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The activity system. A position paper

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Abstract: From a broad review of the literature and empirical studies conducted in Latin America and in France, we consolidate the concept of activity system applied to small-scale agriculture. This concept brings together fundamental works of various disciplines on the notions of activity, work, knowledge, resources, decision-making and rationality, dynamic of systems, innovation and development. It provides a global analytical framework that can be applied to a specific context and a given issue. This in turn imposes to define its components (social entity, activity, motivation and resources) and its environment. The study of the interactions and of the dynamics, especially in its historical dimension, is intrinsic to the activity system approach.

1. Introduction¹

Worldwide, many authors emphasize the importance of combinations of activities in and around agricultural activity (Ellis, 2000 ; De Janvry et al., 2005 ; Malezieux & Moustier, 2005 ; Hagglblade et al., 2007) even in countries known to have led the process of agricultural specialization. The observation of the diversification of productions and activities involves many cognitive, political and operational stakes. Analytical tools should allow describing and understanding these complex realities. At the same time, it is necessary to develop policies and engineering tools to deal with and support social and technical changes. Facing this dual challenge, we consolidate the conceptual framework of activity systems in order to study and support the practices and decisions of social entities at the micro-scale (individual, household, family, small firm, small group of individuals, etc.) who implement at least one farming activity (crop and / or animal). After a theoretical and empirical positioning, we present the concept of activity system and its conditions of use.

2. Theoretical and empirical roots

The theoretical foundations of the concept of activity system include many fields of research, particularly on agriculture and rural development, and a wide range of topics such as the systemic approach, resources, processes of action and individual decision-making, collective action, activity and labor, innovation and development. The second part of this section presents the main issues of the five research operations in which the concept of activity system was mobilized.

2.1. Main theoretical filiations

We subscribe to the legacy of systems thinking (Crozier & Friedberg, 1977 ; Morin, 1990) applied to agricultural and rural issues (Brossier et al., 1990 ; Sebillotte, 1996 ; Norman, 2002 ; Cochet, 2011). Several authors apprehend the combination of activities in a systems approach (Chayanov, 1990 ; Curie et al., 1990 ; Aubry, 2007 ; Mundler, 2007 ; Gaillard & Sourisseau, 2009) recognizing that "this meta-system which we call activity system is the real field of consistency of practices

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and farmers' choices" (Paul et al., 1994). Admitting the systemic nature of the combination of activities leads to identify its emerging properties (the combination of activities is more than the simple sum of activities) and to carefully examine the interactions between activities, but also between the resources mobilized and between the system and its environment.

We take for granted that the social entity of the activity system has a poly-rationality, subjectivity and intentionality according to theories of action and decision-making that solve sociological oppositions such as "structure / agency ". The actor of the activity system (his decisions and practices) is not entirely determined by the upper structures and institutions (holism and structuralism of Durkheim), nor is he either a fully and freely rational creator of his own activities (methodological individualism inherited of Weber). Many authors of the social sciences and techniques inspire our works on decision-making and practices such as Bourdieu (1980) and Boltanski and Chiapello (1999). We also rely on some more specialized authors in the field of agriculture such as Osty (1978), Brossier *et al.* (1990), Darré (1999) and Fiorelli (2010).

The activity system is an abstract, simplified and schematic representation of the combination of activities actually implemented by a social entity. Defining the meaning of "activity(ies)" is therefore essential to study it. Several theories underpin our conceptions of human activity. We adopt in particular the theories of Hannah Arendt (1994) who distinguishes three basic dimensions: (1) the "Labor" dimension, which is the economic and domestic life (satisfying the needs), (2) the "Work" dimension, which is the personal creation (creating a common world and usual objects more than consumption ones), and (3) the "Action" dimension, which represents the political and associative lives in the public space. Many researches on labor, which may not be confused with the activity or task, have also been mobilized, and specifically works inspired by Christophe Dejours. He specifies the subjective dimension of labor acknowledging that "labor is about mobilizing one's body, one's intelligence, one's person, for a production with use value" (Dejours, 1998). Agricultural activity is of course recognized in its multifunctionality (Caron et al., 2008). Like other types of activity, it does not only create market values.

