

# **A Latin American perspective to agricultural ethics**

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**Abstract:** The mixture of political, social, cultural and economic environments in Latin America, together with the enormous diversity in climates, natural habitats and biological resources the continent offers, make the ethical assessment of agricultural policies extremely difficult. Yet the experience gained while addressing the contemporary challenges the region faces, such as rapid urbanization, loss of culinary and crop diversity, extreme inequality, disappearing farming styles, water and land grabs, malnutrition and the restoration of the rule of law and social peace, can be of great value to other regions in similar latitudes, development processes and social problems. This chapter will provide a brief overview of these challenges from the perspective of a continent that is exposed to the consequences of extreme inequality in multiple dimensions and conclude by arguing for the need to have a continuous South-South dialogue on the challenges of establishing socially and environmentally sustainable food systems.

Keywords: food ethics; extreme inequality; food production; land use; rural development; agrobiodiversity

## **Introduction**

Latin America is a highly diverse region. In terms of natural environments, we find both the driest desert – the Atacama Desert – and the most biodiverse area in the world – the Amazon rainforest. While the region hosts two major centres of origin, safeguarding an enormous variety of vital landraces for humanity (Kloppenborg 2005), it also maintains some of the largest monocultures of genetically modified soy fields in the world (Arancibia 2013). Culturally, this region in the Americas and Caribbean consists by definition of the countries and dependencies where Romance languages are predominantly spoken (Lolas 2014b). Yet especially in the countryside, this apparent homogeneity is vastly enriched by an enormous number of indigenous languages and regional dialects. The area embraces traditional, mixed and fused cultural heritages from indigenous communities, colonizing nations, decedents of slaves and multiple immigration waves. Politically, the region unfortunately shares a long history of abuse of power, disregard for human rights, discrimination, corruption, foreign intervention and military coups, making the need to build trustworthiness in political institutions crucial, as the number of disappeared, tortured, enslaved, raped and murdered people reaches several thousands in most Latin American countries. Socially, we find mixed progress. A few countries in the region stand out for already having elected a few women as heads of state and for having above world average female political representation (Rein Venegas 2013), yet at the same time the region also holds some of the most alarming rates of violence against women in the world (Bott et al. 2012). As far as the representation of indigenous peoples goes, we find similarly diverging images. Despite that an indigenous president took in Mexico already office in 1858, only a very small number of persons who have identified themselves as members of indigenous communities have been elected as heads of state ever since. Discrimination and human rights violations against indigenous peoples and people of Sub-Saharan descent is still rampant. The region has had little success in reducing its very high rates of violence and homicides. In terms of urbanization, we find here a number of the largest cities in the Western Hemisphere and also some of the least populated areas of the world. Economically, we encounter a wide spectrum of development stages. Latin America characterizes for having extreme inequality both within and between countries. While Chile and Argentina are listed among the countries with a very high human development, Haiti remains as the only country

ranked under “low human development” in the Americas (Jahan 2016). The differences in income and infrastructure, are not only tremendous between rural and urban areas, but even within the same cities.

On what food production concerns, as a region Latin America and the Caribbean produce sufficient food to feed its entire population. Unfortunately, despite major advances in addressing the right to food, poverty still makes food inaccessible for the 37 million people (6.1% of the population) who suffer hunger (FAO 2018). The problems of poverty are further aggravated by the level of extreme inequality in the region, which are together with Southern Africa the highest in the world (Jahan 2016). Extreme inequality also hinders a diverse participation and adequate political representation (Di Castro 2010), and facilitates exploitation, corruption and unfair competition, with disastrous effects for rural people and nature. Improving continuous access to adequate food demands therefore solutions of a political nature.

