# Considering the Diverse Views of Ecologisation in the Agrifood Transition: An Analysis Based on Human Relationships with Nature

Danièle Magda, Claire Lamine, Jean-Paul Billaud

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## DANIÈLE MAGDA

*INRAE-UMR AGIR*
*Castanet-Tolosan, France*
*Email:daniele.magda@inrae.fr*
*https://orcid.org/0000-0002-6581-7447*

## CLAIRE LAMINE

*INRAE-Unité Ecodéveloppement*
*Avignon, France*
*Email: claire.lamine@inrae.fr*

## JEAN-PAUL BILLAUD

*CNRS-UMR Ladyss*
*Université Paris Nanterre, France*
*Email: billaud@parisnanterre.fr*



## ABSTRACT

This article aims to characterise the visions of ecologisation found within scientific approaches embraced by different epistemic communities, and which have inspired empirical work and public action on agrifood system transitions. Based on comparative readings of works anchored in our two disciplinary fields (ecology and sociology), we identified six large ensembles of epistemic communities as well as their points of convergence and divergence. We identify six ideotypical visions of ecologisation based on the types of 'relationships to nature' embedded in these large sets of epistemic communities: protectionism, functionalism, structuralism, post-structuralism, relational and pragmatist-experience-based. We suggest that pragmatist-experience-based approaches allow us to transcend two classical oppositions: between realism and constructivism, and between a conception of nature as passive and external as opposed to active and relational. Without claiming to offer a detailed analysis of these approaches, we hope that our work can be used as a tool to support reflection among scientists and other actors involved in agrifood system transitions.



*Environmental Values*
Submitted 11 May 2021; accepted 5 August 2021; fast track 6 December 2021
doi: 10.3197/096327121X16387842836940

## KEYWORDS

Ecologisation, agriculture, epistemic communities, human–nature relationships

## INTRODUCTION

The concept of ecologisation emerged in French-language research of the early 1990s to describe the inclusion of environmental issues in public agricultural policies (Berlan Darqué and Kalora 1992). Mormont later redefined it to indicate 'the processes by which the environment is taken into account in public policies, in organizations, even in professional practices, etc.' (Mormont 2013: 159). The term ecologisation, which is mainly used in the scientific literature, is much less institutionalised than 'sustainable development' or the 'ecological transition', which are well established in environmental policies.

Many existing scientific approaches in a variety of disciplines are sometimes debated as representing different a priori *views of ecologisation*. By 'view' we mean not only interpretations of phenomena and mechanisms – which may either support or hinder ecologisation – but also visions of a desirable future. However, such views are not always entirely explicit, although these approaches strongly influence the actors involved, whether through public policies, education or the media. Clarifying these multiple views is therefore essential in analysing or supporting ecologisation to gain an understanding of actors' different stances.

Analysis of the various views of ecologisation in agriculture and agrifood systems has been significantly shaped by controversies on what 'good' or 'real' ecologisation represents (often without the term itself actually being used). This has resulted in dichotomies (strong v. weak, disruptive v. progressive, holistic v. reductive, etc.) that abound on topics such as agroecology (Dalgaard, Hutchings and Porter 2003; González de Molina 2013; Duru, Therond and Fares 2015; Rivera-Ferre 2018; González de Molina and Lopez-Garcia 2021), or in proposals to define the degrees of ecologisation objectively, especially in the agricultural sciences (Hill and MacRae 1996). While some social science research has explored the many narratives around ecologised agriculture and agroecology, it mainly focuses on the legitimisation strategies being used (Levidow 2015; Montenegro de Wit and Iles 2016). However all these views never home in on the *relationships to nature* at play.

When the subject of ecologisation arises, nature is very often mentioned as the entity with which humans must rethink their relationship. But the ways in which our ties and our conceptions of nature must be transformed are seldom explicitly articulated beyond general references to impact reduction, biodiversity conservation or sustainable use of natural resources. And yet, such conceptions are integral to any view of ecologisation (Magda, Doussan and

Vanuxem 2020). Although human–nature relationships have been the subject of substantial debate and research since the environmental crisis emerged in the 1970s, it is mainly environmental psychologists, anthropologists and philosophers who have identified new challenges. In relation to psychological approaches for example, focus is put on how we must rethink our relationship with nature at the individual level, as well as the links to our environmental behaviours (van den Born 2008; Braito et al. 2017). Today, anthropologists and philosophers such as T. Ingold, P. Descola and many others are inspiring various empirical approaches and political discourses on our relationship with nature, within what we will call 'relational approaches' in this paper. However, scientists working on ecologisation processes in various disciplines from the biological, natural and social sciences do not generally specify the relationship with nature embedded in their conception of ecologisation.