To decide and conduct an activity requires resources. Some major authors guide our thinking about resources of the activity system, in particular Boserup (1970) and her explanation of the historical evolution of the agricultural techniques, Polanyi (1983) and his social approach of the exchange which is not only the fact of the market or the State, Mazoyer and Roudard (1997) and the theory of agrarian systems, Gumuchian and Pecqueur (2007) and their approach of territorial resources, Sen (2008) with the concept of capability and his contributions to the theory of the personal choice, and Ostrom (2010) who gave us criteria to think collective action in the management of common pool resources. The activity system is a part of socio-economic and anthropological thoughts recognizing that the social entity has commercial and non-commercial resources, some are latent (not immediately available or not mobilized in the activity), other activated (directly available for action and decision).

2.2. Empirical works

We mobilized the same concept of activity system on study areas as diverse as the Argentine pampas (Gasselin, 2009 ; Albaladejo et al., 2011), the region of Salars in the Bolivian Andes (Gasselin & Vaillant, 2010), the Andes in southern Ecuador (Vaillant, 2008), western Guatemala (Bathfield et al., 2010) and the Languedoc-Roussillon region in France (Terrier et al., 2010 ; Gasselin, 2011 ; 2012). These five research operations conducted since 2006 (see Tab. 1) have permitted cross-collaborations and comparative works within the framework of research projects and PhD theses. In the following sections, they illustrate various ways to mobilize the concept.

Table 1. The components of the activity system, seen for each study area in function of a primary research question

Study area	Research question	Context elements	Social entity	Activities	Available Resources	Motivations
Argentina (Pampa)	What are the adaptive capacities of Pampean smallholder households?	History on the long-run; major territorial, technical and sectorial changes, due to "sojization"; social, political and market uncertainties.	The individual through his biography on the long-run	Activities creating goods and services which may be traded on a market or not; socialization activities.	All, with a focus on the skills, networks and access to land	Economic, relational (with people), identity (relative to trade and profession), technical
Bolivia (Andean region of Salars)	What are the consequences of the emergence of quinoa in global trade on agricultural and social sustainability?	History on the long-run; soaring prices; climate hazards; public and private interventions; producer organizations.	Nuclear family, always multi-localized	Localized activities creating goods and services which may be traded on a market or not; university.	All, with a focus on material (equipment, tools); community integration; skills and access to land.	Economic; relational (between people); identity (relationship with the territory and ethnic and cultural heritage).
Ecuador (Upper Andean valley of Cañar)	What are the causes of emigration and its consequences on the agricultural practices of farmers?	History on the long-run (colonial heritage, crises of the twentieth century, emigration); migration policies of destination countries.	Transnational family	Localized activities creating goods and services which may be traded on a market or not.	Natural; human (amount of work); physical; financial; social. A focus on the relationship to space.	Economic, relational (between people)
Guatemala (Mexican border of the department of Huehuetenango)	How and why do technical practices change in the coffee plantations of small coffee producers and honey in a context of volatility of the coffee market?	Coffee market volatility; farmers' cooperative; social and political dimensions of the local area; the coffee and honey industries.	Nuclear family, sometimes multi-localized (city or countryside, Guatemala or United States)	Localized activities creating goods and services which may be traded on a market or not; university; major festive activities.	Naturals (land, biodiversity of shade); material (tools); human (amount of work); financial; social (collective action).	Economic; relational (between people); identity (relationship to the place).
France (Languedoc - Roussillon)	How to support the transformations of activity systems of pluriactive farm households embedded in their territories?	Wine crisis; unemployment; national and regional policies to support agriculture in the farming installation and creation of activities.	Individuals or households with a project of creation or development of activities.	Localized activities creating goods and services which may be traded on a market or not, with attention paid to territorial dimensions. Associative and political activities.	All, with a focus on the skills, networks, public aid, the territorial resources and access to land.	All, with attention to non-economic registers (axiological, relational, identity, bodily involvement, technical, aesthetic).

