Working paper

6th International Conference of the BRICS Initiative for Critical Agrarian Studies

BRICS Initiative for Critical Agrarian Studies

The Good, the Bad and the Ugly of Agroforestry Practices

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Published by: BRICS Initiative for Critical Agrarian Studies (BICAS)
in collaboration with:
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Brasília, Brazil
Website: http://www.unb.br/

Universidade Federal do Rio Grande do Sul
Porto Alegre, Brazil
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Abstract

Ideally, in agroforestry one seeks approximating agricultural systems to natural ecosystems through the integration of woody perennials—trees of various types—and increasing the functional diversity of plants in agricultural systems. Such a multistrata-pluri-intensification of agricultural production can be done in myriad ways depending also the context of such activity. In fact, the variety of empirical agroforestry systems and practices is so massive that often the definitions of agroforestry have to be very loose to accommodate all such practices, so loose that sometimes it refers to nearly everything and therefore can be used to explain nearly nothing. The literature on agroforestry is already sizeable and the concept has gained legitimacy along with the proliferation of—also—academic research that shows persistently positive impacts of agroforestry practices to the local and global 'natural' environment and the people carrying such practices. The concept is, however, often loosely defined and is therefore vulnerable to cooptation and misuses by the powerful. In particular, labeling such practices as agroforestry that directly or indirectly stimulate deforestation of primary forests provides a disguise of legitimacy to carry on such destructive practices. One of the aims of this paper is to specify what agroforestry may be by discussing three ideal types of agroforestry: The Good, the Bad and the Ugly. By distinguishing and categorizing agroforestry practices, this paper helps to pave the way to identify and delegitimize such agroforestry practices that are harmful to the local populations, peasants, and/or biodiversity of the 'natural' environments. Furthermore, such an understanding can be used to promote cooperation-seeking alternatives to the current, yet competition-based paradigm. Part and parcel of such conceptual scrutiny is addressing the social and political dimension of agroforestry, which is typically absent from the natural scientifically dominated literature on agroforestry that typically focuses on the technique. It is argued that agroecology can bring such a sociopolitical dimension to the agroforestry research. Agroforestry, for its part, could offer agroecology *longevity*. Agroecology aims to bring a longer term vision to agriculture to replace the current short-sighted pattern and including trees in agriculture quite naturally stretches the time span of agricultural practices to decades or even centuries.

Keywords

agroforestry; agroecology; longevity; rural development; trajectories of intensification

1. Introduction

This paper scrutinizes the concept of *agroforestry* and proposes a categorization of agroforestry practices based on their environmental and societal impacts. Modern industrial agriculture is associated with harmful impacts, such as deforestation, land degradation, loss of biodiversity, increased risks of climate change, rural exodus, and rising levels of malnutrition. Scholarly research keeps showing that agroforestry, the purposeful growing of trees and crops in beneficial interactions (Nair and Garrity, 2012), provides a wide range of facilitative benefits answering to such insidious changes (e.g., Cairns 2007, Siminski etal. 2016). Agroforestry has been characterized as "an interface between agriculture and forestry" (Dagar and Tewari, 2017: 23), it is both and neither at the same time. Typically, in agroforestry, the farmer "seeks an approximation of agricultural systems to natural ecosystems through the integration of perennial plants and an increase of the functional diversity of plants in agricultural systems" (Schultz, 2011: 4). The literature on agroforestry typically focuses on the environmental, natural scientific or technical dimension of agriculture rather than the social sphere, which is typically left without much consideration. Hence, the broader societal, developmental and political aspects and effects of agroforestry remain little explored (Jerneck and Olsson 2013) and are discussed in this paper.

The concept and literature on agroforestry partly intersects with those of agroecology, permaculture and silvipasture. Agroforestry literature is essentially larger than the literature on agroecology; as of October 15th 2018, Google Scholar searches for 'agroforestry', 'agroecology' and 'agroecology and agroforestry' give 1 370 000, 87 000 and 17 000 items, respectively. As trees may be highly beneficial in different agricultural settings, agroforestry practices play a rather natural role in the literature on agroecology (e.g., Rosset and Altieri, 2017). This, however, is not the case *vice versa*. Therefore, what is discussed of agroforestry in the agroecology literature is covers only a part of the literature on agroforestry. Such agroforestry practices that are beneficial for both family farmers that engage in them and natural environments in which such practices are embedded—labeled here as agroecological agroforestry or agro*eco*forestry—constitute what is referred to as the Good of agroforestry, as will be elaborated. Agroforestry is, however, an umbrella term to refer to various types of empirical practices. For this, the label agroforestry, similarly as other terms that have gained legitimacy in terms of sustainable development, is vulnerable for misuses and appropriation by the capitalist interests—of expanding the commodity frontiers, in particular.