Our goal here is to show why it is important to explicitly state and characterise the scientific views of ecologisation by their relationships to nature. We are not attempting to produce an exhaustive, detailed analysis of the history and trajectory of scientific approaches, nor meticulously characterise each approach, but rather to identify broad types of views of ecologisation for pedagogical purposes, putting forward a tool to support reflection among scientists and other actors involved in the agrifood system transition.

Our methodology is based on a comparative reading of scientific literature and working sessions during which we progressively refined both the characterisation of ideotypical views of ecologisation and the grouping of scientific approaches according to their points of divergence or convergence. We identify six main ideotypical views of ecologisation embraced by six large groups of epistemic[1] communities: protectionism, functionalism, Marxist- and structuralist-inspired approaches, post-structuralism, relational approaches and pragmatist-experience-based approaches.

Articles to be read were selected in several phases, with a first set identified based on our knowledge of scientific approaches in our respective disciplines (ecology and sociology, mainly from the French-speaking world) and other fields (philosophy, anthropology). We then added other articles cited or suggested by authors involved in the identified epistemic communities. The comparative reading process was structured using an analytical grid highlighting how the authors deal with ecologisation (issue, object, objectives), their theoretical and epistemic references, and their relationship to nature (whether implicit or explicit).

Working together as an ecologist and two sociologists, our joint perspective enables us to tackle a wide range of approaches. Our analysis covers a period from the 1970s – marked by the early rise in awareness of 'environmental issues' at the international level (Aspe and Jacqué 2012) – to the present

1. We use the term of epistemic community in a broad sense here, in order to describe a large ensemble of scientists who mobilise common concepts and theories.

day (2020), when the ecological transition is front and centre in national and international policies with simultaneous alarm calls of urgency from specialists in biodiversity and climate sciences.

## PROTECTIONISM

These approaches are part of a long history of nature protection movements that emerged in the late nineteenth century in France and the United States, mainly in response to initial observations of the negative impact humans were having on nature. Two historical preservationist currents – one inspired by the American wilderness (Thoreau [1854] 2016; Muir 1912) and one influenced by resource conservation – each embodied, respectively, either an aesthetic and idealised approach that views nature as something to protect above all for its own sake, or a pragmatic approach that sees nature as something that provides resources (Bergandi and Blandin 2012). These two currents laid the groundwork for the scientific and political debates that contributed to the creation of the first international nature conservation initiatives (International Union for Conservation of Nature in 1948, United Nations Environment Programme in 1972).

The resource conservationist approach, which is a more anthropocentric version of protection, has expanded considerably with the development of the ecological sciences. Conservationist approaches gradually shifted away from early ecological theories – especially those of Eugene Odum, which supported the existence of a natural equilibrium – and embraced the idea that a more rationalised use of natural resources is the most effective way to ensure human well-being while protecting nature. However, these conservationist approaches are subject to criticism on two fronts: first, that they take a utilitarian, short-sighted and hierarchical view of nature, and second, that they are ineffective in terms of nature protection. These approaches have dominated nature protection approaches since their inception and underpin various concepts such as sustainable development that have been widely adopted by institutions.

Other protectionist approaches with a more ecocentric view have also developed, but with different ideas about which aspects of nature should be preserved and the role of interventionism. Some of these approaches have established their scientific and technical foundations by drawing from the sciences that focus on describing and classifying living things. Some fields, such as phytosociology, support the idea of nature as an organised entity resulting from a long evolutionary history. They sometimes adhere to certain aspects of early ecological equilibrium theories. These approaches consistently attach a fixist perspective to the idea of protection. They are still very common in environmental action, whether at the public policy level or in the underlying

technical background of environmental management agencies, especially in parks and reserves.

Other approaches have sought to provide a more dynamic and evolutionary perspective to the idea of protection. Conservation biology emerged in the 1980s as a crisis discipline to address biodiversity losses (Soulé 1985). It takes a holistic approach to protect the evolutionary processes that govern both biodiversity as a whole and natural ecosystems (Meffe and Carroll 1997). It carries on from Aldo Leopold's *evolutionary-ecological land ethics*, which developed an ecosystemic perspective very early on, even though it is still associated with the idea of equilibrium (Leopold 1972). Conservation sciences promote a multidisciplinary approach to conservation, namely by combining technical and social sciences such as conservation anthropology.

For its part, the historic wilderness movement gained a new lease of life in the last 20 years with the rise of rewilding. This approach, which was founded at the crossroads of radical ecology and conservation biology (Barraud et al. 2019), aims to allow natural areas to regain their wild character and freely evolve in the absence of human activity and control. Rewilding can be passive (e.g. abandoned agricultural land) or active, where species are reintroduced for their own sake or their role in the food web (network ecology, systems theory) (Scheffer et al. 2012). This trend is highly controversial, even within the field of environmental protection itself, but it resonates among philosophers and environmental activists who advocate for an ethical and moral discourse to defend the intrinsic value of nature (Maris 2018).