These realities bring about a number of problems and opportunities for addressing social justice and protecting nature. In this chapter, I can only focus on a few of the most notorious challenges for the region and their ethical questions. I proceed in discussing (1) the problem of extreme inequality and the strive for food sovereignty, (2) the pursuit of agroecology and the problem of coexistence in agriculture, (3) the challenges of securing adequate food, (4) the mission of maintaining diversity and (5) the need to make food systems more resilient. As a conclusion, I defend the necessity and benefits of a South-South dialogue.

### **Food sovereignty and extreme inequality**

A series of trends have triggered a large discontent among food producers and consumers on how agricultural policies and trade agreements are being drawn and on how the law is being enforced. People are particularly worried about large scale land grabbing, the lack of consultation on agricultural and food policies, the violation of land workers’ rights, the loss of heritage varieties and insufficient space for alternative food production methods (Baquedano Jer and Larraín 2015). Farmers organizations in Latin America have been particularly strong in organizing themselves and raising their voice. A major movement pursued by these farmers is the fight for food sovereignty (Altieri and Toledo 2011).

The idea of food sovereignty consists in a series of demands, on seeking a right to produce food, to participate in the design of agricultural policies, to end systematic violence in rural areas, to empower farmers (especially female and indigenous farmers), to improve rural infrastructure and to provide fairer access to land, water, credits and technical assistance (Nyéléni Forum for Food Sovereignty

2007, Via Campesina 1996). To realize food sovereignty a series of reforms need to be implemented, some which will encounter fierce opposition, as is the case with the redistribution of resources and the democratization of decision-making mechanisms (Barkin and Lemus 2016).

As far as the redistribution of resources goes, it is self-evident that food cannot be grown without land and water. Yet especially under extreme inequality, these two resources are being seized at grand scale, threatening the existence of smallholders. Water is becoming increasingly scarce not only because of its increasing demand, but also due to lower precipitation rates caused by climate change (McMichael 2017). Land grabbing needs to be understood broadly to identify the different factors that are contributing to the reduction of the number of farms (Giraldo 2018). One form of land grabbing is the large-scale acquisition of land and waters for investment purposes and as foreign reserves. A second form of land grabbing is to change the use of the land, particularly to move from food production for the local population to the production of export cash crops – most alarmingly the cultivation of soy for animal feed and crops for biofuels. According to 2014-15 numbers, in Argentina 52% of land under cultivation was used to grow soy, of which 96% was exported (Leguizamón 2016). Here we should also list the effects the production of drugs and the war against them is having on the region. The cultivation of coca, cannabis and poppy is demanding vast areas of land, water and labour. The criminalization of drugs production brings the destruction of these cultivars and impulses drug cartels to take new lands for their production, usually expelling, tormenting or even murdering non-complying farmers. Alone the cultivation of coca bushes occupied in the year 2014 a total 132 thousand hectares in Bolivia, Colombia and Peru, while the same year 110 thousand hectares were eradicated (United Nations Office on Drugs and Crime 2016, annexe v). As a comparison, to visualize the magnitude of such areas, the cultivation of 141 thousand hectares of vineyards make Chile one of largest wine producers of the world, providing legally protected jobs and paying taxes (ODEPA 2018).

The rural population often feels that they are not sufficiently and adequately consulted on agricultural policies (Carro-Ripalda, Astier, and Artía 2015). Food sovereignty advocates claim that agricultural policies favour mostly large landowners and multinational corporations, and that such policies need to be redesigned so that they also benefit smallholders. This would require a right to protect local markets and prohibit the use of particular technologies, especially genetic modification (Nyéléni Forum for Food Sovereignty 2007). A special concern is how these technologies end up putting farmers in a position of dependency, with debt as a common consequence, ultimately obliging farmers to sell their land and labour. Inadequate agricultural policies have had the result that a number of Latin American countries that had a strong tradition of being food exporting countries

ended up as net food importing countries over the last decades (Lara Cortés 2001). Mexico, for example, had to import in the year 2012 approximately 30% of maize, 58% of wheat and 82% of rice to cover domestic needs (Escalona-Aguilar et al. 2015).