Indeed, labeling an activity as agroforestry provide means to carry on and spread bad and even ugly practices under the disguise of sustainability. Even though not always referred to as agroforestry, different sustainable logging schemes and practices that transform primary forests into parts of the commodity frontiers often recur to concepts such as agroforestry when seeking legitimacy. This paper understands such practices that help to further root and institutionalize other agricultural practices that are harmful for environment and society as the Bad agroforestry practices, that is, agroforestry harming the social and natural spheres indirectly. For example, trees may facilitate the reproduction and spread of unsustainable practices of cattle ranching by enhancing the productivity of animal ration. For its part, the Ugly agroforestry practices spur the deforestation of primary forests directly. By distinguishing and categorizing the Good, the Bad and the Ugly of agroforestry practices, this paper helps to identify and delegitimize such agroforestry practices that are harmful to the local populations, family farmers, and/or biodiversity of the natural environments. Furthermore, theorizing "the Good" empirical practices in Brazil grouped under the label agroforestry as *development strategies*, can provide cooperation-seeking alternatives to the current, yet paradigmatic competition-driven large-scale projects and strategies in Brazil and also in other BRICS countries.

Agroforestry

Just as there are vastly different forests in our planet, there are vastly different ways of using trees in agriculture: what is labeled as agroforestry might be almost anything spanning from growing eucalyptus to get timber and fuel to collect fruits from naturally growing trees in tropical forests while aiming to conserve the natural resources at the same time (Atangana et al. 2014). Some of the tree products are: “fruit, nuts, oils, beverages, gums, resins, latex, flavours, leaves for food and nutrition, fodder for livestock, timber, fuel wood and biomass for energy production, and medicines that treat disease” (ICRAF, 2018). Atangana et al. (2014) identify over 100 distinct agroforestry systems and different types of agroforestry practices ought to be counted in thousands. Not only are there vast range of empirical agroforestry practices, but also agroforestry has been defined broadly—and loosely. As an exemplar, Jerneck and Olsson "define agroforestry as a multifaceted, multicomponent and multiproduct activity with many purposes and benefits" (Jerneck and Olsson 2014: 115). Classically, however, in order for a practice to be identified as agroforestry—for ICRAF (The World Agroforestry Centre) at least—it has to beet two requirements: one has to deliberately grow woody perennials on the same unit of land as agricultural crops and there “must be a significant interaction

(positive and/or negative) between the woody and non-woody components of the system, either ecological and/or economical" (Dagar and Dewari, 2017: 22).

Agroforestry in its various manifestations seems to be a very positive concept, no one has much negative to say about it. The most critical stance comes from conservation biology who see particularly intensively managed agroforestry systems as harmful to biodiversity (Santos-Heredia et al. 2018). It is also clear that some shade tree species reduce yields of the crops they shade, even though they typically bring in other benefits to the farming system (Santos et al. 2012). A very general thrust in the literature on agroforestry is the benefits it brings, whether to the producer (farmer, peasant, etc.), environment (biodiversity), economy (increased returns) or to all (Shiba 2009). When agroforestry is studied in agricultural and life sciences, particular tree crops (e.g., Bost 2014) and other species (e.g., Santos-Heredia et al. 2018), land use changes (e.g., Verbist et al. 2005), effects of agroforestry on soil, and biodiversity (Marjokorpi and Ruokolainen 2003) are most often studied—increasingly as environmental services (McNeely and Schroth 2006; Dagar and Tewari, 2017). Indeed, agroforestry features prominently in ecosystem service projects, that is claimed to "provide a new platform for the old challenge of aligning conservation and development" (Tallis et al. 2009, 12). More recently, the potential of agroforestry in terms of carbon sequestration and storage, biofuels and climate change mitigation in more general have been a prominent focus (e.g., Agevi et al. 2017; Shiba 2009; Srivastava et al. 2012, Thomazini et al. 2015).

