Family, territory, nation: post-neoliberal agroecological scaling in Nicaragua

NILS McCUNE

Agroecological scaling-up, as the words suggest, is best achieved as a process constructed 'from below'. How then to understand the political dimension of agroecological scaling, if not also as a popular process of democratization of food systems? This article explores the political and social dimensions of the Nicaraguan process of agroecological scaling, using the frame of food sovereignty, or the right of peoples and nations to define, build, and defend their own food system. As part of the ALBA alliance of Latin American countries, Nicaragua's government positions itself to the political left of many of the more neoliberal governments in the region. Post-neoliberalism provides a historical context for the repositioning of the state in regard to peasant and family agriculture, rural education, and social economies. As agroecological knowledge is re-produced, shared and multiplied, agroecological organizational structures become essential to scaling-out and scaling-up processes. We discuss the role of the state in determining the popular diffusion of agroecological methods and thinking across the Nicaraguan countryside.

Keywords: agroecological scaling, food sovereignty, post-neoliberalism, knowledge demands, territorial mediators

AGROECOLOGY IS, IN COLLOQUIAL TERMS, the talk of the town these days (Montenegro, 2015; FAO, 2016; Mpofu, 2016). However, within the growing institutional enthusiasm for agroecological theory and practice a fundamental dispute is emerging, one which reflects the confrontation of two distinct visions of agricultural development: on the one hand, that promoted by conventional monoculture agribusiness interests, while on the other, the vision of diverse social movements made up of organized peasants, indigenous peoples, traditional herders, fisherfolk, and young people entering farming. For example, in its efforts to engage with agroecology since 2013, the United Nation's Food and Agriculture Organization (FAO) has encountered a fierce and vocal resistance among civil society organizations (CSO) such as the global agrarian movement La Via Campesina (LVC) to what these organizations call the 'cooptation' of agroecology by interests tied to corporate development and financial capital (Giraldo and Rosset, 2016). Rather than seeing agroecology as just another 'tool' in the 'toolbox' of conventional, corporate agriculture, social movements see it as the social and productive model destined to replace agribusiness (LVC, 2015; Declaration of Nyéléni, 2015).

The political vision of agroecology as a fundamental break with corporate agriculture is best articulated in the concept of food sovereignty, which can be

Nils McCune (nils_mccune@hotmail.com) is a researcher in the Department of Agriculture and Society at El Colegio De La Frontera Sur (ECOSUR), Chiapas, Mexico.

http://dx.doi.org/10.3362/2046-1887.2016.008, ISSN: 2046-1879 (print) 2046-1887 (online)

briefly defined as the 'right of nations and peoples to control their food systems, including markets, production modes, food cultures and environments' (Wittman, 2010). Proponents of food sovereignty argue that food security, while important for recognizing constitutive elements of hunger, also masks some of the fundamental causes of hunger, such as commoditized food and the liberalized global commerce model. Food security makes no mention of where food comes from or how it is produced (Rosset, 2003). On the other hand, food sovereignty makes explicit the underlying relationships between democracy, culture, economics and the environment, by understanding food as a right, rather than merely another commodity. Additionally, in the world of international law and politics, food sovereignty is one of the first concepts to emerge 'from below', as peasant and indigenous movements introduced the concept in the early 1990s and demanded that it be taken seriously (Wittman, 2010).

According to its proponents, agroecology has important synergies with the food sovereignty paradigm, including its focus on local resources and knowledge, women's participation in food systems, and long-term economic, ecological, and social sustainability. Both agroecology and food sovereignty can be understood as responses to the postwar processes of capitalist globalization, including the commodification of food and increasing control over food systems by transnational corporations (Friedmann and McMichael, 1989; McMichael, 2005; Bernstein, 2010). In the meetings of La Vía Campesina, organizations often declare that 'food sovereignty without agroecology is empty discourse, while agroecology without food sovereignty is just a technical fix' (Martínez and Rosset, 2014).

In this contribution, we explore the connection between agroecology and food sovereignty in Nicaragua, where recent laws passed by the National Assembly (Law 693—The Food and Nutritional Security and Sovereignty Act of 2009, and Law 765—The Foment of Agroecological and Organic Production Act of 2011) have at least in theory opened the door to institutionally scaling up agroecology using the food sovereignty paradigm. This would put Nicaragua in a category of Latin American countries currently being observed by academics seeking to understand the challenges of implementing food sovereignty and scaling out agroecology. We use the concept of post-neoliberalism to describe the somewhat contradictory political nature of Nicaragua's current development model.