Food sovereignty raises important ethical questions. While at first sight the right to self-determination is something one should welcome from an ethical perspective, there are some special considerations about ethical responsibility that need to be attended when environmental resources are in play (Villarroel 2013, Lecaros Urzúa 2013). The resources needed to grow food, particularly water and land, are of limited supply. Moreover, food is a basic human need. Current population size together with existing land distribution arrangements make it impossible to be unconcerned on how land is cultivated. People who are not involved in food production have a strong interest that food production systems function efficiently and cost-effectively. There is a huge political pressure to make food cheap (Patel and Moore 2017). A number of organizations and food activists are also demanding more sustainable farming systems, in the interest of conserving nature and not jeopardizing future food production capabilities (McIntyre et al. 2009). These three societal interests – access to affordable and adequate food, environmental sustainability and the maintenance of future food production capacities – need to be balanced with whatever diverging interest food producers may have.

To defend their interests, farmers' organizations that seek political support will have to advocate for education campaigns to teach the non-food-producing population about the true social and environmental costs of food production (Timmermann, Félix, and Tiftonell 2018). There is an increasing awareness that food production is a sector where workers are exploited in large numbers and intensity (Raynolds 2014). Many are also suffering from the health consequences of agrochemicals. Farmers have first-hand experience on the environmental and health impact of conventional agriculture; it would be unwise and unjust to ignore their testimony.

To improve agricultural practices for people and nature two of the leading agricultural ethicists, Paul B. Thompson (2015) and Michiel Korthals (2004), have defended the use of a deliberative approach to improve ethical decision-making. Inspired by the work of Jürgen Habermas, the key idea of such approach is to organize meetings with the key stakeholders, representing the interests and opinion of experts, consumer groups, farmers, retailers and environmental organization to discuss the concerns and demands of all the affected groups, identify priorities and come to a consensus. Since most the urban populations has lost its link to food production venues it is becoming increasingly important for such public deliberations to be linked to education campaigns that improve people's food

literacy. Food producers on the other side, will have to commit to learn about the nature of collective action problems, the shared benefits of environmental regulations, the concept of the human right to adequate food and basic ecological principles. This knowledge is crucial to make sure that dialogues between experts, consumers and food producers are built on an adequate understanding of social and environmental needs and challenges. In the Latin American context it is particularly important to include in such discussions any affected indigenous communities and make sure that discussion forums do not perpetuate historical injustices (Barkin and Lemus 2016). Action needs to be taken against discrimination and training programs need to be established to empower indigenous leaders and historically underrepresented groups so that they can take part in such discussions as peers of equal standing.

### **Agroecology and coexistence agriculture**

A farming system that counts with an enormous intellectual and biological contribution from Latin American farmers is agroecology (Altieri and Nicholls 2017). As a principled based approach to agriculture, agroecology seeks to substitute external inputs with locally produced inputs, prevent nutrient run-off and embed food production units into the larger social and ecological environment (Gómez Echeverri, Ríos Osorio, and Eschenhagen Durán 2017).

There are numerous non-ecological advantages of this farming system. By working with biodiversity this system allows for a wider nutritional diversity among farm workers, thus reducing malnutrition (Altieri 2003). The diversification of crops also distributes work more evenly throughout the year, as these farms have multiple harvesting periods. Agroecology can thus offer better throughout the year employment, improving work quality and reducing the need of a migrating workforce (Timmermann and Félix 2015b). Moreover, a considerable amount of agroecological principles are built upon traditional ecological knowledge, which has been tested over a prolonged period of time (Tittonell et al. 2016). By building on the knowledge of indigenous peoples agroecology facilitates the recognition of their intellectual standing and contributions (Waldmueller 2015).

