modifications. Final decisions were taken in consultation with Pierre Gasselin and the translator.

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Saint Pierre, France
Lempdes, France
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General Introduction. Questions, Issues and Analytical Framework

Pierre Gasselin, Sylvie Lardon, Claire Cerdan, Salma Loudiyi and Denis Sautier

The issue of the coexistence and confrontation of agricultural and food models is a topic that is preoccupying society and political and professional fields. In some countries, such as Brazil (Sencébé et al., 2020) and to a lesser extent Argentina (Albaladejo, 2020) or Vietnam (Duteurtre et al., 2015), agricultural development is based on models of dual social and technical forms of agriculture, with one being described as family-based or peasant-based farming (Bosc et al., 2018), and the other as industrial or corporate farming (Purseigle et al., 2017) or as an agribusiness. In France, the history and structures of agricultural production, exchange, innovation and regulation have led to less assertive or more gradual agricultural and food models (Deverre & Lamine, 2010; Hervieu & Purseigle, 2013; Gasselin et al., 2014). Agricultural and food models are sometimes expressed in terms of development issues, such as the right to food, which is embodied in the ‘food sovereignty’ project (Rosset, 2003; Jarosz, 2014), or climate change, which has given rise to so-called climate-smart agriculture (Caron, 2016; Karlsson et al., 2018; Oui & Touzard, 2018; Taylor, 2018). These models can also be defined in terms of technical modalities (e.g. conservation agriculture, precision agriculture or permaculture), marketing of products (short supply chains, fair trade, etc.), social forms of organisation of labour and capital (family farming, corporate farming, etc.) or socio-spatial configurations (e.g. urban farming). These agricultural and food models underpin not only forms of public action, agri-chain structures, but also configurations of territorial development, which we examine in particular in this book. The sociotechnical controversies within each of these models and between them shape alliances and confrontations between actors and ideas.

For several years now, the research community has been focusing on this issue of coexistence and confrontation of agricultural and food models, whether in France (Petit et al., 2018) or elsewhere (Argentina, Brazil, USA, Netherlands, Japan, Belgium, etc.). It provides a research agenda whose elements, preoccupations and objectives need to be refined and structured within an international research community that is itself under construction. This collaborative book is one of the first collective scientific endeavours on this topic. It is intended for researchers, teachers, students and, more broadly, all those who are involved in territorial development:

individuals (development officials, elected officials, journalists, etc.) as well as institutions (associations, local authorities, cooperatives, chambers of agriculture, government departments, etc.).

This introduction first discusses the different acceptations of the concept of the agricultural and food model. We then recall the key facts of the differentiation of agricultural and food models since the Second World War—which justifies the current interest in their coexistence and confrontation. We then proceed to characterise the major elements of the situations of coexistence of models studied in this book. Finally, we present the research and development challenges, followed by the scientific issues and the analytical framework we have used to organise the book.

The Model: Analytical Archetype, Desired Future or Standard for Action

The sociotechnical³ and socio-ecological⁴ forms observed in agriculture and food systems often differ from what are known as ‘models’, which are abstract, schematic and simplified representations that actors (researchers, agricultural advisors, trade unionists, elected politicians, etc.) make of a complex reality. The scientific literature uses three acceptations of the concept of agricultural or food model.⁵ First, researchers and experts construct models as archetypes of a reality observed either today or in the past in order to characterise its diversity and facilitate its understanding for transformative action. These models are often described in terms of regimes (Wiskerke & van der Ploeg, 2004; McMichael, 2009), frames of reference (Muller, 1990; Gisclard & Allaire, 2012, Hall et al., 2015), styles (van der Ploeg, 2010; 2012), agricultural systems (Plumecocq et al., 2018), food systems (Sobal et al., 1998; Fournier & Touzard, 2014), sociotechnical systems (Geels, 2010; Darnhofer, 2015), etc. Second, an agricultural and food model can also be a desired future that actors demand, such as the peasant agriculture advocated by agricultural unionism or the alternative forms of consumption promoted by movements such as ‘slow food’⁶. Third and finally, a model is sometimes defined as a set of standards for action in a certification and assessment process, such as organic farming or halal or kosher food. Some researchers mobilise the concept of agricultural or food model by combining these three meanings (Albaladejo, 2020). However, models always have, on the one hand, an analytical dimension and, on the other, a normative dimension that actors

³ Sociotechnical forms combine human representations, decisions and practices with biotechnical entities (Bijker, 1997).