These different environmental and nature protection approaches are constantly being redefined following tensions that have arisen between more ecocentric positions and more utilitarian stances represented by conservationist approaches. But they all hold a similar view of nature as an entity apart from us, governed by natural laws. In this case, our relationship with nature is first and foremost described in terms of negative impacts, because our actions challenge the natural order that results from a long evolutionary history. Ecologisation involves maintaining or restoring this natural state.

## FUNCTIONALISM

Functionalist approaches go further than the idea of protecting nature from our impacts. They seek to rationalise our actions differently by looking at them based on an objective understanding of the *functions* of ecological or biophysical processes.

They represent a broad and fairly disparate set of approaches that differ in the choice of processes studied (according to disciplines) as well as in the way they view the link between knowledge of natural mechanisms and human action. They draw heavily from the ecological sciences, and especially from their

understanding of the processes involved in the dynamics of biological diversity. These approaches have inspired new arguments for environmental action based on the functions and services that nature provides for humans, and have established new reference points for environmental policies. One of the key concepts resulting from these approaches is that of ecosystem services, which are widely reflected in environmental policies as 'environmental services'.

This functionalist approach is deeply embedded in the ecologisation of agriculture, whether through agri-environmental policies or through the development of new types of ecologised agriculture. Most of these new types of agriculture, such as agroecology, are based on principles and narratives linking ecological functioning with that of production systems. The widespread use of biodiversity as a concept that represents the functions and services it can provide (flexible operations, economic diversification, agricultural system resilience, disease resistance, etc.) is a particularly enlightening example of the integration of this functionalist approach in agriculture.

Socio-ecological approaches have set themselves apart by acknowledging the co-evolution already at work between humans and nature. More specifically, they aim to maintain the functions of the *socio-ecological system* that are virtuous for both interacting components, i.e. humans on one side and nature on the other. Holling (1973) developed one of the first and most successful functionalist approaches to the socio-ecological system with the theory of adaptive cycles with the concept of resilience. It has been applied to agriculture mainly with regard to the problem of adapting agricultural systems to different climatic, economic or market constraints. Today, a wide variety of approaches claim to be more or less explicitly socio-ecological (Binder et al. 2013; Ollivier et al. 2018). They represent either variants of a given theory such as resilience (e.g. Ostrom's framework) or a new concept with a redefinition of what makes a system (the nature of its economic and social components and how they are connected), informed by different theories, disciplines and issues.

Metabolic approaches are described as a specific type of socio-ecological approach. The aim here is to re-attach our activities to material components in response to what Marx called the *metabolic rift*. In metabolic approaches, nature is seen primarily in terms of physical and chemical materials and flow balance, rather than through its processes as they relate to living beings (Fischer-Kowalski et al. 2011; Haberl et al. 2011). However, some socio-metabolic approaches do draw from ecosystems and their functions, such as the work of Sundkvist, Milestad and Jansson (2005) with the concept of *ecological feedback* or Tello and González de Molina (2017) with the concept of *ecological fund*. Different theoretical fields, such as the circular economy or territorial ecology, have developed the idea of metabolism on a territorial scale with spatio-temporal modelling of human activities through the material flows that they can organise and regulate, and sometimes immaterial ones with the

recent development of territorial ecology (Buclet and Cerceau 2019). From this perspective, agriculture – with its capacity to export biomass as well as living material – is viewed as a major component of territorial metabolism. Long-term scenarios for agriculture on a territorial scale are developed based on how they complement each other in terms of waste recycling (Billen et al. 2019).

In these approaches, ecologisation is driven by the idea that a better understanding of how nature works will allow us to use its resources without compromising it. Nature is above all a resource to be exploited, namely by managing the various functions/services it can provide. It tends to be disembodied from the life forms it supports with a focus on modelling its mechanisms and processes. Although these functionalist approaches seek to functionally connect humans and nature, the two remain separate entities.

## MARXIST AND STRUCTURALIST APPROACHES

In the social sciences, Marxist-inspired approaches mainly developed in the political economy and environmental sociology fields from the 1970s onwards. They have recently received renewed attention under the influence of new readings of Marx's work. Rather than dealing with ecologisation directly, they explore the phenomena of intensification and industrialisation; in other words, the 'de-ecologisation' of agriculture and food systems.