Many plants, animals and insects which provide crucial ecosystem services to agroecological farms are vulnerable to agrochemicals used in conventional agriculture. Moreover, farmers who use organic agriculture methods are only able to sell their produce in specialized markets at a premium rate when their harvests have not been contaminated by residues (especially from genetically modified crops) from nearby conventional farms (Robaey 2016). To allow for the coexistence

of both farming systems regulations need to be in place to avoid contamination and maintain the delivery of ecological services.

Coexistence in agricultural practices and ways of life calls for a series of ethical questions. What is the value of providing room for multiple methods of working the land? Should we support this coexistence even if agricultural land could be used more efficiently? As the efficiency of agroecological farming practices is continuously put into question (Tittonell 2014), defending diversity among farming systems becomes much stronger if we also spell out the different social and ecological benefits of such diversity. One of the strongest advantages of having diverse production systems is that this diversity widens the possibilities to participate. About a third of the world's population are smallholders, which makes the development of farming systems that function with local resources and local know-how a necessity to foster inclusion, assure food entitlement and improve welfare.

Another approach to defend coexistence in agriculture is to identify any agricultural practice that directly jeopardizes the livelihood of other farmers as a form of harm. Unfortunately, while a non-harm principle is widely accepted, the implications of such principle are all but clearly defined. Among the most widely accepted forms of harm are spills of agrochemicals in above normal use concentration, caused for example by leakage or accidents. Yet in practice, especially when the negative effects of such agrochemicals are felt in distant locations or with a significant delay of time, taking responsibility and holding accountable diminishes. More debatable is interpreting the reduction of opportunities as a form of harm, for example, when being invaded by pollen from genetically modified organisms from neighbouring farms and thereby losing the option to export a product to a country with a zero-tolerance policy against traces from genetically modified organisms. Ethics comes in hand by assisting in the identification of different notions of harm, in spelling out the importance of reaching a consensus and insisting policy makers on the need for regulations.

### **Adequate food**

Trade agreements, which have established an economic environment that strongly favours large-scale farms and retailers of processed foods, are having a disastrous consequence for adequate nutrition. A radical example is Mexico, with a skyrocketing increase in the rates of obesity and malnutrition after the North American Free Trade Agreement (NAFTA) came to force in 1994 (Loría and Salas 2014). In a number of cases these obesity rates were justified by claiming that the

local population had a genetic tendency for obesity, ignoring the fact that such a development is recent and unprecedented (García-Deister and López-Beltrán 2015).

However, when analysing the problem of obesity and malnutrition, we should not forget the various factors that influence people's eating behaviour. As justified as the accusations regarding the inadequacy of trade policies may be, these do not fully explain the recent changes in eating behaviour. To understand the causes of obesity and malnutrition we need to look at both individual and social factors, only then can we design effective public policies (Lolas 2014a). Here a number of additional causes can be listed. Extremely low wages, something that to be fair has even been condemned by wealthy trading partners, not only oblige the poorer population to feed themselves with cheap calories but has invited government policies that press farmers to produce food at low costs, often at the cost of workers' rights and the environment. Another factor is the combination of poor education, weak regulations and deceiving advertisement, which increase the demand for processed food, especially in cases where traditional nutritious recipes fall into oblivion. The mix between excessive weekly working hours, as we see in Mexico and Chile, and living in large urban agglomerations with poor transportation infrastructure and unsustainable driving habits, leaves people with insufficient time to regularly procure food in local markets and to prepare meals that meet their physiological needs and social traditions.

In terms of overall food security, despite the fact that large improvements have been made, climate change, crop failure, slow emergency relief programs and urban poverty are still responsible for a considerable amount of hunger and malnutrition. The eradication of hunger and malnutrition, as major sources of suffering and impediments for human flourishing, are among the most urgent global tasks. Reducing hunger in the present not only saves massive future human suffering, but also economic costs, which are massive. In Guatemala, for example, the costs of hunger are calculated to be around 11.4% of its GDP (Vivero-Pol and Ramírez 2009). It has been estimated that the costs of eliminating hunger are at least ten times smaller than the cost existing hunger causes (*idem*).