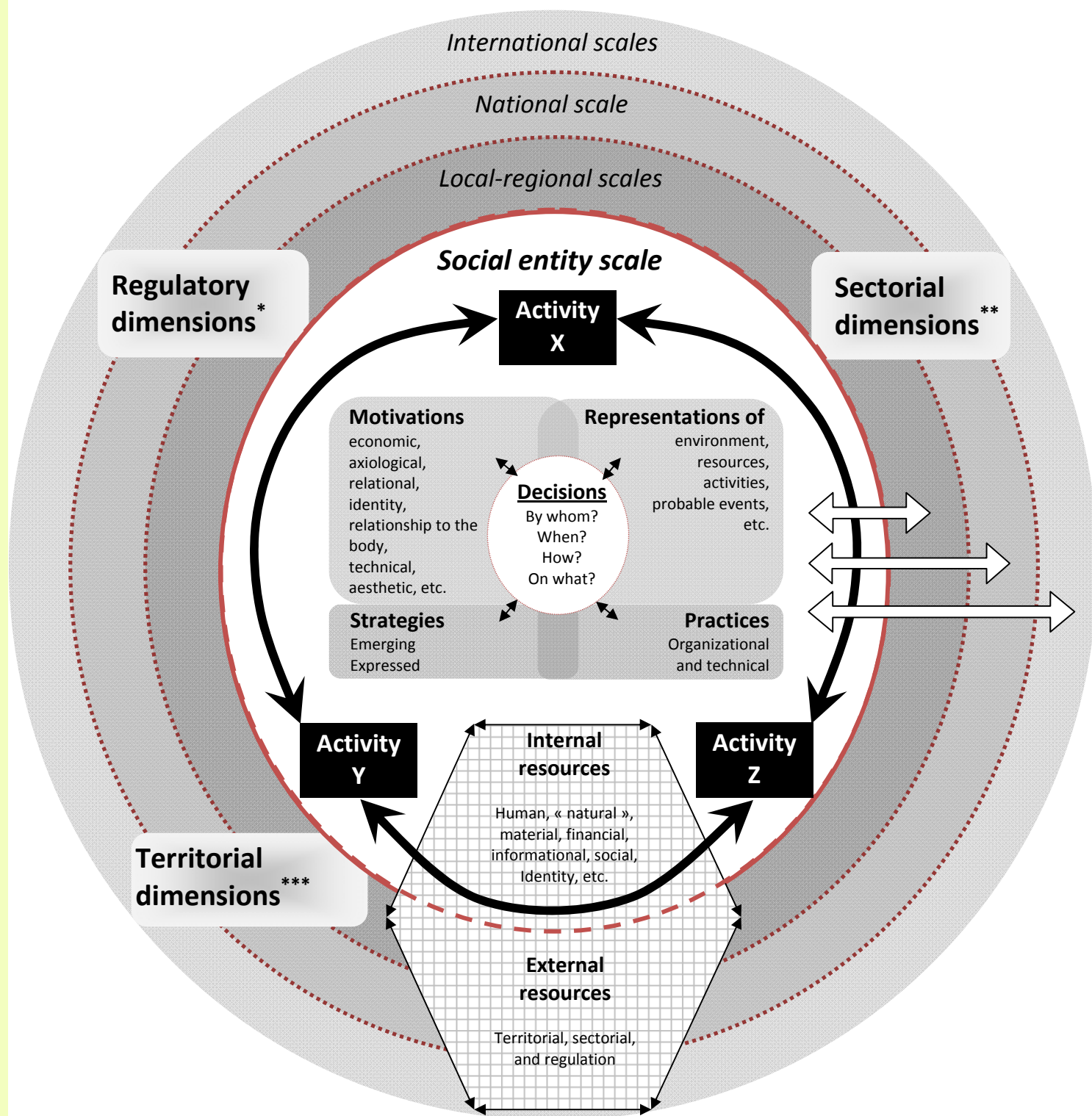
3. Concept

3.1. Definition

The activity system is a polysemous and transdisciplinary concept used among others in chemistry, epidemiology, history and economics. In the agricultural and rural field, it was however very rarely worked on since the article of Cellier & Marquié (1980). We define the activity system as a dynamic and structured set of interacting activities carried out by a social entity who mobilizes available resources in an agro-ecological (ecological, agronomical, environmental, etc.) and social (historical, cultural, social, economic, technical, political, institutional, etc.) specific context (Fig. 1). In doing so, we do not attribute aims nor objectives to the activity system or to the social entity *a priori*. These may be determined by the observer who interprets the decisions and practices according to the issues and a theoretical and disciplinary repository (emerging objectives) or made explicit by the social entity (expressed objectives). To apply the concept of activity system to a peculiar reality and to specific issues, we must define the content of its components: the considered social entity and its activity/ies, the categories of motivations for action and decision-making, the kind of representation studied, the resources taken into account, and the prioritized environmental components. These elements must be defined according to the research question (which specifies the issues, the disciplinary and theoretical frameworks) and to the agro-ecological and social context. This scoping exercise of the observation field is a condition of use of the concept and contributes to the analysis. What is the relevant social entity? What are the activity/ies we are talking about? How can we identify and take into account the various motivations (term explained in paragraph 3.2) of individuals within the social entity? Which representations must be taken into account? What resources should be considered? How to define the environment in question? The "outputs" of the activity system from the standpoint of the social entity are intrinsically linked to motivations, representations and types of activities considered. The "outputs" of the activity system expected by the community (nation, local governments, producers' organizations, etc.) are often not the same (Terrier et al., 2010). Therefore, which "outputs" of the activity system must be studied (income, quality of life, commodity production, non-market production, sense, adaptability, vulnerability, viability, environmental and social externalities, etc.)? Below, we will expose the issues and arguments for the choice of these observation units.