In the following section, we provide a brief introduction to the theoretical underpinnings of the food sovereignty–agroecology nexus, as understood by the social movements that have propelled the passage of recent laws and even national constitutions that use food sovereignty language. Next, we look at recent Nicaraguan history and the consolidation of a National Unity and Reconciliation Government by the Sandinista Front and President Daniel Ortega, elected three times since 2006. Specifically, we seek to shed light on the content of the post-neoliberal model adopted by the Sandinista Front and its importance for scaling up agroecology. Then, we present findings on the role of the state, both as an actor in scaling agroecology and as a negotiator in the conflict between social movements and transnational capital. By analysing the politics of agroecological scaling in Nicaragua, we are able to compare the Nicaraguan experience with other countries that make up the

Bolivarian Alliance of the Peoples of Our America (ALBA), a left-leaning coalition that grew out of successful resistance to the Free Trade Agreement of the Americas (FTAA) promoted by the United States' Bush administration in 2005 and 2006. Finally, our conclusions point to the thorny issues that prevent the emergence of 'food sovereignty in one country' and the uncertain future for a conceptual framework that is, in our view, linked to humanity's right to a future.

Agroecology to conform, agroecology to transform

At the International Forum on Agroecology of 2015 in Nyéléni, Mali, organizations of indigenous peoples, peasants, herders, fisherfolk, family farmers, rural workers, and consumers, as well as allies from the NGO and academic sectors, produced a declaration in favour of 'agroecology as transformation' involving redistributive land reform to small producers, defence of the commons, the proliferation of agroecology via horizontal methods such as farmer-to-farmer, and a fundamentally new relationship between the city and the countryside (Declaration of Nyéléni, 2015). Rather than the 'cookie cutter' solutions of the technical packages of conventional, Green Revolution agriculture, agroecology emphasizes place-based, unique solutions to unique problems, involving deep local knowledge (Gliessman, 1998). For social movements, agroecology comes from a vast dialogue among several different ways of understanding the world; rather than Western reductionist logic dominating, it must enter into substantive dialogue with empirical knowledge as well as knowledge embodied in indigenous and peasant productive cultures in the Global South. As such, agroecology as a science is the systematic organization and explanation of indigenous knowledge about agriculture, accumulated during millennia (LVC, 2015).

The contradictions of the corporate-industrial agriculture model have by now become widely known. The global food system, which produces roughly three times the quantity of calories needed by the world's human population, has not come close to resolving the moral dilemma of nearly a billion malnourished people. The corporate agribusiness model is only about 60 years old, but has already threatened global water resources, replaced tens of thousands of seed varieties with several dozen cash crops, diminished soil fertility in every continent, accelerated the exodus of rural communities towards unsustainable megacities, and contributed to the incidence of chronic and infectious diseases that affect much of the world's population (Patel, 2013). Monoculture production tends to consume more energy—in fuel and synthetic inputs—than it produces in calories, even before including the energy budgets of global commodity routes and 'food miles'. When one includes the production and transportation of inputs, as well as field and feedlot processes and the distribution of food commodities, the activities of the corporate food system currently contribute between 44 and 57 per cent of global greenhouse emissions (IAASTD, 2008).

Green Revolution technologies, initially associated with major leaps in the indicators of land-efficiency and especially labour-efficiency of monocultures,

have failed to keep up their pace of productivity increases since the 1970s (Rosset, 2003; Patel, 2013). This fact has combined with highly complex problems of soil degradation, water contamination, rural exodus, increasing farm input costs and, in short, sustainability problems in the for-profit agriculture model built around the technologies of the Green Revolution. As ecological, social and economic problems have accumulated, new political challenges emerged for the conventional agribusiness model, in the form of consumer movements for food safety and against genetically modified crops, global campaigns against seed privatizers like Monsanto, and increased recognition of the association of the conventional model with global environmental change. In response to these pressures, transnational farm input and food industries have implemented measures to 'green' their image and appeal to environmentally conscious consumers. According to the Declaration of Nyéléni (2015), slogans such as 'climate-smart agriculture' or 'sustainable intensification' are essentially false solutions pushed by the same interests who created the problems of monoculture.

Agroecology, then, as a set of practices based on ecological principles and locally available resources, is useful to banking sectors, development organizations, and agrifood companies, to the extent that it can be made into another tool in a portfolio of techniques for making industrial agriculture profitable (Giraldo and Rosset, 2016). The version of agroecology as a complement to existing conventional technologies is rejected patently by social movements who promote agroecology as a way to move away from the abyss of cataclysmic environmental and social crises (Declaration of Nyéléni, 2015). Such conflicting, polarized conceptions of the problems of global agriculture have increasingly become part of the debate in institutional spaces, such as the FAO's 2014 Symposium on Agroecology in Rome and subsequent regional encounters in Brasilia, Dakar, and Bangkok (Giraldo and Rosset, 2016). It is in this global context of increased institutional recognition of agroecology, coupled with highly distinct visions of its meaning, that countries such as Nicaragua begin to enact, or attempt to enact, public policy to promote agroecology.

Post-neoliberalism in Nicaragua and agroecological public policy

The Sandanista revolutionary government, which seized power in 1979 immediately began literacy campaigns such as Fernando Cardenal's world-renowned literacy crusade, which reduced illiteracy to 8 per cent. The agrarian reform process eventually touched 3 million hectares of the country's 5 million hectares of farmland (Núñez-Soto, 2015). Additionally, Nicaragua's health care infrastructure, including the system of public hospitals and clinics, essentially dates back to the revolutionary period of the 1980s.