From the mid-1970s (following the oil crisis), intellectuals such as André Gorz showed that the ecological crisis stemmed from maximising flows as dictated by a profit-driven logic. This echoed Marx's analyses of the effects of 'large-scale mechanised agriculture' which spoils the natural force of the land, just as large-scale industry ruins labour power (Foster 1999). At the food system scale, the theory of *food regimes*, put forward in the 1980s, analyses the way they have changed throughout the history of the world capitalist economy in relation to the processes of capital accumulation. It shows how 'ecological' conditions have driven the specialisation of large regions in a wider context of reconfigured geopolitical power relations and production-consumption relations, with 'ecological effects' that are as disastrous for the planet as the social effects are for small farmers and rural communities in the Global North and South (Friedman and McMichael 1989). Environmental history studies on the agrifood industry that analyse how links between cities and areas of agricultural production are redefined (Cronon 1991 on Chicago) or the fragmentation and recombination of agricultural raw materials (such as wheat or maize) into agro-industrial products lead to the same conclusions, as does the work of the French regulation school (Allaire and Wolf 2004). Similarly, research in American environmental sociology highlights the way in which the capitalist system has built its own sustainability (as in enduring over time) to

the detriment of environmental sustainability (Buttel 2006). In the 1970s and 80s, the Marxist-inspired French rural sociology, within the 'Rural Sociology Group' as it was known at the time, tried to document the changes among rural peasants within the industrialised capitalist world and their integration into the 'encompassing society' (Jollivet 2009).

From the 1990s onwards, the increasing mainstreaming of environmental issues has generated a new body of critical work. Authors working in food regime theory have shown how, over time, the influence of 'alternative systems' and 'environmental pressures' leads to the emergence of a *corporate environmental food regime* (embodied, for example, by private certification systems). Rather than favouring the ecologisation of agriculture, this tends to create new processes of exclusion (Campbell 2009) and a 'post-neoliberal' food regime (Tilzey 2019). Meanwhile, analysis of the growing environmental activism movement has identified key processes of social differentiation such as the tendency of environmental movements to project the values of dominant social groups by excluding marginalised actors (Forsyth 2007) as well as the 'depoliticization' of ecological issues (Fabiani 2017) via the technical, administrative and expert management of environmental issues (Aspe and Jacqué 2012).

Other critical perspectives are developing in political ecology, where some authors claim a Marxist filiation, particularly among geographers (as in the case of R.L. Bryant), even if this filiation forms a composite whole in disciplinary and theoretical terms. New readings of Marx's work, such as Foster's take on metabolic rift, also take a new look at the treatment of environmental issues by bringing the natural limits of capitalist expansion to the fore (Lamy 2016). Other authors extend critiques of environmental justice to the scale of food systems (Gottlieb 2009; Agyeman and McEntee 2014) or show, through the idea of 'environmentalism of the poor', the processes of resistance by the poor to the environmental damage imposed by the rich (Martinez-Alier 2014). Authors at the intersection of political ecology and science studies adopt a Foucauldian reading, aiming to recognise the political and constructed character of concepts such as degradation and risk (Forsyth 2003), from a perspective centred on the co-construction of knowledge and social order (Jasanoff 2004).

In these Marxist and/or structuralist currents, which are rooted in a critique of 'capitalist' modernisation, nature remains in the background and is seen above all as a stock of resources (exploited by some; fragmented and recomposed for the needs of the agrifood industry, for example; and, of course, degraded, which echoes the conservationist approaches presented above). The term 'environment' dominates these currents, which is a way of distancing humans from nature. Above all, the focus is on de-ecologisation, with parallels drawn between the social and ecological impacts.

## POST-STRUCTURALISM

Various approaches claim a more process-oriented perspective. They are encompassed by 'comprehensive' rural sociology, pragmatic sociology, actor–network theory and anthropology of nature, and developed in response to the principles of homogeneity and internal coherence of social structures that characterised the previous approaches.

Long before the rise of environmental issues and the argument of the limits to growth (1960s–70s), a rural sociology emerged in the post-war period, particularly in the United States and France, that some describe as the 'supportive' sociology of agricultural modernisation (Laferté 2014). This applied research, in direct contact with the real world, adopted comprehensive perspectives to understand the meaning that the actors themselves assigned to the changes the agricultural and rural world was undergoing and the ways of adapting to them, in contrast with the previous structuralist perspectives. This 'comprehensive' orientation persisted within the context of the 'environmental crisis', and with the emergence of agri-environmental policies. Sometimes criticised as being subservient to governmental interests and/or other disciplines (agricultural sciences and ecology), this research has not only bolstered recognition of actors' ability to define their own paths and produce their own knowledge, but it has also highlighted collective dynamics and their effects on the ecologisation of agricultural practices (Darré 1996; Lémery 2003; Compagnone, Lamine and Dupré 2018). This recognition of individuals' and collectives' ability to take action is part of a broader renewal of sociological theories that are expressed, for example, in Anthony Giddens' take on reflexive modernisation (Giddens 1990). This has led some authors to label the emergence of an 'integrated' rural development paradigm in the agrifood sector as the successor to the productivist paradigm, with a more optimistic perspective than that held, for instance, by food regime theorists (van der Ploeg et al. 2000; Marsden 2004).