⁴ Socio-ecological forms refer to the way in which ecological dimensions interact with sociotechnical dynamics (Holling, 2001).

⁵ We do not consider here models defined as mathematical formalisms which relate variables embedded in descriptive, normative or predictive explanatory equations that deal with food and/or agriculture.

⁶ International movement to raise awareness of eco-gastronomy and responsible consumption, as a reaction and opposition to fast food.

use to think and act. These two facets are in tension and must be clearly laid out, for example to show that the peasant agriculture of Mendras (1967), an analytical archetype, is not the peasant agriculture of the Confédération Paysanne (a major French farmers' union), which represents a desired future. As we will see below, an agricultural and food model refers to an overall coherence of the relationships that humans establish with activity, nature, techniques, knowledge, the State, markets and the territory (Gasselin, 2019). Furthermore, the concept of a model presupposes that a group of actors builds a minimal consensus to make it a collective reference, to be defended or criticised.

Differentiation and Diversity of Agricultural and Food Models

Why should we take an interest in the coexistence and confrontation of agricultural and food models at the territorial scale? A first reason to do so is that after several decades of public policies that encouraged their homogenisation, we have to admit that these models continue to diversify. Indeed, globalisation has not succeeded in standardising agricultural and food models, despite their spread across the planet, for example during the Green Revolution (Pingali, 2012); the industrialisation⁷ of agricultural production, processing and distribution; or even the affirmation of agroecology as a shared horizon (Pimbert, 2018).

The main determinants of the differentiation of agricultural and food models have been known for some time (McMichael, 2009; Hervieu & Purseigle, 2011; IPES-Food, 2016; Allaire & Daviron, 2017; Gaitán-Cremaschi et al., 2019). To begin with, they include the massive intensification of commodity and capital flows, and major technical transformations, in particular those based on new genetic selection regimes (fixed varieties, GMOs, etc.) and the use of chemical inputs and fossil fuels (Daviron, 2019). Urbanisation, the concentration of production, processing and distribution

⁷ The definition of the industrialisation of agriculture most often refers to that of conventional agriculture (Bernard de Raymond & Goulet, 2014; Galliano et al., 2017). Historians (Malassis, 1997; Mazoyer & Roudart, 1997; Daviron, 2019) situate industrial agriculture in the great movement of the industrialisation of economies with the use of non-renewable natural resources (coal for the steam engine, then later oil and phosphates). Thus, agricultural systems with technical itineraries based on fertilisers, phytosanitary products, heavy mechanisation and non-renewable energy sources are considered industrial, even if the labour is family-based. Another perspective defines an agricultural system as industrial when it serves agro-industry, irrespective of the forms of contractualisation that bind them (cooperativism, vertical integration, etc.). In this case, the industrial character refers to the nature and structure of the downstream agri-chain, and to the forms of organisation of work and the organisation of the capital of processing, distribution and catering companies. The industrial character can also refer to the idea that agricultural enterprises base their technical-economic rationales on economies of scale (division of labour, specialisation of tasks, standardised and mass production). This organisation of production aims to maximise labour productivity, which is best achieved in large-scale production units.

structures and new food demands, supported by public policies promoting international trade and lower food prices, have also favoured the industrialisation of agriculture and food systems. This consists of the production of low-priced and standardised-quality food for mass markets, using inputs that are themselves industrial and relying on economies of scale and regional agricultural specialisation. The industrialisation of agriculture and food systems is taking place across the entire planet and is dominant in terms of the quantities produced and of the balance of power between actors in food systems. Nevertheless, it has not wiped out certain peasant and artisanal forms that have transformed themselves to face new contexts, nor has it prevented the appearance of new forms of agriculture and food systems such as permaculture or the slow food movement (Hervieu & Purseigle, 2015).