From an ethical perspective, the priority of fighting hunger is widely defended (Thompson 2010). As a source of suffering, utilitarianism strongly condemns hunger. As a policy recommendation, such reasoning demands that any international agreement is only to be signed if it also improves the situation of the least advantaged. The right to food is a human right and is defended by most rights-based approaches. Here we should keep in mind the human right to food not only covers absence of hunger, but a right to adequate food (De Schutter 2011). To do justice to the element of "adequacy" within food politics, people need to have a voice in decision-making and have the real freedom to choose. It is clear, that without a



serious commitment to reduce the current levels of poverty the full scope of such a right remains unfillable (Dieterlen 2003).

In what food adequacy concerns, ethics can be a supportive tool to reveal misplaced incentives. Private profit seeking activities, such as the selling of highly processed foodstuffs that use excessive amounts of salty, sweet or fatty ingredients to trick the eater's senses (Pollan 2008), can lead to huge profits while inflicting massive costs on public welfare, including individual suffering and public health expenses. Here we can observe a hidden tragedy of commons problem: while the benefits of aggressively selling such foods are fully grasped by private companies, the costs of the corresponding changes in diets are paid by the public at large. Once this outcome is identified as parasitic, proper regulation can be placed to either internalize the cost of these business practices, create adequate food labelling or even prohibit certain industry practices altogether.

### **Seed and culinary diversity**

Latin America hosts two of the five major centres of crop origin, contributing to a radical change in the world's alimentation, through the propagation of maize from the Mexican and Central American highlands and potato from the region in and around Southern Peru (Kloppenburger 2005). These two centres, together with later cultural exchanges, have made the region into a culinary and agrobiodiversity hotspot. The cultural heritage inherited from our pre-Columbian ancestors, colonizing nations and former African slaves have led to a huge diversity of culinary and agricultural traditions. This heritage has been further expanded with the contributions from more recent immigration waves coming mostly from Europe, East Asia and the middle East.

This cultural heritage enriches peoples' lives. It also still holds a number of underexplored alternatives for sustainable food consumption. The recent popularization of Quinoa from its Andean homeland to the world's slow food tables is a well-known example. The region also maintains European traditions who have felt in disuse in the continent. It also holds a number of potentially sustainable protein alternatives for the future, as we can observe with the still widely consumed edible insects, such as the chapulines and maguety worms that were identified by Mexican indigenous peoples (Ramos-Elorduy 2009).

Unfortunately, the stewardship and conservation of this heritage involves massive costs. Landraces holding unique varieties that are crucial for future breeding need to be conserved, requiring the establishment and enforcement of policies that prohibit changes in land use and hinder the introduction of varieties and species of invasive character. This involves both actual and opportunity costs.

Traditional knowledge needs to be documented and the involvement with traditional practices need to be encouraged to avoid the loss of tacit knowledge. Many regions have established for this purpose special fairs and commemoration weeks to popularize local culinary heritage and seed varieties. However, government policies should be careful that rapid popularization does not lead to unsustainable exploitation, endangering the livelihood of the communities who have stewarded these resources and sometimes even driving these resources near extinction.

An important ethical question is how this diversity should be treated. While some communities see this heritage as a gift to humankind, as common heritage, others feel that there are some sacred elements that should stay within the community. There is also a widespread discontent with commodification of this heritage, especially when outsiders are the ones profiting from it, as this is perceived as a form of biopiracy (cf. Madrazo Lajous 2011). It is crucial to come to a common agreement on how these resources should be governed, as this not only would help to specify rights, but also responsibilities, especially in regard to conservation and sustainable use (Timmermann and Robaey 2016). The current situation where biodiverse rich countries are absorbing the majority of the costs of maintaining and developing their traditional landraces, as well as lost business opportunities caused by halting land use changes, from which ultimately the whole humanity benefits is neither fair nor sustainable. A fairer division of costs is needed since much of this tradition and resources are treated and embraced as common heritage.