In France, this epistemological renewal was reflected in the 1990s by the development of the 'new sociologies' (Corcuff 2000), which were resolutely constructivist. Pragmatic sociology, which rejects the 'critical', so-called 'unveiling' perspectives – e.g., Marxist or Bourdieusian – calls itself a 'sociology of criticism' (Boltanski and Thévenot, 1999). Here, the views and stances of the actors, and the compromises or controversies between these views, are the main object of analysis, whether with regard to the environment (Lafaye and Thévenot 1993) or other subjects. Actor–network theory (ANT) proposes taking an interest in the role of non-human beings in 'socio-technical' systems, in order to overcome the modernist ontological rupture between nature and society (Latour 2012). In this respect, it echoes attempts to move past sociocentrism, which began with debate on the new ecological paradigm by Dunlap and Catton (1994) and was based on the idea of human activities being dependent on natural resources and habitats, even though these authors are

rarely if ever cited by Latour. Latour does, however, acknowledge the fundamental contribution of Cronon in recognising the role of non-human beings and hybrid objects embodied in *Nature's Metropolis*. ANT inspired a range of research from the 2000s onwards, and especially work focusing on the analysis of controversies (stemming from environmental impact projects, pesticides, etc.) and technical democracy (Callon, Lascoumes and Barthe 2001).

From the 1990s onwards, some anthropologists have also sought to move beyond the dualism between humans and nature. Philippe Descola set out to show the diversity of human–nature relationships by describing, beyond our Western societies, his four main 'composite worlds' (animism, naturalism, totemism, analogism). Tim Ingold radically broke away from this duality by developing a new ontology, an 'ontology of dwelling', based on his work on Arctic societies and their ties to the environment they inhabit as organisms (Ingold 2015). This stance in anthropology of nature is echoed in recent analyses of the shifts in living organisms' relationships with agriculture, where animals, plants and the soil are recognised as active entities in a holistic view of agricultural activity (Foyer 2018).

In these very diverse 'post-structuralist' currents, nature and ecologisation are placed front and centre, starting with what actors say and do (symbols, representations, world views, framing, practices, etc.) within many different and 'competing' conceptual frameworks, which resist any exhaustive description, but account for the various conceptions of nature as well as ecologisation pathways. This leads to a view of nature and its objects as passive, except in certain currents that consider nature and its objects as acting entities.

## RELATIONAL APPROACHES

Given the urgent environmental situation today with alarming reports (such as those as from the Intergovernmental Panel on Climate Change and the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services, development of collapse theories, etc.), calls have been made for radical changes in our ontological relationship with nature. These propose establishing a *link* with nature, as a way of going beyond the debate on dualism and thinking differently about our relationships with nature. Instead of adopting either a biocentric or anthropocentric mindset, the aim is to (re)build a relationship with nature and its entities (Larrère 2010).

Research in environmental and conservation psychology has examined the role of the psychological dimension in the connectedness between humans and nature (Clayton 2012). Many concepts have been developed to describe the degree of emotional attachment and connection of individuals to nature (Kals, Schumacher and Montada 1999), connectivity to nature (Mayer and Frantz 2004) or on a more cognitive level, the inclusion of nature in the self (Schultz

2002). Today, it is also mainly philosophers (environmental, ethical, moral) and anthropologists of nature who study these relational approaches to nature, often based on reinterpretations of older philosophical works (for example Deleuze, Canguilhem and others). These discourses find a strong echo in the political sphere, among activists and most remarkably among the general public, so much so that books such as *Manières d'être vivant* (Ways to be alive) by philosopher Baptiste Morizot (2020) have practically become bestsellers in France. We will mention three main approaches to provide reference points in this emerging field, which offers a great many theories.

One approach is defended by those who seek to change nature's status in law with alliances between lawyers involved in environmental law and animal law, scientists working on animal sensitivity and consciousness, and animal rights activists. The aim is to personify nature or its entities by giving them the status of subjects instead of objects in law (Hermitte 2011). This approach has been put at the forefront in denouncing conditions on livestock farms and in slaughterhouses, and even livestock farming itself (Regan 2006). Some countries have already granted legal rights to nature by personifying it (for example, the Whanganui River in New Zealand and the Atrato River and Amazon rainforest in Colombia), but generally countries have refused to change their founding principles of law.