During the next three presidential periods, the Nicaraguan Government privatized health care and introduced educational 'autonomy', which made each public school responsible for paying teachers' and administrators' salaries, essentially passing the cost of education to parents. By 1996, 34 per cent of the population was considered illiterate, while half a million children and teenagers were outside of the

school system, in a country with a total population of 6 million people (Hanemann, 2006; UNDP, 1998). Nicaragua became the second poorest country of the western hemisphere, after Haiti, as international aid and remittances from Nicaraguan citizens living abroad became the pillars of the economy (Bonino, 2016). The 'lost decade' of the 1990s and early 2000s was not simply an uncontested, top-down process; on the contrary, student movements shut down Managua for several months protesting against budget cuts, and rural workers virtually occupied state farms on the cusp of being privatized, creating cooperatives and a bottom-up process of land reform (Wilson, 2013). After coming in second in three consecutive presidential elections, Daniel Ortega beat all other candidates with 38 per cent of the vote in 2006 and returned to the presidency in 2007 after 17 years.

The incoming Sandinista-led coalition created a National Unity and Reconciliation (NUR) government, with slogans such as 'Christian values, socialist ethics, and actions in solidarity'. Within its development plans, the 'recuperation of rights' plays a major role, guiding diverse policies, including the renewed literacy campaigns, and the reconstruction of public education and public health care, among other key areas (National Human Development Plan of Nicaragua, 2012). Social infrastructure, including roads, parks, farmers' markets, child care centres, and maternity homes in each municipality of the country, has been the hallmark of the NUR government.

One of the first laws related to the food sector to be enacted by the returning Sandinista government was Law 693, the Law of Food and Nutritional Sovereignty and Security of 2009. This law, the goal of several years of social movement articulation and lobbying, declared food sovereignty and security to be the responsibility of the state, to be carried out in collaboration with territorial and social actors (Araujo and Godek, 2014; Godek, 2015). Aside from Law 693, there are several recent laws that contribute to the argument that food sovereignty is a legitimate analytical lens for understanding Nicaraguan food and agricultural social processes. Law 717 mandates the creation of a fund for purchasing land for distribution to women peasants. Law 765, the Law of Foment to Agroecological and Organic Production, establishes norms for agroecological production and the capacity for municipalities to create local ordinances to foment agroecology. New state entities, such as the Ministry of the Family, Community, Cooperative and Associative Economy, have become spaces for promoting small-scale farmers and food producers through fairs, farmers' markets, micro-loans, and training (Núñez-Soto, 2015).

Perhaps more important than each individual step taken since 2007 to promote agroecology is the emerging institutional context, involving the relationships between legal structures, institutional policy and practice, territorial capacity, and participation. In the next section, we review some of the more important shifts in the Nicaraguan context for agroecological scaling, from the perspective of territorial realities, but also with a privileged angle on state-led activities. This is not to look past the vast, diverse, and substantial accumulation of non-state experiences in agroecology, including the *campesino*-to-*campesino* (farmer-to-farmer) programme (PCAC) of the National Union of Farmers and Ranchers (UNAG), started in 1987 (Holt Gimenez, 2006), and more recently the Via Campesina's Agroecological

Corridor (McCune et al., 2016). Similarly, the National Autonomous University of Nicaragua (UNAN), in its Leon campus, has a Department of Agroecology and a long-running programme offering a degree in agroecological engineering, and the National Agrarian University (UNA) has recently started Master's and doctorate programmes in agroecology (McCune et al., 2016). Here, as we are particularly concerned with the political economy of agroecological scaling, we take a special look at the state, due to its potential for broader territorial impacts.

Actions from the state: recovering public policy, negotiating development

From commodity production to solidarity exchanges

Prior to 2007, Nicaragua's experiences with seed banks were generally carried out as projects of foreign non-governmental organizations, where the objective was (and often still is) seed commercialization. These 'private sector' seed banks saw seeds as commodities to be produced profitably by small farmers, either in cooperatives or as individuals. The majority of such projects involved the injection of resources, equipment, financing, and technical assistance to organized groups, to help them commercialize seeds and recover the initial investment, with the assumption that through gaining an income by selling seeds, communities would improve their capacity to purchase food, household goods, and basic services, thus reducing poverty (Fernandez, Mendez and Bacon, 2013).

In most cases, these experiences failed as soon as the projects ended, and faced the notorious problem where financing opportunities were concentrated by one person who used the status of the community group for personal benefit. Rarely did projects put effort into strengthening communities' organizational capacity and committed autochthonous leadership that would be able to work transparently to sustain collective plans and activities without a funded project. Neither did these projects focus on strengthening what peasant farmers had already been doing on their own for centuries: seed exchanges, knowledge exchanges, and experimentation (Guharay, 2012).