By virtue of it being an umbrella concept and its positive connotations, the concept of agroforestry is vulnerable of being coopted by the powerful. Similarly, as in the literature on agroecology that "has come to be *the* word used in debates about agricultural technology", Rosset and Altieri observe, "its exact meaning varies a lot depending on who is speaking" (2017: 1). The ambiguity of concepts ought to be specified so that to inhibit their misuses. Narrowing down the concept means also to be able to say something, because when a concept refers to (nearly) everything, it can be used explain (nearly) nothing. In addition to providing a categorization of agroforestry practices—the troika of the Good, the Bad, and the Ugly of agroforestry—this paper attempts to say something about agroforestry systems by pointing out the importance of the longevity of trees. The longevity of trees—the fact that the lives of trees span easily centuries—remains largely an undertheorized topic that deserves to be studied. Addressing the longevity of trees may help in one mission of agroecology in adopting "a long-term vision that sharply contrasts with the short-term and atomistic view of

conventional agronomy" (Rosset and Altieri, 2017: 48). In attempting to organize for longer time scales in developing rural territories, trees can be seen as natural elements of a transition towards longer term visions and genuinely sustainable food systems.

2. Assessing agroforestry practices

All the academic concepts are de-pragmatized knowledge that are always ambiguous. As concepts always generalize and typify the particular empirical cases and phenomena, there can be no one-to-one relation of a concept and empirical realm. This is clearly seen with regard to the concept of agroforestry. For instance, as written, Atangana et al. (2014) identified over hundred distinct agroforestry systems that are nevertheless all labeled with the same term 'agroforestry'. Even though concepts always remain ambiguous, concepts can be more or less strictly speficied. As agroforestry has been conceptualized loosely, one of the loosest being Jerneck and Olsson's "a multifaceted, multicomponent and multiproduct activity with many purposes and benefits" (Jerneck and Olsson 2014: 115)—entailing nearly anything—I find it important to narrow down the concept. The ambiguousness of the conceptualization makes that a term ends up referring to (nearly) everything and to (nearly) nothing at the same time.

Point of departure

Before going into describing the troika—the Good, the Bad, and the Ugly—of agroforestry practices, a few general words on assessment. All our measurements, also those assessing agroforestry are contingent on the point of departure. And the starting point in agroforestry can crucially differ, spanning all the way from degraded lands to primary forests. If a farmer adopts agroforestry practices in a depleted soil and landscape void of trees, then virtually any type of increase of trees—with a possible exception of plantations of eucalyptus with excessive use of agrotoxins—is typically beneficial for the soil and biodiversity. In the other extreme, if pristine tropical forests are harnessed even through very subtle enriching practices, at least according to the conservation biologists, the impact is typically deleterious to the priceless biodiversity. Furthermore, even tiny scale practices that succeed in extracting exchange value from the primary forests tend to attract more economic activities—at a larger scale—therefore impacting the forests ever more.

It is important to take the point of departure also into account when attempting to categorize which type of agroforestry practice we are dealing with. If we take agroforestry to be a such sort that begins from a field where mere non-woody crops are cultivated, then such practices tend to entail positive impacts on the context where it takes place and, on the people, carrying them. If we take agroforestry to begin with forests inhabited only by indigenous peoples, then however good and well thought the practices themselves are, measuring the situation before and after the establishment of such practices, their impacts tend to be negative to the biodiversity—not to talk about the indigenous people within. This seems to be the main argument of the conservation biologists: whatever (the Western) humans touch, it is destroyed. The more the forests are left on their own, the better they fare. However, if the alternative is not to let the forest intact, but to let it slip to logging schemes or cattle ranching, which is often the case in Brazil, then better do the agroforestry—with and in cooperation with indigenous people dwelling in the forests. Nevertheless, as a rule of thumb, in terms of primary forests, it is better to try to not suck into the capitalist realm.

Based on the above discussion, the varying embodiments of agroforestry can be approached from two points of view: one beginning from more or less conventional farming practices where no trees are grown and the other from the harnessing of existing forests to use in order to conserve them, that is, agroforestry as "a subtle way by enriching forests with useful plant species" (Schroth et al. 2004: 1). Most typically, examples of the latter can be found from tropical areas (where agroforestry practices have been part of the everyday for millennia) whilst the former type of agroforestry is linked to more recent agroecological or permacultural practices attempting to enhance and then harness the forces of biodiversity to subsistence and economic use and in parallel attempting to reduce the dependency of externally produced inputs. Also, such latter type of agroforestry can also refer to reforestation schemes where exotic species are planted in degraded or cultivated areas in order to gain REDD+ or other clean development mechanism (CDM) related income, but such practices are already closer to purely forestry practices.