3.2. The contextualized scope of the activity system

The environment interacting with the activity system is both a context that defines the opportunities, strengths, threats and constraints, and a coproduct of the social entity considered and its activities. We recognize in particular the regulatory dimensions, the sectorial dimensions and the territorial dimensions at different levels of organization, space and time (Fig. 1). The irreducible incompleteness of the human thought forces to limit the elements of the environment to be considered. It would be unwise to specify in this short communication how to reason these choices. In contrast, we show below how to think the perimeter of the social entity, of the activity/ies, of the categories of motivations and the types of resources contemplated. This reasoning always depends on the question, context, knowledge available, and on disciplinary and theoretical choices. There is only one relevant activity system for a given context and a specific question (which leads us to choose the perimeter of the social entity, the activities, motivations and resources considered). Change the objective of the study and the question leads to change the perimeter of the activity system.



The concepts used in this figure are explained in the text: external resources, social entity, relationship to the body, etc.

Regulatory dimensions* : Policies, support devices, and systems of public and private standards (rules, institutions, tools, etc..), governance, relations of power, etc..

Sectorial dimensions** : Actors of the value chain and of professions; markets; price regulation; actors and rules of certification; etc..

Territorial dimensions*** : Identity (history, culture, heritage, boundaries, name, etc.); social and political organization (cooperatives, unions, local governments, etc.); physical dimensions (biophysical condition and planning); reticular organization (goods, persons, services, money, knowledge); any project of society in its space, etc..