Since 2011, the Nicaraguan Institute of Agricultural Technology, INTA, has facilitated an organizational model for the production, conservation, and participatory breeding of heirloom and adapted seeds, through the organization and establishment of Community Seed Banks (CSB). These banks' goal is that the producers in each community have at their disposition quality seeds adapted to local environmental conditions and the productive restrictions imposed by the effects of global climate change (INTA, 2013). The key indicator is that communities save sufficient seeds for the next production cycle, reducing the external seed dependence of communities and, as such, improving their food sovereignty and security. With the shift in strategy, other characteristics have also changed in Nicaragua's seed banks, including a marked increase in the participation of women in seed saving and exchanges (Gonzalez Manchón & Macleod, 2010).

In the CSB model, seed exchanges take place both among producers in a community, and between communities. To achieve this, the chief effort is placed

on strengthening community organization and territorial leadership. In the rural territories of Nicaragua, INTA technicians approach communities that bring together two conditions: limited access to heirloom and adapted seeds, and favourable soil and climate conditions for seed productions. In dialogue with the locally based technicians, communities form collectives and define their collective's name, the seeds they want to grow, possible fields that can be assigned to seed production, and the roles and responsibilities of each person. With the support of their technician, the community prepares organic fertilizers and pest management strategies using local resources such as fresh cow's milk, molasses, manure, tree leaves, and rice husks. They also create strategies and local practices for controlling erosion, such as living fences and mulch. In what is known as Nicaragua's Dry Corridor, communities often put into practice technologies for capturing and storing rain water, first in the collective areas designated for seed production, and later, gradually, in their individual parcels. Each collective must also create an agroecological plan for gradually transitioning their farms using agroecological principles.

CSB processes are carried out with the support of INTA technicians, who facilitate constant exchanges of knowledge among producers in the agroecological transition process. These knowledge exchanges constitute the essential element of this organizational model's success. The CSBs break with the logic of the conventional model of extension, which emphasizes individualism, vertical relationships, market-based pre-packaged solutions, and mechanical thinking—replacing it with a logic that is complex, creative, contextualized, and constructed 'from below'. The neoliberal logic is being replaced by a post-neoliberal, constructivist logic that re-constructs community social relationships on the basis of solidarity and active participation of families and communities in the search for local solutions to local problems related to seed access, and complete social integration of women and youth.

In 2015, there were 380 Community Seed Banks at a national level, although 50 per cent had suffered major seed reserve losses following the two consecutive years of lost first harvest seasons due to drought (INTA, 2015). Among the many challenges that the CSBs face is to consolidate the organizational model and to build deeper trust in relationships based on solidarity, in order to advance not only in the production and supply of seeds, but also in crop diversification, post-harvest handling, processing, infrastructure, tools, equipment, and other areas related to the well-being of families that participate in collectives, such as health care, as well as permanent educational and training opportunities.

Knowledge exchanges in pursuit of unique solutions in unique agroecosystems

Just over 600 Territorial Research and Innovation Farms (TRIFs) dot the Nicaraguan landscape, with a minimum of one such farm per municipality. TRIFs are small and medium productive units chosen by INTA for their representative size and climatic conditions, and for the producer family's history of empirical research, innovation, territorial leadership, and willingness to share knowledge. In these farms, producers carry out their own research using INTA technologies such

as water sequestering lagoons, mesh hoop houses for germinating seeds, and improved heirloom seeds, as well as strictly local 'inventions' such as new organic fertilizer recipes, natural medicines, and improvised irrigation systems. They share their findings with neighbouring families, CSB collectives, technicians, university students, and professors, as well as agricultural cooperatives and non-governmental organizations that schedule exchange visits. Most of the technical trainings in agriculture currently taking place in Nicaragua are being carried out in TRIFs, and host farmers are the major trainers.

TRIF families work in close coordination with INTA technicians to make farm self-assessments and plans for the agroecological transformation of their farms. Agroecological transition plans are generally based on using local resources with a creative, context-specific application of certain INTA technologies. Both farmer family and technician conceive of the farm as a place of local reference and as a learning space for other producers and the community, based on its productive, ecological, social, and economic components. TRIF learning spaces have an overtly horizontal character, as farmer exchanges are based on dialogue, the sharing of experiences, and practical workshops with broad participation. The 'popular' educational processes taking place have generated a great deal of discussion on how to develop peoples' consciousness—including and especially technicians'—through innovation and learning processes centred in TRIFs. Government institutions that attend to the countryside have removed patronizing phrases such as 'technical assistance' and 'beneficiaries' from their methodological documents, replacing them with 'accompaniment' and 'protagonists'.

From conventional rural education to popular education

In 2014, Nicaragua's National Technological Institute (INATEC) created a system of 'Augusto Cesar Sandino' Technical Schools of the Countryside (TSC), oriented to improve technical capacities, abilities, and self-confidence in peasant families (Osejo, 2014). By 2015, the TSCs had just over 70,000 registered participants, of which over half were adults over 30. These free schools are established on farms, at existing schools, in community centres, cooperative halls, and other spaces available for encounters. The schools are part of INATEC's efforts to promote employment, especially self-employment, opportunities in the countryside. The TSC system represents an important step towards de-privatizing knowledge and education in Nicaragua, and a major contribution towards generalizing the agroecological production model in Nicaraguan rural society.