Longevity of trees

Longevity of trees makes them as an interesting phenomenon that differs from the annual crops used in agriculture. Longevity of trees which makes agroforestry as an activity that inherently has a long-term perspective: instead of years, cultivation and use of trees expands the time scrutiny to decades, sometimes even centuries. It is certainly not always that any of particular tree

species within agroforestry settings are left to grow until even a decade, but they may be used in the starting phase, for instance, to provide shelter and prepare the soil for a particular crop or another species of trees. Fr example, in successional agroforestry the idea is to mimic natural forests when a shock or disturbance–such as clear-cutting or slash-and-burn–has occurred and involve different phases that aim at creating "multi-strata perennial polycultures [that] maximize available growing space, nutrient resources, and diversify multiple harvests per year" (Young, 2017: 192). Nonetheless, whether it is the longevity of trees or phases through which agroforestry is developed, the time span involved is always much more than a single year, nearly always much more than a decade. Certainly, also shorter term planning and activities such as planting, pruning, thinning, coppicing and pollarding (Young, 2017) are done in time-scales similar to the non-woody agriculture.

A decade, two or three begins to be a time span that involves changes in generations, which makes tree-cropping as a crucially important phenomenon in terms of intergenerational continuation of farming practices. What the longer time span involves, evokes and necessitates of in terms of agricultural systems has not been well studied within agroforestry studies. Time is also important since, as research has well revealed, older agroforestry systems tend to be much closer to the natural forests than younger ones entailing therefore more enhanced soil and other benefits (Marjokorpi and Ruokolainen 2003; Young, 2017). Agroforestry, hence, out to be brought to the fore as means of broadening the time focus of agricultural planning and practice. Such a focus makes land and its ownership and control even more essential, without land or under uncertain land tenure situations the focus is quite naturally in annual crops and in short term production, instead of trees that entail decades of time span and intergenerational planning or dreaming (Jerneck and Olsson 2013). The longer time span does not mean that farms under transition would only work when they have reached a mature state, but certainly the launch is the most challenging phase. Also, the workload is typically heavy in the launching phase, but it typically decreases proportionally "with the development of the perennial plants" (Schultz, 2011: 11).

Longevity that trees bring into the agricultural realm is a paramount issue and that has remained without explicit focus in social scientific agrarian studies. It is argued here that longevity and the focus on the lifespan of trees used in agriculture can be used to help assess the goodness, badness or ugliness of agricultural practices. In other words, the time dimension, the lifespan of trees, can be used to measure whether and how beneficial agricultural practices are to

the biodiversity and wellbeing of the ‘natural’ environment both within and around the particular agricultural setting. This is not to say that longevity is the only such measurement. The extant literature seems to be clear with that the longer particular agroforestry practices continue, the closer such agricultural setting gets to the naturally or freely growing forests (Schultz, 2011) or at least the greater the biodiversity is within such agricultural setting. The longer the particular agroforestry practices have been continuing, the more biodiversity they tend to contain (Young, 2017). In other words, while certainly agroforestry practices may involve in cutting old trees and planting new ones, the typical pattern one derives from the literature is that the older the agroforestry, the older trees in average live there.

Summing up, while agroforestry of the type 'from bald to hair' is less vulnerable to corporate take-over, different reforestation schemes have space for cooptation nevertheless. It ought to be seen that this type of agroforestry, however, provides with low risks a vast range of benefits to agricultural production. The most harmfully agroforestry can be coopted in the type 'modern hair-cut from long-grown hair' in which a naturally grown forest is—more or less—gradually taken over by economic interests in the disguise of sustainability. Such considerations, of course, only look at the 'natural' environment, not the social sphere, which is quite another question. The social dimension is a more complicated issue conceptually and differs greatly according to the particular society and rural area within. In other words, determining what is good in social terms, that is, for people is not that straightforward. It is, however, not the state of affairs, but the unfolding of distinct trajectories—contained in models, policies and practices that aim to develop rural areas—that can be assessed more accessibly.