Figure 1. The activity system

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Choosing the social entity

The activity system applies to an individual or a collective actor who initiates activities and contributes to implement them, who manages them, and gains an advantage of them. But it is also a theoretical prism through which the researcher attempts to capture a complex reality and answer questions. The actor of the combination of activities can be an individual, a couple, a household, a family, a small group, a firm or a small group of individuals. The choice of the social entity considered must allow to analyze the relationships established within the social entity (in the case of a collective actor), but also to examine the relationship of the social entity with its resources, activities, practices and environment. One way to reason this choice is to identify in the context studied what are the units of work, decision-making, management, residence, production, accumulation, savings, consumption and risk taking (Gastellu, 1980). These units do not always overlap and are not necessarily the same for all activities. Sometimes they may change quickly in time and space.

Who does what? Who decides what? And how individuals constituting the social entity define their place and their contributions to the activities, decisions and practices? How do they consider their relationship to resources and the socio-ecological environment contemplated? A research work on the structural transformations of the relationship to work of French livestock farmers (Tab. 1) has for example led to study the activity system of the individual, but also of the household (Fiorelli, 2010). Note that the choice of a collective actor as social entity (household, family, etc.) induces methodological constraints of conducting investigations to be thought carefully (who to conduct the interviews with? how?).

Delimitating the activities

Defining the meaning given to the activity leads to formulating *a priori* what we will observe but also sometimes the aim of the activity. As examples, the activity can be considered as an organized set of tasks within a process (ergonomics, agronomy and other technical sciences), a process that contributes to the production or the transformation of a product or service (sociology, economics), an identity, socialization, cognitive, learning or training process (sociology, anthropology, education sciences). The activity is a process that constitutes a whole that can be isolated from other processes. It may always be achieved in various ways (which refers to the concepts of technique and practice) and implies a decision (the choice of activity but also practices) and regulations (social, normative, etc.). The activity expresses a form of regularity (operational, social, temporal, spatial, cognitive, etc.) which is not incompatible with its highly dynamic features. This refers to the notions of transformation, creativity, innovation and adaptation. Describing a human activity necessitates defining what its perimeter is based on: work, income, production, value creation, the meaning, competence, space, period, qualification, responsibility, membership to a corporation, socialization, etc. These categories qualifying activity does not always overlap and may change over time. In many contexts, these activities are also very dependent on status (social, legal, tax) that should be identified.

For example (Tab. 1), research works conducted in Guatemala on technical practices in the coffee farming plantations lead to analyze in a privileged way the activities of creating goods and services which may be exchanged (on a market or not), as well as the studies and the main festivities. Indeed, three annual festive events punctuate the social, technical and commercial life of the producers. Depending on the issues and contexts, it may also be wise not to use qualifiers of activity that define corporatist positions defending the advantages of some sectors of the economy. In France, "agricultural" activity includes activities of production, transformation, marketing, tourism and service without falling in the status of pluriactivity.

Categorizing the motivations

The implementation of a combination of activities by a social entity implies a balance or a tension between several motivations, also called "subjective rationalities" by some psychosociologists (Dejours, 1998). Fiorelli *et al.* (2010) confirm that "work is not just about producing and making money, it makes you feel alive, and it leads to build oneself as a man". These motivations govern the choice of activities, practices and the meaning that gives them the social entity. We consider that the actor takes decisions based on his sole representations and not according to "pure and objective" information. His representations apply at all levels: on himself, his resources, his activities, his environment, how he considers the properties of his system (robustness, vulnerability), etc. The couple motivations / representations is at the heart of the decision making process which is rarely instantaneous when considering the activities and practices. We recognize the following 7 categories of motivations (Fig. 1):