This industrialisation is showing its limits in many respects (IPES-Food, 2016). Despite the growth in per-capita food production and high labour productivity, the industrial food system generates major environmental problems (soil, water and air pollution, greenhouse gases, soil erosion, loss of domestic and wild biodiversity, weeds resistant to bio-aggressors, deforestation, etc.), spatial problems (increase in cultivated areas, land grabbing, etc.), economic problems (poverty, reduction in the availability of jobs, precarious incomes, dependence on and cost of chemical inputs, volatility in prices of inputs and products, etc.), social problems (hunger and malnutrition, infringement of human and workers' rights, land conflicts, loss of knowledge and know-how, animal suffering, etc.) and health problems (producers exposed to pesticides, consumers subject to pollution, zoonoses, non-communicable food-borne diseases, etc.). Through its negative externalities, the industrial food system compromises food and nutritional security, the sustainability of ecosystems, social justice and responses to climate change. In addition, this industrial food system exhibits a high degree of vulnerability, especially due to the genetic uniformity of monocultures and livestock, and the low productivity and insufficient food autonomy of certain regions (Fraser et al., 2005; Hodbod & Eakin, 2015; Urruty et al., 2016).

In response to these shortcomings of 'modernisation' and to new development challenges, a host of proposals are emerging from research, empirical practices, social movements and public policy (Deverre & Lamine, 2010; Horlings & Marsden, 2011; van der Ploeg & Ventura, 2014; Caron et al., 2018; van der Ploeg, 2018; Gaitán-Cremaschi et al., 2019; HLPE, 2019). These 'alternatives' have long remained marginalised not only in science, public policy and the media, but also in markets and professional spheres. However, contemporary history is marked by a succession of food, environmental, climatic and health crises that keep reminding us of the urgency of finding solutions to the failures of industrial food systems. Gradually, certain 'alternative'⁸ models are gaining recognition: organic farming, agroecology, local food, veganism, etc. They are now tolerated and sometimes even promoted as a response

⁸ The concept of 'alternative' lacks a stable and accepted definition. It can refer to the existence of a social movement engaged in a political conflict (Pelenc et al., 2019) or in demands for justice, to actors' projects (Le Velly, 2015), to niches of innovation on the fringes of the sociotechnical system inherited from history, to a low level of institutionalisation, to marginality (social, economic, spatial, etc.), etc.

to the limitations of conventional models and to new challenges (health, environmental, food, demographic, etc.) (Beus & Dunlap, 1990). This positive reassessment of the alternative has been taking place since the 1990s in a ‘quality turn’ through which new qualifications in agriculture and food systems are emerging (organic, fair trade, geographical indications, vegan, etc.) (Goodman, 2003). These many and different agricultural and food models, sometimes inherited from agricultural revolutions (Mazoyer & Roudart, 1997; Regnault et al., 2012), are often examined in a dual way in a binary opposition to the model from which they diverge (conventional vs alternative, agro-industrial vs peasant, GMO vs non-GMO, modern vs traditional, *latifundium* vs *minifundium*, etc.). However, this dualism obscures the great diversity of agricultural and food models, and of their territorial interactions—which we discuss in this book.

Research and Territorial Development Challenges

Thus, researchers, statistical institutions and development entities have long been attempting to characterise the differentiation and diversity of forms of agriculture and food systems (Chayanov, 2019 [1927]; Colson, 1986; Mazoyer & Roudart, 1997). Some researchers have analysed the different currents of theoretical thought that form the basis of this substantial collection of work (Hervieu & Purseigle, 2013; van der Ploeg, 2018). In the same vein, there is no shortage of comparisons of the performance of agricultural and food models (Seufert et al., 2012; Dumont & Baret, 2017; Muller et al., 2017), making room for a wide variety of postures and methods, which could be multi-criteria, multi-scale, scenario- or modelling-based, meta-analysis based and/or participatory in nature (Binder et al., 2010; Talukder & Blay-Palmer, 2017). In contrast, studies that examine the conditions and effects of interactions between actors and systems of different agricultural models are less common.⁹ Yet, in view of recent history, the heterogeneity of our agricultural and food worlds¹⁰ and their interconnectedness compel us to analyse and govern situations of coexistence and confrontation of agricultural and food models. The main research in this area has so far focused on the coexistence of GMO and non-GMO farming (Jank et al., 2006; Hubbard & Hassanein, 2013; Kalaitzandonakes et al., 2016), primarily around biotechnical and ecological issues. However, many researchers in the human and social sciences have recently become interested in the issues of coexistence of agricultural and food models (Deléage & Sabin, 2012; Hervieu & Purseigle, 2015; Albaladejo, 2016; Loring, 2016; Goulet & Giordano, 2017; Cayre et al., 2018; Chia & Dulcire, 2019; van den Berg et al., 2019; Aubert et al., 2020; Gasselin et al., 2020). Also noteworthy is a recent special issue of the Review of Agricultural, Food and

⁹ This book does not present a systematic review of the literature on the coexistence and confrontation of agricultural and food models.