Alternative models of development

In 2008, for the first time in 25 years, the prominent annual World Development Report focused on agriculture. While this report "marks an official end (at least in rhetoric) to one-size-fits-all approaches" (Oya 2009, 594), according to Veltmeyer (2009, 394), it failed "to break out of the old development paradigm of modernisation theory" and to critically examine a more inclusive, participatory and equitable form of development. While currently structuring the agrarian policies of the majority of nation states, a major controversy with such models is that “they do not necessarily have to be ‘true’ in order to be applied and implemented” (van der Ploeg 2012, 14). For instance, what Islam and Madsen state, “Low agricultural productivity remains the primary source of poverty in the developing regions” (Islam and Madsen 2018, 265) just is not true, but it keeps

taken as given and for granted by many. Indeed, such knowledge is depragmatized knowledge (Schutz and Luckmann 1973) that is based on evidence from a particular place and time, which is often distant from contemporary situations in the ‘full’ or cultivated planet (Foley et al. 2011).

For rural areas, the 'conventional' developmental model implies a selection process through which the fittest survive and the resources of the rest are used to strengthen the fittest. Furthermore, the remaining fittest are transformed into modern farmers and embedded into global value chains through technologically driven intensification involving the intensive use of chemical inputs, fossil fuels, scale-enlargement, monocultures, specialization and mechanization (Akram-Lodhi 2008; McMichael 2008; Putnam et al. 2014). Thus, "dominant development policies have tried to transform peasants into something else: industrialised commercial farmers, wage labourers, urban workers, etc." (Naranjo 2012, p. 231). Relevant problems for agronomy are governed by broader political economy discourse (Feldman & Biggs 2012): "the creation and use of knowledge and technology—which are of course at the heart of agronomy—are embedded in complex political, economic and social worlds that are characterised by asymmetric power relations" (Sumberg et al. 2013, p. 81). The dominant paradigm "tends to focus on enhancing production through technological change that leaves questions about the changes in the environment, consumption, and distribution to researchers outside of the agricultural sciences proper" (Feldman et al. 2010, p. 66, see also Biggs 1995; Raina 2003; Weis 2007). It has been long argued that "the reductionism of the actually existing science is not adequate to the task of achieving a sustainable agriculture" (Kloppenburg 1991, p. 531).

The rationale for studying agroforestry is the need to provide alternative ways to use territories that are today given to or grabbed by deforesting projects, especially in terms of the native forests, but also in terms of degraded and arable land (Leakey et al. 2005). Recently the function of forests as carbon sinks has further increased the discussion of agroforestry practices (Agevi et al. 2017; Montagnini and Nair, 2004). At the policy level, the diffusion of tree-based agroecological practices can be seen as a strategy through which agriculture can be sustainably intensified in a decentralized manner (Siminski et al. 2016). Among other things, agroecological, sustainable intensification of agricultural production including trees—agroecoforestry—would mean to reduce the dependence of small-scale farmers of externally produced inputs. Such a process is tantamount to increasing their autonomy vis-à-vis the system, which translates to increasing the political power of the peasantry – one means to

democratize the Global South, where the livelihoods are yet massively leaning on small scale agriculture (Rosset and Altieri, 2017).

Trajectories of intensification

A crucial issue in transforming our food systems is the way that agricultural production is attempted to be increased. A consensus is being established regarding the need to intensify rather than expand agricultural production to new areas (Foley et al. 2011; Godfray et al. 2010). Intensifying the production per unit of land (land productivity) can occur through many different ways. Van der Ploeg (2008) argues that different modes of agricultural production intensification tend to take through distinct *trajectories of intensificatio*n, which Van der Ploeg distinguishes between technologically driven and socially driven intensification (van der Ploeg 2012). The former type, by far the dominant form of intensification, depends "on the external providers of the required inputs, instruments and machinery"—the key aspects of technologically driven intensification (van der Ploeg 2012, p. 446). Most agricultural research, however, works with the underlying aim of providing the means to improve yield-per-labour through new technology (Feldman & Biggs 2012) and has resulted in the introduction and elaboration of high-yielding varieties, chemical fertilisers, genetically manipulated organisms, monocropping, heavy mechanisation and automation (van der Ploeg 2012).

