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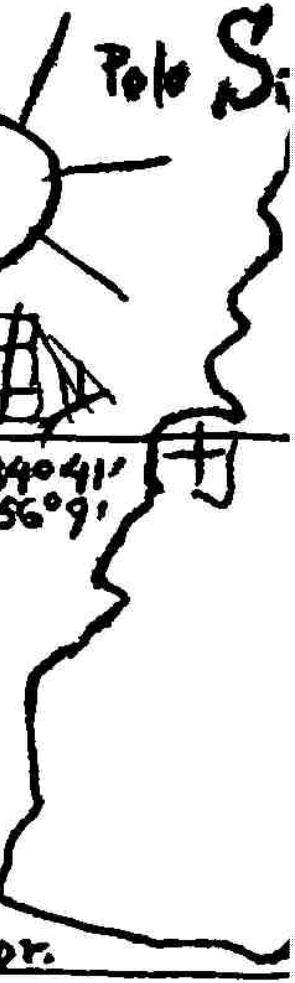

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Introduction to the Special Issue: Agribusiness, (Neo)Extractivism and Food Sovereignty: Latin America at a Crossroads? - *Ana E. Carballo, María Eugenia Giraudo, Diego Silva & Johannes Waldmueller*

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Por una Vida Digna: Science as Technique of Power and Mode of Resistance in Argentina - *Ingrid E. Feeney-Mccandless*

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Alternautas is a peer reviewed academic blog that publishes content related to Latin American Critical Development thinking.

It intends to serve as a platform for testing, circulating, and debating new ideas and reflections on these topics, expanding beyond the geographical, cultural and linguistic boundaries of Latin America - Abya Yala. We hope to contribute to connecting ideas, and to provide a space for intellectual exchange and discussion for a nascent academic community of scholars, devoted to counter-balancing mainstream understandings of development.

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Contents

Introduction to the Special Issue: Agribusiness, (Neo)Extractivism and Food Sovereignty: Latin America at a Crossroads? - *Ana Estefanía Carballo, María Eugenia Giraudo, Diego Silva & Johannes Waldmueller* 4

Reclaiming the Food System: Agroecological Pedagogy and the IALA María Cano - *Jaskiran Kaur Chohan*..... 13

Seed Sovereignty Struggles in an Emberá-Chamí Community in Colombia - *Laura Gutiérrez Escobar*..... 27

Security and Safety in the Glyphosate Debate: A Chemical Cocktail for Discussion – *Diego Silva* 46

Por una Vida Digna: Science as Technique of Power and Mode of Resistance in Argentina - *Ingrid E. Feeney-Mccandless* 60

The imperial rationality within BioTrade: A contribution to the neoextractivist debate - *Jonas Köppel* 76

¿Y si no en Habana? Landless science, peasant struggle, and capitalist development in Colombia - *Alexander Liebman & Henry A. Peller*..... 92

IWRM and the legacies of large-scale agriculture in the Peruvian Amazon - *Giselle Vila Benites* 114

Control, Utility and Formalization at the "Frontier": Contested Discourses on Agriculture in Eastern Colombia - *Alke Jenss* . 128

ANA ESTEFANÍA CARBALLO, MARÍA EUGENIA GIRAUDO, DIEGO SILVA AND JOHANNES WALDMUELLER[1]

Introduction to the Special Issue: Agribusiness, (Neo)Extractivism and Food Sovereignty: Latin America at a Crossroads?[2]

In Latin America's history, the agricultural sector has played a pivotal role for each period's form of economic, social and political development (Bretón Solo de Zaldivar and Martínez Sastre 2017). This is evident from the colonial global division of labour that assigned many Latin American colonies the role of agricultural producers, entrenching some of the most unequal patterns of land distribution in the world (Florescano 1997, Bulmer-Thomas 2003), to the current expansion of the 'Soybean Republic' in the Southern Cone (Turzi 2011) and the constitutional or legal enshrinement of food sovereignty in Venezuela (1999), Ecuador (2008) and Bolivia (2009) (Altieri and Toledo 2011; McKay, Nehring, and Walsh-Dilley 2014). The role of the agricultural sector in the definition of the region's developmental path - in collaboration with or rejection of either neoliberalism or the so-called postneoliberal state, respectively - cannot be underestimated.