¹⁰ Heterogeneity of access to resources and wealth, of actors’ practices and projects, of socio-political and economic regulations, etc. (Jollivet & Lepart, 1992; van der Ploeg & Ventura, 2014).

Environmental Studies (Gasselin & Hostiou, 2020), bringing together ten articles on these issues.

In addition to characterising the diversity of agricultural and food models and assessing their relative performance, it is also essential for us to understand their interactions within territories¹¹. Indeed, these interactions are intrinsic to territorial development, which we define as an increase in the actors' capacity to control the processes and activities that concern them in their territory, including agriculture and food production (Deffontaines et al., 2001). These activities pertain to all the actors concerned by a territory, across all sectors (Lardon et al., 2015; Torre, 2015). The interactions between models are at the heart of territorial development processes and strategies and open up the field of possibilities. They can take various forms and be combined: copresence, cohabitation, complementarities, synergies, coevolutions, hybridisations and/or confrontations, competitions, marginalisations and exclusions. It is to remove any ambiguity, and to remind us that these interactions are often not peaceful or positive, that this book is entitled 'Coexistence and confrontation of agricultural and food models'.

Our ambition is thus to contribute, through this book, to an improved understanding of the conditions under which the coexistence of agricultural and food models is conducive to sustainable territorial development. We will, however, not undertake a comprehensive, critical and structured discussion on sustainable development of agriculture, food systems or territories (Godard, 1994, 2005; Laganier et al., 2002; Agrimonde, 2009; Esnouf et al., 2011; Zahm et al., 2015; FAO, 2018). We perceive sustainable development in a triple dimension—without claiming to find answers to the political and scientific debates surrounding this concept. First, sustainable development is a capacity to continue to exist whilst taking future generations and uncertainties into account (which refers to the concept of emergent properties of agricultural and food systems, especially resilience). Second, it is an ideological alternative to the industrial agricultural and food model. And, third, it is a combination of ecologically sustainable, economically viable, socially acceptable, and ethically equitable goals. Each of the alternative agricultural or food model embodies a particular vision of this sustainable development.

In this book, we pay attention to controversies and to situations that generate effects that are detrimental to the environment, social justice, the economy or the health of humans, plants or animals (Habte & Krawinkel, 2015; Lindgren et al., 2018). In particular, we examine situations at the margins of the institutionalisation of conventional or alternative models (Bellon & Ollivier, 2018), whether this takes place in science, the market or public policy. In subjecting the coexistence and confrontation of models to scrutiny, we also intend to inform professional and political debates by investigating the sociotechnical controversies through which these models assert themselves and oppose each other.

Thus, this book first of all tests and combines the theoretical frameworks through which agricultural and food models and their coexistence and their confrontations are

¹¹ In the heritage of French geography, we conceive the territory through the ideal, organisational and material links that are established between societies and their spaces (Lévy & Lussault, 2013).

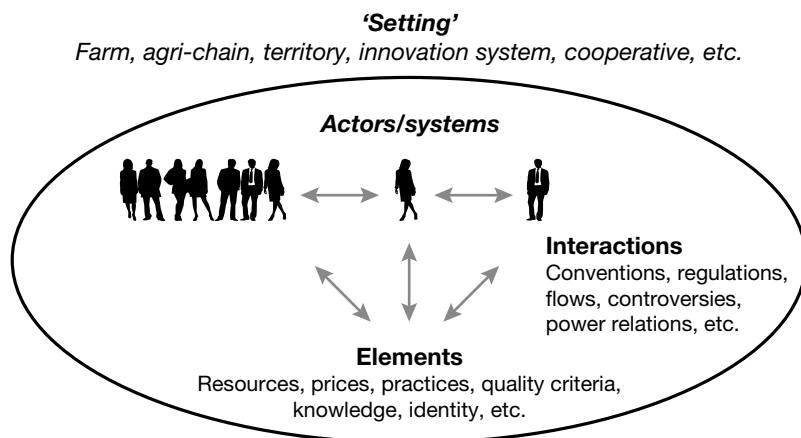


Fig. 1 Situation of coexistence and confrontation of agricultural and food models

constructed and analysed. In doing so, the studies presented highlight the plurality of agricultural and food forms and of their relationships in order to go beyond dual readings. Second, through their investigations, the book's contributors shed light on these models' domains of coherence and major underlying dimensions: technical paradigms, ecological functionalities, relationships with nature, organisation of work, forms of food consumption, etc. We test the hypotheses according to which the diversity of agricultural and food models, and their interactions, confer, under certain conditions, capacities for the diversification, innovation, adaptation or transition of food systems. Finally, we determine the conditions and tools necessary for a territorial governance of the coexistence of agricultural and food models in a perspective of sustainable development of territories and food systems.