- "Economic" motivations refer to the intention of optimizing the use of limited resources, to the project to create and exchange value in the form of goods and services (in a market or not), to production, distribution, consumption and accumulation logics.
- "Axiological" motivations refer to ideological and moral values of the social entity, its worldview, its conception of good and evil, ethics and/or search for a common good that can legitimize, justify or explain an activity, a practice or a decision (Macombe, 2005).
- "Relational" motivations refer to the intentions of interactions with other men and with animals, to forms of emotional investment, to the purpose to produce oneself, to live and work together (Fiorelli, 2010).
- "Identity" motivations refer to a type of choices and legitimations of the activity and practices such as "To be or not to be" by which social entity recognizes oneself or not. These motivations may be expressed in all fields of identity (professional, territorial, ethnic, religious, etc.). For example, in his relationships to the territory, the actor expresses (or not) an "I'm from here" (Senc  b  , 2004). The real and imagined characteristics of territories play an important role in the implementation or transformation of an activity.
- The motivations of the "body-at-work" (Dejours, 1998) refer to the physical and sensitive relation to activity, practice or work. It especially reveals expressions of painfulness, stress or, on the contrary, well-being, physical and psychic satisfaction in working.
- "Technical" motivations refer to the pleasure, or the displeasure, an individual gets while making a gesture and/or a technical performance.
- "Aesthetic" motivations refer to the feeling of beauty (landscape, gesture, product, etc.). It is also a way to select and justify the decisions made regarding activities and practices.

It is well understood that an individual never manifests its motivations according to the artificial decomposition nor does he refer to all types of motivations. The present list is probably incomplete. In any case, it invites us to pay attention to the complexity of the logics of action and the justifications given by an actor, in order to understand its decisions and practices. It also requires getting methodologies to identify them. Synergies and tensions between motivations allow us to understand decisions, arbitrations and arrangements, the choice and the dimensioning of activities, the technical and organizational practices.

Some motivations are more important than others, depending on the issues, cultural and socio-economic contexts as well as leeway available for the actor. To accurately delimit the perimeter of the activity system, the motivations that the researcher will examine or disregard, must previously be characterized and justified. Too often the choices are unquestioningly taken and limited to the "economic" motivation (*Homo   conomicus* pattern). Yet they are essential for ensuring the rigor of scientific reasoning and for avoiding the ideology trap. Choosing the motivations to be

considered in a study generally depends on time, social and spatial analysis scales. Characterizing a territorial dynamics and the diversity of activity systems at a small region level, where the weight of the socio-cultural and political heritages is decisive, does not call for a large range of motivations (Tab. 1: case studies from Ecuador and Bolivia). However, analyzing intentions and practices at a project level (expressed by an individual) requires taking into consideration a wide variety of motivations (Tab. 1: case studies from France, Argentina, and Guatemala).

Available resources to be considered

We consider different types of available resources, focusing as much on the questions of property as on the questions of access (Fig. 1) :

- "Human" resources: qualitative and quantitative dimensions of work, health, age, gender, knowledge and know-how, and others;
- "Natural" resources: land, water, fertility, genetic resources, and others;
- Material resources: equipment, buildings, tools, and others;
- Financial resources : cash reserves easily accessible;
- "Informational" resources: means to get information, technical and economic information, but also knowledge of coordination forms such as conventions, norms and rules;
- Identity resources: ethnicity, cultural and professional heritages, and others;
- Social resources: including authority (charismatic, legal, traditional), insertion into networks and social organizations (technical, commercial or otherwise), forms of solidarity which the actor can claim, and others.

Issues may call for other pertinent types of resources, such as territorial resources (Gumuchian & Pecqueur, 2007) or patrimonial resources (Pecqueur, 2003) among others. These resources are in interaction and vary in time. They are rarely substitutable and often unevenly mobilized depending on the considered activity. They depend mainly on the social entity (internal resources) or form the conditions by which the activities are carried out (external resources). We consider that resources cannot be always regarded as capitals. For instance, an inherited ethnic identity is not subjected to exchange and accumulation. This is why we decide to not use the term "capitals".