### **Building resilient food systems: climatic and social challenges**

It is inevitable that systems we rely upon will be disrupted (Kolers 2016). As food is a basic need, increasing the resilience of food systems becomes an issue of social justice, especially since in a region of extreme inequality price shocks due to scarcity or temporary unavailability will be suffered far more intensively by the poor (Tendall et al. 2015). Two factors make the region particularly vulnerable: extreme weather events and the exponential concentration of people in the major cities.

Historically, the region is prone to natural disasters, as it harbours one of the most active earthquakes regions of the world along the pacific coast and the Antilles, and is hit by weather-related events such as floods, droughts, and in the Caribbean and Northern Pacific coast of the region also hurricanes and tropical cyclones. The likelihood of extreme weather events will increase in the future considerably due to climate change. We have reached a point where human survival already demands to

undertake major climate change adaptation strategies due to the ongoing lack of action made to halt carbon emissions (McMichael 2017).

One of the clearest and latest examples of the need to adapt food production to extreme weather events is the case of hurricane Irma impacting Puerto Rico in September 2017. The hurricane left 3.4 million people without power, water or fresh food. The destruction of coastal infrastructure and large-scale power cuts together with its strong reliance of imported food created a national food emergency. This extreme vulnerability is the result of irresponsible and exploitative public policies that are not apt for an island with natural disasters. It has become clear that these regions need to reclaim food sovereignty (Félix and Holt-Giménez 2017). Regions that have re-designed food production on the basis of agroecological principles and thus reduced their current dependency on imports of food and agricultural inputs, have improved their resilience to extreme weather events and price increases, as studies from Nicaragua (Holt-Giménez 2002) and Cuba (Rosset et al. 2011) show. Biodiverse farms are more resilient to extreme weather events and capture far greater amounts of carbon (Altieri et al. 2015), thus helping to adapt to climate change while contributing to its mitigation (Timmermann and Félix 2015a).

As an issue of justice, we have to keep in mind that the failure to adapt food production to climate change is most strongly paid by the poor, in many cases with hunger. Justice demands that the burdens of climate change be distributed fairly, the current situation where the poor – usually people with a far lower carbon footprint – end up paying the highest price in terms of well-being (or with their lives) is clearly ethically unacceptable (Loewe 2013). The vulnerability climate change amounts to, adds one more argument to redesign food systems in view of increased resilience.

As a region that will have to do massive work to adapt food production to climate change, it is crucial that good relations are maintained to exchange knowledge, data and innovation. Countries of the region will have to work on common agendas so that they exert pressure as a group to avoid absorbing the full cost of this agricultural transition and advocate for mitigation efforts.

Beside the environmental risks factors the region faces, we can increasingly observe a risk factor that comes from another dimension: the social factor. Latin America is home to some of the largest cities in the Western Hemisphere, which makes the population particularly vulnerable to fluctuations in food supply and prices. Massive agglomerations such as Mexico City, Sao Paulo, Buenos Aires and Rio de Janeiro, among many others in the region, bring major challenges for food security and sustainability. These large urban centres absorb with their much larger purchasing power crucial resources needed for food production: water, land, labour, and food needed for land workers (Delgado Ramos 2013).

Agricultural workers, especially those practicing ecological methods, have also an important role as natural resources stewards and providers of ecological services. Agricultural land hosts a number of species, captures carbon and filtrates air. Moreover, rural inhabitants also act as stewards of environmental resources, hindering or slowing down unsustainable exploitation (Rozzi 2012). These ecological services are rarely remunerated, despite the fact that urban populations are dependent on them.

It has become clear that the current urban-rural relationship is neither fair nor sustainable and a new arrangement has to be found. Logistical challenges favour solutions that foresee an increase in food production within cities, in the form of farm towers, allotments and roof farms (Rydin et al. 2012). If properly designed, such urban food production systems could capture carbon, make use of rainwater and some types of waste water, recycle nutrients from food waste, and reduce food miles, making cities both more sustainable and more resilient.