The *care or ethics of care* approach stems from moral philosophy and feminist theory (Gilligan et al. 2017). It aims to refocus moral thinking on the relationships between human entities and through concrete practices (Tronto 1993) by emphasising the concepts of vulnerability (Laugier 2012), interdependence and care (Wood 1994). Tronto and Fisher (1990) extended the concept of care to the relationships between humans, animals, plants and the environment with whom we share vulnerability. Recent studies have explored care in different agricultural contexts, in particular livestock farming (Donati 2019), as well as in specific types of agriculture such as urban agriculture (Pitt 2018), or permaculture (Centemeri 2019).

Other approaches take up the argument of our common biological origin and *filial* relationship with nature, and therefore our belonging to a same biotic community sharing a common fate. However, authors develop different views about this community and the nature of our relationship with non-humans. For example, Morizot (2017) posits that we form a diplomatic cohabitation with entities of nature whose alterity is irreducible. The relationship is *political* since it is about creating vital alliances with the entities of nature that *enter into the relationship* as interests and singular powers. Ingold (2011), with his concept of dwelling, puts forward a theory of perception that consists in perceiving the environment not to discern the things we might find in it but to join them in the material flows and movements that contribute to their and our formation.

Considering ecologisation as a process for taking environmental issues into account in activities and practices no longer makes much sense in these relational approaches, since it is a way of being *with* nature, or even being *in* nature. Nature is represented by tangible, embodied entities with which the relationship can be forged (more individuals and organisms than ecosystems) or which disappear in favour of the relationship itself. Even if there are controversies between these diverse relational approaches, they all seem to converge towards the same goal: creating a link with nature. But a critical analysis of these approaches has not yet been carried out to analyse how they could be concretely transformative within an ecological transition process.

## EXPERIENCE-BASED APPROACHES INSPIRED BY PRAGMATISM

In different temporal and cultural contexts, ecologisation approaches rooted in lived experience have emerged, and to this end they adopt a more or less explicit pragmatist perspective. These diverse approaches share a few key elements: first, the idea that it is through the experience of nature, and/or for some the sensory-based link that unfolds in this experience, that a process of ecologisation of practices can occur (in this, they align with some of the above-mentioned relational approaches); second, the leveraging effect of collective dynamics to build situated knowledge; and third, support for interdisciplinarity that cuts across the social and biological sciences. This re-connects to the first wave of interdisciplinary work on environmental issues in the 1980s and 90s in France, which aimed to bring the social and bioecological aspects of the issues at hand together into a single analysis, in order to develop a 'multidimensional' understanding (Jollivet 1992, 2009), while also taking the objects of nature and non-human beings seriously.

The initiatives, networks and approaches that developed in Latin America from the 1970s onwards under the influence of Paulo Freire's pedagogy of liberation can also be considered to be part of these experience-based approaches. They have resulted in a multitude of grassroots initiatives on the ground, such as those dealing with alternative agriculture in resistance to modernisation, the 'green revolution' and military dictatorships (particularly in Brazil). These initiatives promote 'peasant knowledge' (Rosset et al. 2011) and group dynamics that build collective reflexivity from lived experiences. More recently, this experience-based perspective (without explicit reference to the term) can be found in the 'sentipensar' approaches developed by Arturo Escobar. These are based on a critique of development and the claim to 'pluriversalism', in the 'epistemologies of the South' that are a part of decolonial theory (Santos 2012; Escobar 2016) or in 'environmental rationality', defined as the confluence of cultural diversity and environmental complexity (Leff 1993).

In France, it was in the 2000s and 2010s that approaches promoting a pragmatist and experience-based perspective on ecologisation, according to Dewey's definition, began developing. These approaches borrowed the key principles of relying on collective experience/experimentation (and the expression in action of the visions and values that this allows), and of collective enquiry into the consequences of this experimentation. Some action research approaches to agroecological transition, which combine social and biological/agricultural sciences, today represent this perspective (Coolsaet 2016; Brédart and Stassart 2017; Mélard and Stassart 2018; Hazard et al. 2020). Many of these build on the work of philosophers who themselves have drawn on Dewey's theories (such as Zask 2020, on participation), but they are also marked by a much wider range of disciplinary and conceptual influences: that of Freire via popular education, of Sousa Santos on epistemic justice, phenomenology and the recognition of the 'senses' (Peroni and Roux 2006; Micoud 2007), and of French pragmatist sociology, with concern given to analysing the many views and values at stake, and the controversies and reconfigurations generated (Cefaï 1996; Chateauraynaud 2009).

In the English-language literature, there are many approaches described as 'experience-based' in the field of agriculture and food systems, which emphasise the knowledge of the actors, the notion of collective experience (Hassanein and Kloppenburg 2010; Lyon et al. 2010), and the capacity of marginalised groups to speak for themselves: the *liberation ecologies* (Peet and Watts 1996) that echo Latin American approaches to emancipation. However, authors claiming Deweyan inspiration are much rarer (Hassanein 2003; Hanagan 2015; Carolan 2016), although this is mentioned within various 'environmental pragmatism' approaches (Katz and Light 2013).