Problems evoked by technologically driven intensification have stimulated scholars to promote *sustainable* intensification (Pretty 1997; Pretty et al. 2011). The term socially driven intensification refers to intensification that is a function of quantity and quality of labour and leans on experience, knowledge and skills of producers (van der Ploeg 2012). The term socially driven intensification is rarely used in the literature. However, when Foley et al. (2011, p. 340) argue, "Better deployment of existing crop varieties with improved management should be able to close many yield gaps", they refer to such a type of intensification. From a conceptual viewpoint, socially driven intensification solves many problems in rural development. First, it requires little or no capital from farmers and hence, would suit the resource-poor farmers. Indeed, the low cost of innovative practices and employment of locally available resources (Koohafkan et al. 2012) cannot be emphasised enough when thinking about pro-poor policies. Even if credit would be readily available, it very often turns out to reinforce the existing unequal relations (McMichael 2013). Paying something with credit as compared with savings is distinct with regard to autonomy (van der Ploeg 2008). Hence, embracing low-cost, socially driven intensification could

help to intensify the production of the poorest while avoiding the entering into debt relations that are especially problematic as they tend to increase the extant, often acute, asymmetries in which poverty is largely rooted (Gerber, 2014; McMichael 2013).

Second, the central aim within socially driven intensification is to improve soil fertility and the health of soil ecosystems (Altieri 2002), thus reducing the need for external inputs (FAO 2011; Gliessman 2013). There is a strong underlying assumption that natural processes cannot deliver enough nutrients and cannot control against pests. However, while this has been proven wrong on various occasions (Rosset and Altieri, 2017), a major issue is that without incentivizing research regarding such processes and methods, advances are likely to be slow and their importance undermined by the conventional research (Robertson & Swinton 2005). Third, such intensification is driven by labour, aiming to increase yield-per-area, rather than yield-per-labour (de Schutter 2010). It is important to note that most of the work done in agroecological farming is done by the nature itself (Rosset and Altieri, 2017). However, engaging in socially driven intensification would not expel people to already full urban and peri-urban areas, where they would find themselves from slums without well-paid work in industry or service (Davis 2006)—as contrasted with what the modernisation paradigm assumes (Li 2011). Hence, such intensification could contribute to develop rural areas to 'become places where people want to live and do business' (van der Ploeg 2012, p. 441).

Cooperation vs. competition

Part and parcel of agroecoforestry is that peasant is not transformed into something else, remain such yet gradually enhance their conditions through socially driven intensification that entail also tree growing practices. A major requirement of peasants remaining such is that the survival of the fittest is abolished. The competitive setting that entails selection through varying means could be dismantled through cooperative arrangements of different types. In practice, when people having different roles in agricultural setting have a say of similar weight over time on common issues, they typically cooperate rather than compete. What seems to be clear is that the smaller the scale of the practices, the better they are in distributional terms. The larger the scale of activity, the more hierarchy there tends to be, which typically leads to social stratification and inequality. However, as seen in different parts of coffee production, cooperative power is needed in dealing with larger, even global supply chains and powerful actors within including the states (e.g., Wollni and Zeller, 2007). Decentralized

production systems require something centralized and this is typically something that can be succeeded through cooperative arrangements. A cooperative structure that granting a say, whatever the situation, allows for common participation and mutual aid.

3. The troika of agroforestry

the Good

The Good of agroforestry refer to practices that enhance the overall biodiversity of the local environment and gradually increase the average age of cultivation. Biodiversity is not, however, the only and not necessary the most important dimension in assessing the goodness of agroforestry practices. The discussion on agroforestry, however, typically lacks the explicit focus on the social element. What is understood as Good here is, in fact, rather adequately contained in the concept of agroecology. Since there are various distinct meanings of the term in the literature, what is here referred to as agroecology is that stream of the literature that sees agroecology as “a science that carriers an ecological and social ethics with a research agenda of creating nature friendly and socially just production systems” (Rosset and Altieri, 2017: 48) and not just narrowly and de-politically as techniques of farming. Agroecology, hence, ought to be seen as having “a strong political element that is inseparable from its technical-biological aspects” (Rosset and Altieri, 2017: 1).