The TSC system responds to the need for more massive education and training in the countryside, but also *by* and *for* the countryside; that is, based on the real needs and articulated from the grassroots community level. In this sense it is comparable to the *Educação do Campo* that has been developed as a result of social movement presence in the Brazilian countryside (Pinhiera-Barbosa, 2015). As opposed to the neoliberal period, when the public school system was being privatized and only 10 per cent of secondary school graduates were able to pass the university entrance exams (even fewer in rural areas), the TSC school system is based upon a non-elitist, contextualized education in the countryside (Núñez-Soto, 2015).

Technical Schools of the Countryside are formed when a community organizes and signs up at least 20 people to take classes. As the community members develop a TSC proposal, they identify the main 'knowledge demands' of the community, for example: 'animal feed during the dry season', 'birth and delivery of calves', or 'avoiding crop disease'. Community leaders—who may be religious leaders, teachers, nurses, or farmers—take the petition to any of the institutions that make up Nicaragua's System of Production, Commercialization, and Consumption, to ask for a TSC teacher, who will be a technician from INTA or INATEC.

The school's learning plan is established in the first meetings between the technician and the community, based on the community's knowledge demands. Learning in the TSC begins with the recognition of the knowledge and experience of peasant families, in order to create a dialogue between these 'popular knowledges' and the theory and practical experience of the technician. The purpose of this popular education approach is to develop an enriched practice and a conscious, planned agroecological transition. The month-long introductory module is always the same: 'Mother Earth', and focuses on topics including water, biodiversity, health, forests, and soil. Basic courses include 'Family Garden', 'Small Animal Care', 'Large Animal Care', and 'Farm Planning', among others. In contrast to conventional agronomic education, all the curriculum of the TSCs is based upon organic agriculture, and includes no references to agrochemical formulas. Basic courses focus on ecological soil management, compost, earthworm production, manure management, erosion control, intercropping, water efficiency and catchment, and disease prevention and diagnosis. Specialized courses include the establishment of veterinary medicine clinics in communities, as well as production of more specific management plans for cacao production, coffee farming, or fruit tree management, among other options.

The TSC system contributes to Nicaragua's recovery of the right to an education. Students without secondary school diplomas are able to gain equivalency though graduating all of the TSC basic modules. In groups in which the students have difficulty reading and writing, the course becomes eminently practice-based, so as not to exclude anyone based on their previous schooling level. This degree of flexibility gives the TSC a widespread relevance to rural populations that have low and very low levels of formal education. Many TSC students go on to become community leaders, and there is a considerable overlap between TSC students and TRIF families. This overlap means that on one hand, TSC students begin to achieve greater social status as they transform their farms, and on the other hand, Territorial Research and Innovation Farm families use the TSC school system to strengthen their mastery of farm techniques and, often, to brush up on their reading skills.

Territorial articulation for agroecological scaling-up

Territorial Research and Innovation Nuclei (TRIN) are made up of leading agroecological farmers, representatives of cooperatives, university researchers, and technicians from institutions of the productive sector in a given territory. In these territorial nuclei, participants analyse local problems involving food production, processing, and consumption, in order to coordinate, plan, implement, and evaluate the use of

research and innovation to find solutions. A central assumption of the territorial nuclei model is that for research to be relevant to local realities, local producers, cooperatives, food processors, and retailers should be present and actively participate in research processes (INTA, 2015). The recognition of the importance of empirical knowledge in rural territories helps scientific research approach the real needs of rural communities. The generation of technologies should be a social process based upon dialogue and recognition of common problems. This avoids cookie-cutter, one-size-fits-all solutions, as well as academic isolation and government bureaucracy. Rather than a question of solving problems based on technological adoption, these territorial nuclei focus on technological generation from the specific territories of Nicaragua, based on local realities. They highlight age-old practices of technological innovation in peasant agriculture, and look to multiply agroecological practices already present in a territory as well as trying out agroecological practices that are working in other territories.

Several territorial nuclei constitute a Regional Agricultural Research and Innovation Council (RARIC), where the needs that have been identified in the territorial nuclei are transformed into a research agenda for INTA. The regional council also takes on the follow-up and evaluation of participatory research projects taking place within its territorial nuclei. Rather than create institutional articulation around specific, funded projects—as was previously the case—the regional councils are permanent spaces that maintain an agenda based on local needs and a long-term vision of territorial development. The articulation of these institutional and territorial spaces is shown in Figure 1.