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[2] The introduction to this special issue was originally published in http://www.alternautas.net/blog/2017/8/17/introduction-to-the-special-issue-agribusiness-neoextractivism-and-food-sovereignty-latin-america-at-a-crossroads on August 17th, 2017.

In the past few decades, there has been increasing tension between large scale agricultural producers and international agribusiness holdings, on the one hand, and local peasant and rural organisations, on the other. Tensions have led to what Maristella Svampa (2013) has characterised as an "eco-territorial turn" in social and peasant (including indigenous) struggles. This has partly been analysed within the "ethnic turn" in social studies and "new rurality" literature, focusing on local-international intersections of food and agrarian politics. While indigenous, Afro-American and gender studies have gained traction, the number of regional and international publications with an explicit focus on peasant studies as well as those calling for the redistribution of (and access to) land have effectively diminished since the 1980s (Bretón Solo de Zaldivar and Martínez Sastre 2017).

Despite these trends, the study of the 'everyday' of agricultural policy-making, production, commercialisation and consumption have recently garnered attention in Latin America, as a result of the rapid industrial agricultural expansion, and the consequent resistance by local communities that have attempted to reclaim their agricultural sovereignty. More than ever, the fields of Latin America have become conceptual and direct *battle*fields, where ideological, economic, political and cultural positions clash. The expansion of the agroindustrial frontier, fuelled by technological advances in genetically modified crops and the large-scale use of pesticides and fertilisers, is one aspect of the intensification of extractivist activities that have dominated the region's recent political economic model, further increasing tensions surrounding environmental issues and land use (e.g. Gudynas 2013, North and Grinspun 2016, Svampa and Viale 2014, Svampa 2015). Counterbalancing the advances of industrial agriculture, some rural communities and environmentalist groups have sought to promote and strengthen alternative agricultural models through practices as diverse as polycropping, seed saving, agroecology schools and judicial resistance.

This special issue remains to some extent inscribed in this recent tradition, reflecting the increasing importance of these topics in disciplines such as human geography, anthropology, gender/women studies, etc. It is the intricacy of these

issues, across both topographic, epistemological, semantic and political scales, which calls for pan-regional discussions aimed at unearthing the mechanisms underlying these transformations. This special issue stands at this juncture. The papers in this special issue explore some of the tensions, changes and conflicts arising from the expansion of agribusiness as the dominant mode of accumulation and food production in the region. This issue presents evidence – based on original research – on the multiplicity of mechanisms through which agribusiness has transformed the social, political, economic and environmental landscape of the region. Not only do these contributions cover a wide range of topics that demonstrate the extent the agribusiness mode of production's advancement – including educational programmes, the role of science and international initiatives, and seed sovereignty struggles – but the diverse disciplinary backgrounds and methodological approaches of the authors also offers a very rich analytical focus.

We open this special issue with an article by Jaskiran Kaur that introduces the agricultural struggles tackled by other articles in the issue, as it offers a conceptualisation of the different production regimes that oppose each other through these struggles. The following articles will be published every two weeks until the end of 2017. In her article, Jaskiran compares the main characteristics of two opposing agricultural regimes. The first regime includes industrial agriculture based on monocropping, high yielding plant varieties, and the use of agrichemical products. The second regime is characterized by agroecological alternatives that encourage polycropping and that are based on a more ecosystemic approach. Jaskiran provides an interesting demonstration of the increasing importance of agroecology schools in Latin America through the case of the IALA María Cano agroecology school in Colombia. This school emerged in a historically decisive context for Colombian agriculture. The end of the conflict with the FARC has created the possibility of rethinking the rural world. As a consequence, diverse groups are organising to make this world more suitable to their epistemologies and interests. In particular, they are working towards educating a new generation of rural inhabitants to be more critical of industrial agriculture. In this sense, agroecology schools represent not only an alternative to the dominant agricultural

model that follows the framework of the Green Revolution, but also an epistemological challenge that takes into consideration local ecosystems and knowledges.