Situations of Coexistence

The term coexistence, first used in the 16th century, derives from the Latin *coexistere*, which means 'to exist together'. Dictionaries (Oxford, Websters, Wiktionary, etc.) all list the meaning of coexistence as 'the state of existing together in the same place at the same time'. Its synonyms include contemporaneity, concomitance, coincidence, simultaneity, copresence and cohabitation. In political vocabulary, coexistence can become 'peaceful' when this adjective is attached to it—which presupposes that it is not necessarily so. In ecology, coexistence refers to various interactions between species in an ecosystem: symbiosis, mutualism, commensalism, neutralism, parasitism, etc. Not all of these interactions are always positive.

Before we can consider a 'situation of coexistence' of agricultural and food models (Fig. 1), we have to specify which actors or systems are interacting (producers, production systems, actors in a territory or agri-chain, etc.) and in which 'settings'

or frameworks of interaction (a farm, a cooperative, a territory, an agri-chain, an innovation system, a governance system, etc.). It is also necessary to examine how they interact (conventions, regulations, flows of materials or money, controversies, power relations, etc.) and around which elements (work, technical systems, prices, natural resources, quality criteria, knowledge, identity, etc.).

Situations of coexistence are indeed observed differently at the scale of a farm, a cooperative, a territory or a nation: situations that are ‘virtuous’ at some scales may not be so at others. Similarly, the issues of coexistence vary according to the problem being addressed. For example, in a given territory, the issue of coexistence may concern the question of competition over resources, but it may also concern the construction of a territorial identity.

A Framework for Analysis and a General Research Issue

This book presents the results of the Format project, funded by the INRA-CIRAD GloFoodS metaprogramme (2015–2017), whose aim was to study combinations of forms of agriculture and food systems at different territorial scales. Some 50 researchers¹² addressed this issue during a series of six seminars that allowed for the analysis of 19 case studies¹³. These seminars concluded with an international symposium (June 2017) and a session of the Living Territories symposium (January 2018). The Format project was part of the ‘Coexistence and confrontation of agricultural and food models’ Scientific Priority of INRA’s Science for Action and Development (SAD) division (2016–2020)¹⁴.

The Format seminars revealed that the coexistence and confrontation of agricultural and food models in a territory both determine and depend on the following four major questions: What are the tensions between specialisation (of production and/or of spaces) and diversification? Is innovation the driving force and/or the product of the coexistence of territorial agricultural and food models? What are the conditions that are suitable for the adaptation of agricultural and food systems in a context of uncertainty? Are the sustainability transition approaches appropriate for designing and supporting situations of coexistence of territorial agricultural and food models? These four dimensions (diversification/specialisation, innovation, adaptation, transition) are addressed in a dynamic way, as processes. They are considered both as

¹² These researchers, mainly from the human and social sciences, are affiliated to 13 research and higher education institutions in France (AgroParisTech, CIRAD, CNRS, INRA, IRSTEA, Montpellier SupAgro, VetAgro Sup), Argentina (INTA), Belgium (Catholic University of Louvain), Brazil (Instituto Ambiental do Paraná), Japan (Aichi Gakuin University of Nagoya), Portugal (University of Évora) and Switzerland (University of Neuchâtel).

¹³ Seven cases from Europe, six from South America, three from Africa, two from Asia and an international comparative approach concerning seven milksheds.

¹⁴ In January 2020, INRA became INRAE—the French National Research Institute for Agriculture, Food and Environment—and the SAD division became the ‘Action and Transitions’ (ACT) division.