Agroecology refers to a broad set of practices having as their common aim the improvement of yields in a sustainable manner by abolishing external inputs, addressing soil fertility and pest control through biological and in-farm methods and cultivating various crops simultaneously (Bernstein 2014; Schneider & McMichael 2010; Wezel et al. 2009). In agroecology, one major aim is "to replace external inputs of chemicals with knowledge-intensive practices that make use of natural processes" (Röling & van der Fliert 1994, p. 97). Agroecology is a multidisciplinary approach that "has accomplished a major stride in sustainable agricultural development by seeking the conditions of empowerment for the bulk of resource-poor, small-scale farmers in developing countries from holistic perspectives of agricultural sustainability" (Amekawa 2011, p. 120). It not only entails socially driven intensification and research supporting such intensification (Tomich et al. 2011), but many also see it as a social movement (Wezel et al. 2009).

Contrary to that often seen, agroecological farming practices are not labor-intensive per se (Rosset and Altieri, 2017). Instead, they efficiently make of use biological processes, nitrogen fixation, solubilisation of phosphorus and biological activity; that is, they are used to harness natural processes in farming (Altieri et al. 2012). This is especially strongly seen in agroforestry (Schultz, 2011). However, agroecological practices do "require extensive participation by farmers for further development through on-farm experimentation and collective learning" (Arora 2012, p. 207) so that one-size-fits-all-approaches for diffusing agroecological practices cannot work similarly to the diffusion of homogenous technologies within industrial agriculture (Coe et al. 2014; Feldman & Biggs 2012). Not only have practices been locally adapted, but learning typically takes another form between farmers themselves and between farmers and extensionists, researchers and supporting organizations (Arora 2012).

Here, so called agroforestry practices are labeled as *agroecoforestry*. Note that due to the contextual contingency, we can rarely find genuinely good agroecoforestry in regions that used to be primary forests (immediately before their transformation to agroforestry). The most typical empirical manifestation of Good agroforestry practices is such in which peasant or small farmer begins the transformation towards agroecological practices—that entail trees. The most obvious target of such agroecoforestry practices are degraded or land areas with challenging water and climatic conditions that such practices can help overcoming. As agribusiness companies rarely plant their eucalyptus and other (mono)cultures to depleted lands, but instead to fertile ones, empirical agroforestry initiatives in depleted soils tend to belong to the category of Good.

the Bad

Studying narrowly farming, farming techniques or agricultural practices is not enough, but the rural realities should be conceived of in their entirety (Bernstein 2014). Hence, even though agroforestry practices such as using a small, fast-growing mimosoid tree, leucaena leucocephala—or river tamarind, jumbay or subabul—as an animal ration that does such task much better than any annual crop, does not necessarily make it a Good practice. Indeed, it may only help unsustainable practices- here cattle ranching - prosper and root them even deeper in the rural areas. In Brazil, river tamarind has been tested and increasingly used as a ration for cows, as it has proven to be not only very productive, but also bringing other benefits to the farmer and the soil. The issue with such agroforestry practices is that, taken alone, such production is clearly positive. But when looked from the point of view of an entire territory and what

type of practices prevail there, it is not without problem that such a practice makes it easier to reproduce cow pastures that themselves have massive environmental impacts. This is particularly so in terms of larger scale production. In small scale activity, it is certainly not that Bad to use any agroforestry techniques that have positive impacts on the natural environment and help sustaining the farm.

It is therefore not that straightforward to define Bad agroforestry practices as such that do not alone or directly produce detrimental impacts, but through their interactions with other practices. In distinguishing the Bad practice, the scale has to be taken into account intrinsically and the territorial trajectories such agroforestry practices entail. Nevertheless, the Bad agroforestry practices help to maintain and grow other agricultural practices that have harmful impacts on both the 'natural' environment and the rural social sphere—typically in terms of spurring inequality under the competitive arrangements of the rural producers. Such practices ought to be seen as highly legitimate in the mainstream agronomy and agricultural economics, since they do not attempt to alter the system, but instead help in its propagation. Helping to boost a system that is unsustainable in various fronts, is of course not helping in directing human activities to genuinely sustainable direction. In so far as agroforestry practices play a part in the winner takes it all patterns of development, even indirectly, and help propagating the large-scale patterns of development, they may be distinguished as Bad practices.