The second article enters into dialogue with the first by providing an account of the seed conflicts that arise when the agroindustrial and the agroecological regimes clash. **Laura Gutierrez**' article takes us to Riosucio, in the North West of Colombia, where the Embera-Chami indigenous people of the region have organised to promote and protect their agricultural sovereignty. Laura examines the intricacies of the seed conflicts that take place in this country, where the government and industrial agriculture associations have promoted the use of certified seeds, while Embera-Chami communities have challenged this system through the development of their own networks of seed saving, multiplication, and reproduction. These conflicts constitute struggles over seed sovereignty, that is, over the way seeds are produced, owned, circulated, saved, and endowed with meanings and spirituality. However, these struggles reveal a larger battle over autonomy and place-based ways of inhabiting and sustaining territory. These conflicts are the manifestation of the coloniality of power that continues to promote Euro-American models and knowledges as superior, and Latin American agricultural and botanical knowledges as inferior. The seed, as a living organism that interacts with humans, and as a recipient of cultural, symbolic, and economic values, is at the core of the struggle between colonialism and local resistance, and thus serves as a lens through which these conflicts can be analysed.

These issues are also evident in Argentina, where the expansion of the production of soybeans has been the cornerstone of the country's agribusiness model (Turzi, 2011). The paper by **Ingrid Feeney**, offers an ethnographic account of the severe consequences that have accompanied the expansion of this model. Two decades after the approval of the use of GMO seeds in Argentina, the devastating consequences of the use of agro-chemicals linked to genetically modified seeds are becoming painfully clear. Rural populations are increasingly becoming aware of the dreadful environmental and health impacts of the use of the 'technological package'

that has fuelled the expansion of Argentina's agribusiness. Importantly, Ingrid provides an insight into how this growing awareness has become translated into greater community organisation across the country, with the aim of not only questioning the implementation of the current agribusiness model, but also the different ways in which these practices are legitimised. Her analysis of the movement for a *Ciencia Digna* ('a dignified science') demonstrates the epistemological battles that are fought in the everyday resistance organised by these communities.

In dialogue with Feeney's article, **Diego Silva**´s article focuses on the Colombian debate on the use of glyphosate, the world's most widely used herbicide. On 20 March 2015, the WHO's International Agency for Research on Cancer (IARC) released a controversial report stating that glyphosate is likely carcinogenic for humans. While the discussion in Europe around this report has revolved around the agricultural use of glyphosate to protect the health of citizens, in Colombia the debate has been about the herbicide's use for the destruction of illegal crops to damage the finances of insurgent groups. The article analyses the arguments of the Colombian State functionaries that justify suspending glyphosate fumigations against illegal crops in the context of the Habana peace agreements, while allowing the private use of the product for agricultural uses. In this way, the article considers the links between issues of safety (the protection of humans and the environment from herbicides) and security (the protection of the national population from groups labelled as enemies of society), based on different understandings of the "bodies" under protection (the human body, the political body, the social body).

The role of science and developmental programmes supported international organisations is also addressed by **Jonas Köppel's** article, through the analysis of the implementation of the UNCTAD initiative, BioTrade, in the Peruvian Amazon. By studying the promotion of production of Sacha Inchi, an indigenous peanut variety, Jonas unpacks how a seemingly positive programme that promotes biodiversity and sustainable development can be underpinned by, and further enhance, a neo-extractivist agenda. The BioTrade initiative, which aims to ensure

biodiversity by promoting trade of protected goods, smallholders in the lowlands of San Martin were increasingly discouraged from planting coca and corn and pushed towards the cultivation of Sacha Inchi. However, the increasing production of the product without a developed demand for it quickly saturated the market, driving many farmers into bankruptcy. The author concludes from this analysis that neo-extractivism must be understood as linked to colonial relationships of power and rules that are reproduced through initiatives such as BioTrade. Smallholder farmers are thus pushed into the 'neoliberal rationality' of entrepreneurial and 'modernising' activities supported by international organisations, which, as Jonas points out, reproduce centuries-old colonial power structures.