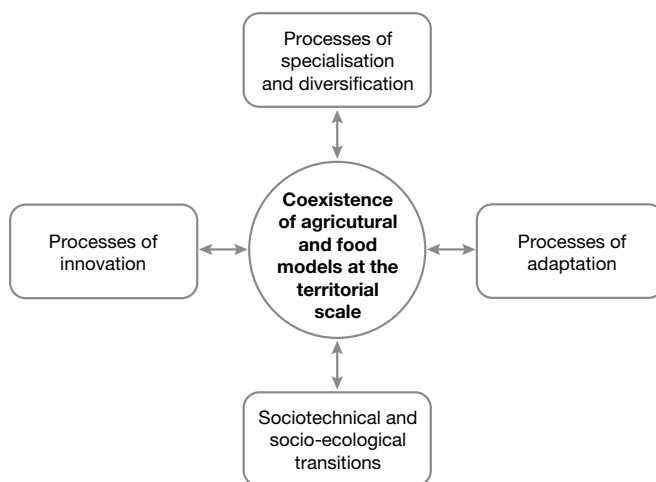


Fig. 2 Framework for analysing the coexistence of agricultural and food models. *Source* Gasselin et al., 2020

factors and as outputs of the dynamics at work in the coexistence and confrontation of territorial agricultural and food models.

These four dimensions (Fig. 2), identified at the end of the Format seminars, echo the focal points of research in the human and social sciences on territorial development during four successive periods (Pike et al., 2006; Jean, 2008; Torre, 2015): specialisation since the 1980s, innovation since the 1990s, adaptation since the 2000s, and transition since the 2010s (Gasselin et al., 2020).

In addition to examining these four dimensions in some detail, this book offers a critical perspective by questioning the relevance of the very notion of the agricultural and food model, by examining how models assert themselves and analysing their coexistence at the territorial scale, and by discussing whether and how these situations of coexistence and confrontation reshape thinking on territorial development.

The Structure of the Book

This book is organised in five parts. The first four parts examine situations of coexistence according to the four dimensions of the analytical framework presented above. Each of these parts is organised as follows:

- An introduction provides a brief overview of the state of the art¹⁵ on the dimension concerned, before proposing some major hypotheses pertaining to the situations of coexistence and confrontation of territorial agricultural and food models. This introductory chapter then presents a summary of the other chapters in the part, followed by a transversal analysis of these contributions;
- Two or three case studies follow, corresponding to specific territories. Each of these case studies formed the topic of a presentation extensively discussed by the Format seminar's participants. An audio or video recording of each session was made, and a report and a transcript of the exchanges were subsequently produced. This material enabled the authors to write their chapter, which was then revised by one or two of the book's scientific editors, an external reviewer and Sylvie Zasser, who was in charge of editorial follow-up;
- Each of the first four parts (except for the second on Innovation) concludes with a 'panoramic' analysis. These chapters of different types (theoretical perspective, comparative analysis, position paper) are original contributions on each of the dimensions considered.

The book's fifth part is divided into two sections. The first gives the floor to three researchers (Jérémie Forney, Kae Sekine and Gilles Allaire) we invited to present situations of coexistence that illustrate contrasting perspectives on territorial development. The second section is divided into two chapters, the first by Ronan Le Velly, the second by Patrick Caron, who were requested to provide a personal reflection and cast a critical look at the entire book. We conclude by examining the title of the book: Do the coexistence and confrontation of agricultural and food models open the way to a new paradigm of territorial development?

With this book, we intend to show that taking the coexistence and confrontation of agricultural and food models into account enriches the conceptual apparatus necessary to analyse and support agricultural and food development in rural and urban territories. These contributions also offer a broad panorama of situations of coexistence around the world, in Europe (France (five cases), Italy and Switzerland), South America (Argentina and Brazil (two cases)), East and South-east Asia (Japan, Vietnam), Burkina Faso and two international comparative approaches. They constitute an analytical framework and a research agenda, the first results of which we present here. We hope readers find this book rewarding and enriching.

¹⁵ The literature review was carried out by querying 4 scientific documentary databases (Web of Science, Agritrop, Prodinra, HAL) using queries adapted to each of them. As an illustration, these were the queries used for Web of Science: TS = (((intensive or conventional or "high input" or monofunctional or industrial or commercial) near/3 (organic or "low input" or integrated or ecological or familial or multifunctional or sustainable or agroecology))) near/3 (((farm or farming or agricultur* or crop or food or agri\$food or livestock) near/3 (system or model))). The bibliographic material is also based on the expertise of each of the coauthors, who selected the articles which seemed most relevant to them.

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