The integration and articulation of territorial and institutional actors into the Nicaraguan Agricultural Innovation System was a major achievement of 2015 for the Nicaraguan Government. This national system is designed to conform to context-specific knowledge needs at the local, territorial, regional, and national levels, with the participation of public and private actors, universities, farmers, ranchers, and the state, in order to increase agricultural sustainability. At the community level, this increasingly means agroecological transformation of farms,

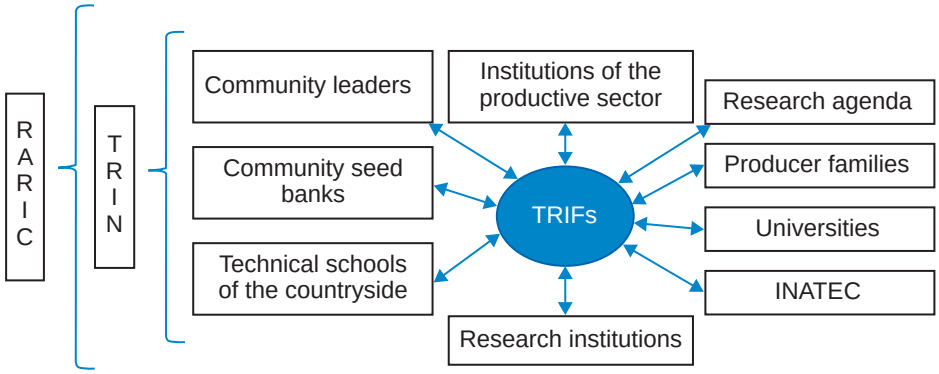

Figure 1 Articulation among territorial and institutional actors for scaling up agroecology in Nicaragua

led by the examples of over 600 territorial innovation farms. The direct participation of 70,000 students—youth and adults—in the technical schools of the countryside, often held in agroecological farms, is clearly pointing in the direction of a multiplier effect in agroecological production. The direct participation of over 4,000 people in 380 community seed banks is another indicator of the massive nature of the agroecological transition taking place.

Conclusions

In as much as Nicaragua has been able to develop a development model that distances the society from neoliberal realities, new synergies are emerging in the collective construction of the countryside. There is a surprising degree of overlap among the visions of rural communities, territorial government institutions, and social movements in promoting agroecological farming as a way to reduce dependence on farm inputs and food imports, conserve agrobiodiversity and maintain food production levels despite the long-running drought that afflicts the country. The number of agroecological farmers in Nicaragua is rapidly growing, as is their social prestige and, importantly, their capacity to innovate and generate solutions from below. Agroecological organizational structures in the rural territories of Nicaragua are also generating secondary benefits, such as massive processes of education, prevention of mosquito-borne epidemics, and greater levels of citizen security. Some historical conjectures are more propitious to scaling-out agroecology than others, and in the case of Nicaragua, post-neoliberal development under the leadership of a National Unity and Reconciliation government is creating a fertile medium for agroecological transition at the national scale.

However, it should be recognized that the substrate of Nicaraguan agroecology is the agrarian structure left by over three decades of revolutionary convulsion and negotiations. The creativity and diversity of state programmes and collaborations that Nicaraguan producers currently enjoy are possible because of the favourable conditions of land access, as well as the memory of major popular victories over conservative sectors such as the national oligarchy, which obliges such sectors to negotiate with the state in order to preserve their privilege. The Nicaraguan state is thus able to dedicate public spending to social needs, and is slowly showing signs of being able to negotiate with certain agribusiness interests, such as is the case with commercial rice producers, who have incremented the national production of rice from 30 per cent of total national consumption in 2008 to 80 per cent in 2015 (Núñez-Soto, 2015).

Much scholarship has been dedicated to discussing the ideological character of Latin America's left-leaning ALBA alliance, which includes Antigua and Barbuda, Bolivia, Cuba, Dominica, Ecuador, Grenada, Nicaragua, Saint Kitts and Nevis, Santa Lucia, Saint Vincent and the Grenadines, and Venezuela. Here, we use the term 'post-neoliberal' to make clear what the progressive alliance is seeking to overcome, as well as the ambiguous nature of what, exactly, it is proposing in place

of the neoliberal model. With a political doctrine that some pundits call 'resource nationalism', governments began to renegotiate hydrocarbon rents and redistribute national budgets to address the grave social consequences of five centuries of colonialism and neocolonialism, as well as the 'lost decade' of neoliberal reforms. Elected leaders of Venezuela, Cuba, and Bolivia have spoken most clearly in favour of '21st Century Socialism', a kind of national self-determination led by worker and neighbourhood cooperatives in collaboration with democratized, participatory state institutions and a regulated private sector (León, 2013). The idea of agroecological farming as a dominant paradigm, with small farmers enjoying access to local markets, spaces for exchanging seeds and knowledge, public sector investment and accompaniment, and, as such, a reality in which all consumers had access to agroecological food, is known in Latin American countries as the *masificación* (roughly translated as 'massive character') of agroecology. Machín et al. (2010) and Rosset et al. (2011) explore this process in Cuba, where the loss of all major trading partners stimulated a unique search for autonomy at a national level, eventually uniting the conditions for a globally unprecedented proliferation of agroecological thought and practice, which penetrated virtually all of the island's municipalities and now guides over half the country's peasant farmers (see also Chan and Freyre, 2012).