The contribution by **Alexander Liebman** and **Henry Anton Peller** grapples with historically unequal land distribution and political economy in Colombia. By drawing on the case of the International Centre for Tropical Agriculture (CIAT), established in the 1970s with World Bank's support, the authors retrace how initially well-intended research in aid of smallholder peasants bypassed the question of access to land and therefore contributed to cementing the unequal distribution still present today. In addition, their paper addresses the active epistemological role of economistic and technical science in this process, which seeks to promote capitalist development over other forms of conviviality and production, precisely by continuously 'black boxing' the question of land reform, which is of great importance. Overall, this discussion leads the authors to formulate highly relevant questions with regards to, for instance, research on genetic materials and the supposed homogeneity of concerned researchers. One of the main questions raised in this article is related to the possibility of transforming agronomic research into a "science for the people".

Gisselle Vila Benites brings to our attention the ways in which the advancement of the agribusiness production model affects institutional settings and access to natural resources, such as water. By understanding the application of water management policies in Bajo Naranjillo in the Peruvian Amazon as a case of 'institutional bricolage', Gisselle explores the mechanisms through which the

principles of agribusiness efficiency and capital intensive production are imposed by the state upon local populations. Irrigation being a key aspect of agricultural production, this article shows us the extent to which the consolidation of this model has transformed institutions, local rules and the capacity of indigenous populations to control natural resources.

The paper by **Alke Jenss** explores the deep transformation of the Altillanura region in Colombia, where the expansion of the agricultural frontier has brought to light the dynamics of the 'economies of dispossession and land appropriation' (Jenss, 2017, this issue) that underpin the extractive model dominating Colombian development. Alke offers an overview of the principal mechanisms through which these dynamics are expressed, particularly the expansion of new 'Economic Zones' of production and the growth of large-scale plantations which are institutionalised through the pervasive development plans and legislation. The tensions around traditional forms of land tenure and the necessity to offer 'clear' property rights to encourage investments in the Altillanura region clearly demonstrate the key tensions in the region, where small farmers and indigenous communities' clash with large transnational corporations over the expansion of the agricultural frontier.

While these articles address different issues, they provide an insightful overview of the complexity the agribusiness mode of production and its implications for Latin America. From the development of genetically modified seeds and agro-chemicals, to spaces of production and the expansion of the agricultural frontier, to trade patterns and the use of natural resources, these contributions highlight the increasingly transnational and capital-intensive nature of agriculture, and the environmental, social, economic, and political impact it creates on nature and the lives of people across the region. The incredibly rich empirical research presented here should also remind us that more and more areas and populations are being subjected to this capitalist agricultural model. The struggles addressed in this issue, then, remain at the forefront of the opposition to the intensification of extractivist agriculture as the key pillar of Latin America's future.

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JASKIRAN KAUR CHOHAN[1]

Reclaiming the Food System: Agroecological Pedagogy and the IALA María Cano[2]

Industrial agriculture has been one of the key contributors to global warming and consequent climate disasters worldwide. In 2014, 44-57% of global greenhouse gas emissions were produced by industrial food production; principally from deforestation, transportation of products, their processing and refrigeration (GRAIN, 2014). Numerous food system scholars, including Gliessman, have highlighted the multifaceted nature of this problem, which requires nothing short of a systemic overhaul and a conversion towards territorially rooted, agroecological farming. Among many other characteristics, this involves the use of inter-cropping, organic inputs, small-scale farming that looks to boost and support biodiversity and conserve natural resources.

This paper will focus on the case of the Instituto Agroecologico Latinoamericano (IALA) María Cano in Colombia, which aims to use knowledge as resistance in an epistemo-political struggle against industrialised agriculture. The IALA model is a Pan-Latin American project, promoted by the transnational peasant organization La Vía Campesina (LVC), to attain Food Sovereignty through agroecology. The aim of the school and others like it is to unite knowledge production, with practice,

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community engagement and political formation, to preserve subaltern ways of knowing and doing agriculture. The essay will theoretically outline the phenomenon of industrial agriculture, the impact this has on societies and ecologies, as well as the overarching epistemologies that maintain this. It will then move on to review agroecology as a possible corrective to the expansion of this model of production and accumulation, as well as a healer of its consequent knowledge rifts (McMichael & Schneider, 2010)- defined as the removal of context specific knowledge of local ecologies and realities.