the Ugly

Conservation biologists and other environmentalists typically view pristine forests as pristine, beyond any calculable price, as any monetary value is not commensurate with the living web of life. Against such a take on tropical forests, we can view the Ugly of agroforestry as such practices that *de facto* end up destroying the primary or 'pristine' forests, regardless of their pronounced intention not to. Such ugly practices refer primarily to legitimated schemas such as sustainable logging (Kröger 2018)—often referred to as agroforestry practices—that end up transforming pristine forests into some sort of plantations of cacao, açai or even eucalyptus or oil palm. But also, subtle ways of enriching forests with useful plant species (Schroth et al. 2004), that may not appear at all as ugly, may end up doing a similar thing, that is, putting an end to a primary forest by transforming it to an inhabited and increasingly 'civilized' area and suck it gradually into the capitalist relations of production. It is of particularly sensitive issue to begin economic activity within a vicinity—or within—primary forests,

because such practices, whenever successful in creating local income, can often be multiplied and lead to large-scale interventions in these primary forests. The larger the interventions, the less it is typically possible to actually conserve the primary forests under intervention.

The Ugly of agroforestry refers then to such practices—labeled as agroforestry—that end up transforming the primary forests into something else, not distinguishable as primary forests, that are gradually turned into the commodity frontiers of capitalism (Moore, 2017). Due to the prominence of environmentalists' and conservationists' claims on biodiversity in the Amazon, Borneo and other sanctuaries of biodiversity, such practices may not have the—explicit—explicit blessings of the mainstream agronomy and agricultural economy nor that of the transnational companies. The Ugly practices are typically disguised behind certificates of different types that are manufactured by different round tables chaired by the same transnational companies that either carry themselves the Ugly practices or, more often, buy the produce of the smaller producers that do the dirty work. In such a way, the destruction of the Amazonian and Bornean forests continues under the disguise of sustainable palm oil, sustainable soy and what (sustainable) not.

4. Conclusions and discussion

Agroforestry, as discussed, is an ambiguous and often loosely defined concept, but even more so there is a vast variety of agroforestry practices in the world. If we want to assess the goodness (not feasibility) of agroforestry practices—as well as other rural activities—we ought to understand such practices against the background of the context they unfold and as a part of the history of that context. It is essential to assess the point of departure of agroforestry practices, particularly so because of the vulnerability of primary forests under the current paradigms (Kröger, 2018). Part and parcel of such conceptual scrutiny is to address the social and political dimension of agroforestry, which is typically absent from the natural scientifically dominated literature on agroforestry that typically focuses on the technique. It is argued that agroecology can bring such a sociopolitical dimension to the agroforestry research. Agroforestry, for its part, could offer agroecology *longevity* as it aims to bring a longer term vision to agriculture to replace the current short-sighted pattern (Rosset and Altieri, 2017). This is because including trees in agriculture quite naturally stretches the time span of agricultural practices to decades or even centuries. In this paper—work in progress!—the Good agroforestry practices were associated with agroecological

principles that aim not to undo the category of peasant, but provide cooperative settings in which to agroforest practices could be flourish over generations.

If the concept of agroforestry is taken broadly, for instance as “a multifaceted, multicomponent and multiproduct activity with many purposes and benefits" (Jerneck and Olsson 2014: 115), it entails nearly everything. Even though such a broad take on the concept may be of use in promoting the use of trees in varying ways in different agricultural settings, there is danger of being coopted by the powerful, similarly as in the discourse over agroecology, and end up incentivizing socially and environmentally harmful practices. Therefore, it is important to be aware of what type of practices may dwell under the label agroforestry. The safest way to endorse and incentivize agroforestry practices is to start planting trees on depleted or degraded soils. Another safe, yet more controversial, target for agroforestry practices are such primary forests that are under threat of being deforested by virtue of the expansion of the commodity frontiers (of mines, soya, large hydropower or pastures typically in Brazil). The former type of areas can increasingly be found from the northeast of Brazil (Young, 2017) and also from the previously cultivated areas of soybean that suffer from “general lack of biodiversity on soil degradation through wind and water erosion, SOM depletion and nutrient loss” (Wingeyer et al. 2015: 2235). As understood here, the aim of agroecoforestry is not to abandon the indigenous knowledges, but on the contrary, to help to legitimize the indigenous political ontologies and the associated human relations with the nature. It is not enough to know about the wide range of benefits of agroforestry, as land use depends on politics, taken for granted underlying cosmologies, and ethics of alternative uses of territories, framed in terms of development. Building momentum towards agroecoforestry needs politicization, mobilization and education based on knowledge and consciousness.

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