Brazilian social movements have taken to calling centre-left governments 'neo-developmentalist', in that they re-assert the role of the state as negotiator in the conflict between capital and labour (Ban, 2012). Bolivia and Ecuador have been the source of rich theoretical constructions on the *Buen Vivir*, a concept of 'living well' that defies the assumption of perpetual growth that underlies capitalism (Santos, 2009). Cuba's recent economic reforms point to a future based on decentralized cooperative and small business production and distribution, while retaining state control over fundamental and strategic assets (Odriozola et al., 2013). Despite the differentiated proposals, the period since ALBA was formed in 2001 has been one of unprecedented Latin American unity, culminating in the founding of the CELAC, or Community of Latin American and Caribbean States, in 2012, which for the first time brings together all Latin American countries without the presence of the United States or Canada.

The food movement, as it is known in several countries of the Global North, connects a basic daily material necessity—eating—with irreconcilable structural contradictions of late-stage global capitalism, and in doing so begins to trace out elements of what could emerge as a social and economic system better suited to a finite planet. The missing link in making progress with agroecology—in time to prevent extraordinary socio-ecological disaster during the 21st century—is the question of scale. The agroecological logic, an appropriation of nature's functioning principles, must be taken to scale and converted into a mass movement in every continent. As a movement and historical process developed from below, agroecological change is manifested through the transitions under way in hundreds of thousands of small and medium farms across the planet.

References

Araujo, S. and Godek, W. (2014) 'Opportunities and challenges for food sovereignty policies in Latin America: the case of Nicaragua', in N.C.S Lambek, P. Claeys, A. Wong and L. Brilmayer (eds.), *Rethinking Food Systems: Structural Challenges, New Strategies and the Law*, pp. 53–74, London: Springer.

Ban, C. (2012) Brazil's liberal neo-developmentalism: new paradigm or edited orthodoxy? *Review of International Political Economy* 20(2): 1–34 <http://dx.doi.org/10.1080/09692290.2012.660183>.

Bernstein, H. (2010) *Class Dynamics of Agrarian Change*, Nova Scotia: Fernwood Publishing.

Bonino, J.C. (2016) *Globalización a la Centroamericana*, Managua: Alcaldía de Managua.

Chan, M.L. and Freyre, E.F. (2012) *Unfinished Puzzle. Cuban Agriculture: The Challenges, Lessons and Opportunities*, Oakland, CA: Food First.

CNE (2016) Tercer Informe de Resultados Electorales, 7 November 2016, Managua: Consejo Nacional Electoral.

Declaration of Nyeleni (2015) *Declaration of the International Forum on Agroecology*, Nyéléni, Mali, 27 February 2015.

FAO (2016) *Agroecology Knowledge Hub*, Rome: Food and Agriculture Organization of the United Nations.

Fernandez, Mendez, and Bacon (2013) 'Seasonal hunger in coffee communities: Integrated analysis of livelihoods, agroecology, and food sovereignty with smallholders of Mexico and Nicaragua, Available at: <https://www.uvm.edu/~agroecol/FernandezEtAl_YaleFoodSovConf42_2013.pdf>

Friedmann, H. and McMichael, P. (1989) 'Agriculture and the state system: the rise and fall of national agricultures, 1870 to the present', *Sociologia Ruralis* 29(2): 93–117.

Giraldo, O. and P. Rosset (2016), La agroecología en una encrucijada: entre la institucionalidad y los movimientos sociales. *Guaju Matinhos* 2(1): 14–37.

Gliessman, S. (1998) *Agroecology: Ecological Processes in Sustainable Agriculture*, Boca Ratón, FL: CRC Press.

Guharay, F. (2012). 'Sistematizacion de experiencias y aprendizajes de campo sobre bancos comunitarios de semilla por organismos nicaraguences aliados en la plataforma zona alta de matagalpa' in Bancos comunitarios de semilla, pp. 46. Available at: <http://simas.org.ni/media/1339431618_Web%20Banco%20semillas%20revista.pdf>

Godek, W. (2015) 'Challenges for food sovereignty policy making: the case of Nicaragua's Law 693', *Third World Quarterly* 36(3): 526–43 <http://dx.doi.org/10.1080/01436597.2015.1005437>.

Gonzalez Manchón, B. and Macleod, M (2010), 'Challenging gender inequality in farmers' organisations in Nicaragua'. Gender and Development 18(3): 373–386.

Hanemann, U. (2006) 'Nicaragua's literacy campaign', paper commissioned for the *EFA Global Monitoring Report 2006, Literacy for Life*, Hamburg: UNESCO Institute for Education.

Holt Giménez, E. (2006) *Campesino a Campesino: Voices from Latin America's Farmer to Farmer Movement for Sustainable Agriculture*, Oakland, CA: Food First Books.

IAASTD (2008) *Agriculture at a Crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), Washington, DC: Island Press.