Stimulating urban food production demands also social innovations and here ethics comes in hand. For many urban dwellers growing food is not a cost-effective way of using their labour and sometimes even resources. We need arguments based on ideas of justice to motivate people to do their own share of urban food production as a contribution towards reducing the environmental footprint of the food they consume (Di Paola 2014) and increase the resilience of food systems. As a first justice-based argument to involve in urban agriculture I can list the importance to do one's share in increasing the resilience of urban food systems. The stability of political and economic institutions depends on the maintenance of a civil order. Food insecurity is a major destabilizing factor (Holt-Giménez, Patel, and Shattuck 2010). We thus also draw benefits from stable food supply systems even if we personally are not likely to suffer from food insecurity. In this sense food security is a public good, and like most public goods its establishment requires our individual contributions. Justice thus demands that we do not free-ride and do our part in increasing the systems resilience. The second justice-based argument, appeals to the idea of off-setting our environmental footprint. Urban agriculture is in this sense an attractive offsetting strategy, as it is highly visible and thus may lead to multiple replications.

Lastly, to make a system resilient we need to learn as a society from past mistakes and to identify weak points in the systems we rely upon. Here knowledge sharing and acquisition becomes crucial (Tendall et al. 2015). This demands regional cooperation and the building of local research and development capacities. This requires willingness to cooperate and for this it is fundamental that past injustices be acknowledged and the countries work towards building new types of constructive relations and explore new cooperation opportunities.

## **Epilogue: Horizontal knowledge transfers – a dialogue among peoples living in the same latitudes**

Countries of the Global South have a poor record of exchanging scientific ideas, in particular there is very little scientific exchange between Africa and Latin America (Mazlounian et al. 2013). A scientific dialogue on social, ecological and agronomic issues is strongly needed as the countries of the Global South are facing very similar challenges and opportunities. Climate change will have a far worse effect on food security in the countries within the tropics, creating a strong need to make tropical agriculture more resilient to climate change and extreme weather events (Altieri and Koohafkan 2008). Rapid urbanization is becoming a social and environmental challenge in most countries of the Global South (Rydin et al. 2012). The countries will have to learn how to tackle extreme inequalities and their negative effects on social justice and the environment.

While the region faces a number of similar struggles, it also offers many new opportunities. The population is young and open to new ideas. Many nations have not had previously a substantial knowledge exchange, providing an ideal ground for developing new ideas in cognitively diverse relationships. Ecologically, the Global South offers an enormous potential to explore permacultures, since in large parts of the region the absence of harsh winters allows the cultivation of far more different crops throughout the year. The similarity of many of the challenges the Global South faces allows to pull intellectual and financial resources together to develop common technological and social innovations (Camacho 2008).

The different regions should however not depend on intermediaries for such exchanges. Their own necessities and enthusiasm should be sufficient to come up with common research and cooperation agendas. It is crucial that knowledge developed in these regions is used and expanded, which requires to establish alternative research networks that are better suited to incorporate traditional knowledge and to provide solutions for the challenges of sustainable development and the optimal use of local resources (Olivé 2004, Gupta 2006, Kelbessa 2015).

Such a dialogue may allow to truly incorporate the desire and need of living in harmony with the natural environment in developing agendas, a so-called ecodevelopment that many communities and countries of the Global South strive for (Max-Neef 1992, Gudynas 2011, Leff 2013). Long-term sustainability demands a transformation of food systems to include the conservation and restoration of natural habitats as a central policy goal, by encouraging production methods that seek a symbiotic relationship between nature and people, reduce dependency on externally produced inputs and exploitative social and environmental

arrangements, are resilient to environmental changes and social pressures, and provide adequate food to both rural and urban populations.

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