In these experience-based approaches, which claim to be neither fully constructivist nor realist/objectivist, ecologisation is seen as a process 'in the making' through the lived experience (individual or collective) of nature. Nature is revealed in the actors' perception and experience (in a more consequentialist or more sensory-based way) through investigation or collective experimentation.

## DISCUSSION

Our analysis has shown that the views of ecologisation represented by the different scientific approaches that we have grouped into six large sets of epistemic communities can be characterised based on their implicit or explicit relationship with nature (Figure 1). From a methodological point of view, our mapping confirms that consideration of large sets of epistemic communities (protectionism, functionalism, Marxist- and structuralist-inspired approaches, post-structuralism, relational approaches and experience-based approaches)

constitutes a relevant depth of focus for analysis to capture contrasting views of ecologisation. Nevertheless, some of these major groups can be quite heterogeneous (e.g. post-structuralist currents), but with some overlap due to historical connections between approaches or authors who may represent intersecting positions. For example, although André Gorz embodies a radically critical and Marxist political ecology, he suggests – under the influence of Maurice Merleau-Ponty's phenomenology and from a perspective that could be described as 'Marxist existentialist' (Gollain 2009, 2012) – avoiding the removal of human experience by focusing on perception and lived experience.

In a further step and in order to facilitate the appropriation of our 'mapping' and more largely the training around ecologisation visions for potential users, we identify three key traits discriminating visions that link or differentiate the six sets of communities. Three dividing lines show the two opposite modalities taken by each trait in the two areas in Figure 1.

A first dividing line allows us to differentiate communities with regard to their epistemological perspective – either realist or constructivist. These two perspectives immediately raise questions and impose choices about how to consider the materiality of the world around us (nature). Choosing one or the other results in a radically different way of addressing the complexity and uncertainty to which nature exposes us. It is interesting to note that this divide unites protectionist, functionalist approaches with Marxist approaches, but cuts through experienced-based approaches in their attempt to escape one or the other (experience, whether lived or perceived, does not fit into either of these two perspectives).

A second dividing line brings together the protectionist and Marxist-inspired approaches that consider relationships with nature according to the general idea that humans 'naturally' have a negative impact on nature, an idea inherited from the first observations of degradation of species and habitats. These approaches seek to reduce the impacts assessed from a quantitative or qualitative perspective, but do not question the predefinition of the relationship between humans and nature as based on impacts. In contrast, the other approaches postulate that these relationships are not predetermined but built from the processes at play. However, some approaches differentiate between ecological processes on the one hand and social processes on the other (functionalist approaches), while other approaches focus on the processes that link them (experienced-based and relational approaches).

The third dividing line accounts for two archetypal conceptions of nature with which we compose our views of ecologisation: nature as an entity external to our societies and passive with regard to our actions, or nature as an 'acting force' or an entity with which we are in contact. These conceptualisations of nature are not usually made explicit, because it is the value of nature (instrumental, market, intrinsic, etc.) that is most often highlighted. This dividing line thus shows that the idea of nature as an external and organised component