Of course, resources are not all of same importance in decision making, action, and creation of value and meaning. The strategic resources change with societies, historic periods, moments of one's lifetime, activities, so on. They mainly depend on historical construction of social relationships and modes of resources control. Apprehending the practices of the actor as well as his decisions requires to identify what the actor recognizes as values produced by the activity, and therefore what is or is not a resource for him.

3.3. Functioning and dynamics of the activity system

In essence, the activity system requires us to pay specific attention to interactions (Fig. 1): interactions between activities (product, time, space, income, risk, meaning, etc.); interactions between resources (competition, complementarity, synergy, etc.); interactions between the different elements of decision (motivations, representations, strategies, etc.); as well as interactions between (i) the members of the social entity (if various), and (ii) the social entity and its political, normative, territorial and sectorial environment. We consider that the activity system is in a permanent dynamic which implies to study carefully the co-evolution of the system with its environment. It is not only the history's social entity and its activities but also the history of its environment in its political, socio-economic, technical and ecological dimensions. That implies to analyze the different time scales of action and decision making. To think out the dynamics of

the activity system lead us to appreciate other dimensions of it: vulnerability, flexibility (Gasselin, 2009 ; Bathfield et al., 2010), resilience and sustainability (Terrier et al., 2010).

4. Discussion and conclusions

In spite of sharing similar research subjects, the Activity System approach differs from the Sustainable Rural Livelihoods (SRL) framework in many aspects. The SRL approach was stabilized in 1991 by the reference paper of Chambers and Conway (Chambers & Conway, 1991) from the Institute of Development Studies (IDS). A SRL is defined as “*the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base*” (Scoones, 1998). The goal was to develop a multidisciplinary people-centred perspective on development for policy and practice. Built in parallel with a political reflection on the notion of sustainability, the concept of SRL was rapidly taken over by many international political institutions leading to an explosion of research papers on SRL till mid-2000s.

The resulting plethoric amount of studies often led to an oversimplification of the SRL framework and highlighted its practical limitations (Scoones, 2009). Indeed some authors pointed out the difficulty for researchers to apply this framework and some weaknesses such as (i) the consideration of substitutability of the different capitals (physical, financial, human, social and natural), (ii) the lack of local historic embedment, (iii) the lack of systemic perspective, (iv) the current debates around the notion of sustainability and (v) the difficulty to take into account “hidden resources” such as cultural ones (O’Laughlin, 2004 ; Gaillard & Sourisseau, 2009 ; Scoones, 2009).

The Activity Systems approach provides a new perspective that avoids these pitfalls by focusing on the activity rather than the capitals (i.e. the combination of activities makes the system and defines its consistency). Moreover, the Activity System approach is not only applied to poor people as commonly done in the SRL. In the Activity Systems approach the importance is given to the analysis of decision-making and practices, while considering the poly-rationality of the actor in a systemic perspective. This approach also stands up because of (i) the imperative contextualizing of the system and its environment, (ii) the consideration of resources and not capitals, (iii) the examination of the historicity and (iv) the relationships to the environment (both a context and a product of the activity). Finally, the Activity System framework aims at facilitating the task of the researcher in situations difficult to read with usual concepts.

As defined, the concept of activity system allows works of categorization of social and technical forms observed in the diverse “rurality” expressions, and not only in the agricultural ones. It leads to analyze, from a systemic perspective, activity, practices and decisions, as well as interactions between activities, resources for action and decision, as well as actor’s representations and motivations. We are invited to compare the processes of small-scale agriculture transformations and to interpret the forms of articulation a social entity keeps with any organization upper levels (markets, territories, public policies, norms). The historicity of the activity system needs to be studied, considering that the social entity is at once (i) the product of a micro-history and a societal history, (ii) an entity which adapts itself (or not) to action regimes, perturbation and uncertainty patterns, but also (iii) an actor of socio-economic, political and ecological processes, while contributing to the technical and social facts in territories, organizations and networks.

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