INTA (2013) *Guía Metodológica: Organización de Bancos Comunitarios de Semillas*, 1st edn, Managua: INTA.

INTA (2015) *Guía del Promotor y la Promotora Rural Agropecuario*, 5th edn, Managua: INTA.

International Renewable Energy Agency (2015) *Nicaragua: Renewables Readiness Assessment. Executive Summary*, Abu Dhabi: IRENA.

León, I. (2013) 'La ALBA como horizonte', in I. León (ed.), *La ALBA: el horizonte latinoamericano del Siglo XXI*, Quito: ALAI.

LVC (2015) *Agroecología campesina por la soberanía alimentaria y la Madre Tierra. Experiencias de La Vía Campesina, Cuaderno 7*. Edición especial para el V Congreso Latinoamericano de Agroecología de SOCLA, October 2015.

McCune, N.M., Rosset, P., Cruz Salazar, T., Morales, H. and Saldivar, A. (2016) 'Mediated territoriality: rural workers and the efforts to scale out agroecology in Nicaragua', *The Journal of Peasant Studies* [online] 10 November 2016: 1–23 <http://dx.doi.org/10.1080/03066150.2016.1233868>.

McMichael, P. (2005) 'Global development and the corporate food regime', in F. Buttel and P. McMichael (eds.), *New Directions in the Sociology of Global Development (Research in Rural Sociology and Development)*, vol. 11, pp. 265–99, Bingley, UK: Emerald Group Publishing Limited.

Machín Sosa, B., Roque Jaime, A.M., Ávila Lozano, D. and Rosset, P. (2010) *Revolución Agroecológica: el Movimiento Campesino a Campesino de la ANAP en Cuba*, La Habana: Asociación Nacional de Agricultores Pequeños y La Vía Campesina.

Martínez, M.E. and Rosset, P. (2014) '*Diálogo de Saberes* in La Vía Campesina: food sovereignty and agroecology', *The Journal of Peasant Studies* 41(6): 979–97 <http://dx.doi.org/10.1080/03066150.2013.872632>.

Montenegro, M. (2015) 'Agroecology can help fix our broken food system: here's how', Ensia 14(1) [online] <https://ensia.com/voices/agroecology-can-help-fix-our-broken-food-system-heres-how/> [accessed 12 December 2016].

Mpofu, E. (2016) 'Agroecology for gender equality', *Farming Matters* 32(3): 23.

National Human Development Plan of Nicaragua (PNDH), (2012), *Plan Nacional de Desarrollo humano Actualizado 2012–2016*. Available at <http://www.pndh.gob.ni/>

Núñez-Soto, O. (2015) *Sandinismo y Socialismo*, Managua: Fondo Cultural Darío y Sandino.

Odriozola, S., Fernández, O. and García, M. (2013) 'La transición socialista y el modelo económico y social', in M. García-Rabelo (ed.), *Modelo económico y social cubano: nociones generales*, Havana: Editorial UH.

Osejo, N. (2014) 'Escuelas de campo para transformar la realidad productiva de Nicaragua' [online], National Agrarian University <www.una.edu.ni/index.php/direcciones/direccion-comunicacion/271-escuelas-de-campo-para-transformar-la-realidad-productiva-de-nicaragua> [accessed 21 February 2016].

Patel, R. (2013) *Stuffed and Starved: From Farm to Fork, the Hidden Battle for the World Food System*, London: Portobello Books.

Pinhiera-Barbosa, L. (2015) *Educación, Resistencia y Movimientos Sociales: la práxis educativo-política de los Sin Tierra y de los Zapatistas*, Mexico City: LIBRUNAM.

Rosset, P. (2003) 'Food sovereignty: global rallying cry of farmer movements', *Food First Backgrounder* 9(4): 1–4.

Rosset, P.M., Sosa, B.M., Roque Jaime, A.M.R. and Ávila Lozano, R.A. (2011) 'The Campesino-to-Campesino agroecology movement of ANAP in Cuba: social process methodology in the construction of sustainable peasant agriculture and food sovereignty', *Journal of Peasant Studies* 38(1): 161–91 <http://dx.doi.org/10.1080/03066150.2010.538584>.

Santos, B. de Souza (2009) *Descolonizar el saber, reinventar el poder*, Montevideo: Ediciones Trilce.

UNDP (1998) *Human Development Report 1998*, New York: UNDP.

Wilson, B. (2013) 'Breaking the chains: coffee, crisis, and farmworker struggle in Nicaragua', *Environment and Planning* 45: 2592–609 <http://dx.doi.org/10.1068/a46262>.

Wittman, H. (2010) 'Reconnecting agriculture and the environment: food sovereignty and the agrarian basis of ecological citizenship', in H. Wittman, A. Desmarais and N. Wiebe (eds.), *Food Sovereignty: Reconnecting Food, Nature and Community*, Oakland, CA: Food First.

World Economic Forum (2015) *The Global Gender Gap Report 2015*, Insight Report, Geneva: WEF.