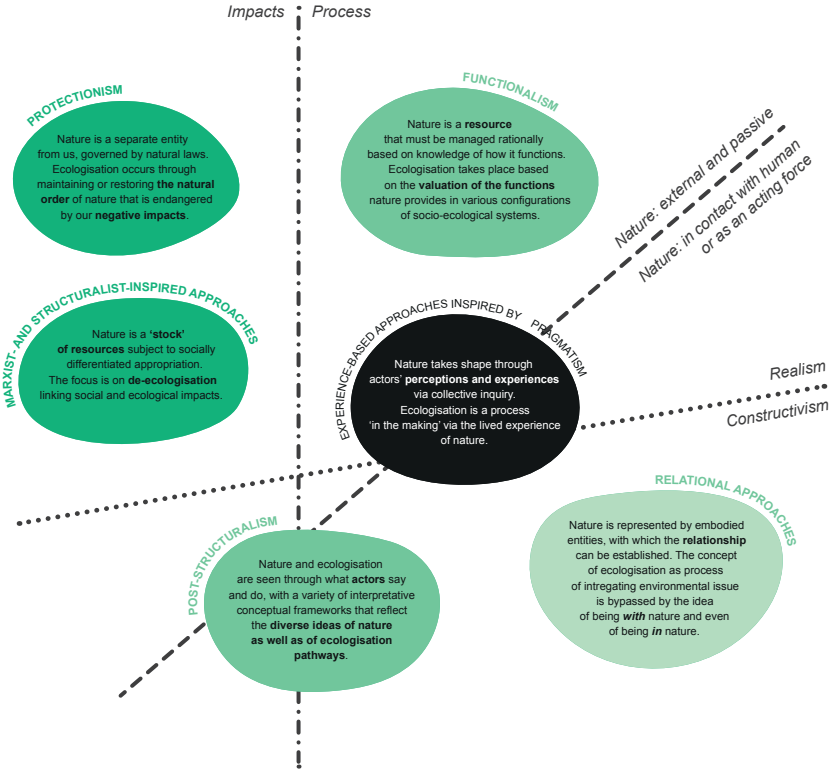


Figure 1. A representation of the diversity of scientific views on ecologisation in agriculture and agrifood systems, based on the identification of large epistemic communities in biological sciences and social sciences involved in this issue and the characterisation of their relationship to nature. Each of the six ellipses represents a distinct view of the conception of nature and the correlated approach to ecologisation (texts inside the ellipses). The three dividing lines, symbolised by different dashed lines, express the divergences and convergences between the different views in regard to their epistemological perspectives (realism v. constructivism), to the approach to the reciprocal effects on/from nature (impact v. process) and finally to two archetypal conceptions of nature (external and passive v. active and linkable). We consider the experienced-based approaches (in black in the figure) as relevant to exploring a diversity of new ways to relate to nature and go beyond the dead end of the debate around dualism.

separate from us is maintained and reinforced in certain functionalist approaches that seek to penetrate its mechanisms. This line also cuts through constructivist approaches. In contrast to this conception, experienced-based and relational approaches open up a wider field of possible conceptualisations of nature as perceived, discovered and felt in the course of our experiences.

These dividing lines clearly show that the diverse views are not structured through a strict opposition between the life sciences on one side and the social sciences on the other, which would immediately dictate two different ways of dealing with the relationship between humans and nature. First, epistemic communities within each of these two fields have sought to deal with human/nature relationships by borrowing concepts from the other field, as in ecologists' socio-ecological approaches or anthropologists' conceptualisations of nature as acting entities. Second, a number of recent approaches, such as those we have described as experience-based, rely on interdisciplinary approaches or even attempt to move beyond any specific discipline.

While ecologisation is often reduced to the problem of dualism (humans/nature, nature/culture, etc.), this mapping shows the many ways dualism is handled. Thus, we see that some views do not question the existence of dualism as such, but rather the implied relationships of opposition and domination. Moreover, some views, by claiming that nature should be considered as an independent entity that is separate from us, point to a need to maintain the human/nature dualism in some way. Setting up the debate in terms of dualism and opposition between ecocentric or anthropocentric perspectives is perhaps becoming outdated.

We feel that the experience-based approaches offer a relevant opening to make substantial and necessary progress in analysing and supporting ecologisation. First, these approaches can take us beyond a realist or constructivist understanding of the materiality of nature (the first dividing line in the figure, described above). The idea of experience means we can refer to different registers of perception without putting them on opposite sides, and to encompass the idea of experimentation, the feeling of the 'radical' physical and functional otherness of nature, and the experience of sensory-based relationships all at once. Second, experience-based approaches go further than the dichotomy of nature as an external and passive entity versus nature as an 'acting force' with which humans are 'in contact' (third dividing line above). This is because they consider ecologisation as a process 'in the making' through lived experience and experimentation of actions that support our links to nature, the effects and consequences of which can be collectively debated. This also leads them to favour an open-ended perspective with regard to change, and setting objectives and transition paths over a deterministic perspective (Magda et al. 2021). Finally, experience-based approaches overcome certain disciplinary divides by promoting an interdisciplinarity focused on sharing and comparing perspectives on the objects of nature, as opposed to encompassing approaches that aim to deal with both ecological and social processes (e.g. through modelling or multi-criteria approaches) or approaches that construct a response to the nature/society dualism within their discipline. For example, while actor–network theory develops this response by creating new categories (non-human beings, spokesperson, attachments, etc.), interdisciplinarity in experience-based

approaches creates a completely different type of response, emerging from the interaction between disciplines. In this case, a 'spokesperson' for the environment and non-human beings refers to the various disciplinary skills mobilised outside the social sciences, and not to a kind of 'unveiling' by sociology.

While our proposed mapping is above all an invitation to debate and criticism, this reading offers a tool for reflection to be used by scientists and actors involved in ecologisation, who could take it on and further define its contours and use. We tested it in a Master's programme in ecology, in order to help students become aware of the different scientific positions on ecologisation and to take a stance with regard to their own view of ecologisation. By helping to clarify the views of the different actors without opposing them in a binary way, we can go beyond the usual normative stances on the many views of ecologisation in the field of agrifood transitions. Future work should show that the diversity of these views plays an active role in the ecologisation process through collective learning.

## ACKNOWLEDGEMENT

This research was carried out within the Ecosyat project funded by INRAE through the Metabio metaprogram.

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