Given agroecology has strong historical roots in Latin America, it is fitting to analyse the epistemological backlash against industrial agriculture in the continent. Colombia has been chosen because recent peace accords between the government and the continent's oldest existing guerrilla group- Fuerzas Armadas Revolucionarias de Colombia- Ejercito del Pueblo (FARC-EP)- have led to a public reappraisal of the rural world. In this context of opening dialogue across social sectors, agroecological farming methods and systems are being underlined by campesino unions and social groups as a key tool to readdress deep rural inequality, as well as restore social, cultural, economic and ecological justice to long marginalised communities. Epistemological resistance against this agro-industrial dominance is highlighted through the IALA María Cano. In the aims and demography it represents, the IALA is part of wider peace accord implementation efforts and could prove to be a crucial way to reform rural education (FENSUAGRO, 2016).

Industrial Agriculture and the Corporate Food Regime: A New Green Revolution

The food regime approach is one way of understanding the structure of global food relations, pre-industrial and industrial regimes of accumulation within the food system, and the multiple effects these had through time. Food regime theory emerged during the period of 'declining national regulation and rising globalisation'

(ibid), a global process that continues to grow. McMichael and Friedmann originally established two food regimes that explained the global movement of food: 1870-1914, a period of British dominance; and 1945-1973, US dominance in the post-war period. The first saw food transported from the colonies to feed industrialising European cities; whilst the second saw a reversal, transporting from the Global North to South through food aid programmes. The second regime took place in the context of the Green Revolution. The technological and scientific implications of the Green Revolution include: the intensification of agriculture, primarily through the application of chemical fertilisers and pesticides, crop cultivation through monocrops and aggressive soil tillage. Through these practices global agricultural yields soared but at significant ecological and social costs (Gliessman, 2015). Additionally, many campesinos found themselves pushed off their lands due to soaring expenses, evidencing what Harvey calls accumulation by dispossession (2004; Hall, 2013; Grajales, 2013). Small landholdings became economically nonsensical, as monocropping required extensive landholdings. Finally, after some theoretical discrepancies (Friedmann, 2005; Campbell, 2009; Bernstein, 2015), McMichael established the third food regime- the Corporate Food Regime (CFR), which began in the late 1980s to present day.

As Gliessman notes, in the CFR 'profit making is an imperative, overshadowing everything else, including maintaining the long-term health of the soils, providing wholesome food, and treating farm labourers fairly' (2015, p.309). It is further defined as an 'era governed increasingly by financializing and neoliberal advocacy of market rule' (McMichael, 2013, p.41). Given the broad nature of the food system, which encompasses technology, knowledge production, politics, markets, societies, culture and importantly ecology, the definition of the CFR is equally expansive. In synthesis, the CFR embodies the corporate takeover of all elements and levels of the food chain, from seed to final packaged product. The main effects of this system include: 1) the accelerated dispossession of smallholders by fostering dependence on agricultural inputs, e.g. seeds and chemicals, as well as through the use of other economic and political tools for territorial dispossession 2) a loss of knowledge or 'knowledge rift' (McMichael & Schneider, 2010), since people are 'alienated from

the different stages of food production and preparation' (Timmerman & Felix, 2015, p.525) 3) ecological costs: increased deforestation, depleted soil fertility, reduced biodiversity and higher levels of CO2 emissions 4) nutritionally poorer diets, consisting of emptier calories and 5) increased importing of primary foods, due to greater exporting of natural resources, foods for animal feed or biofuels. As Gliessman posits, the 'processing, shipping and marketing side of [the] food system means farmers are left with very little money and the need to 'get big or get out' (2015, p.318).

The CFR or industrial food system is supported by a prevailing set of epistemologies. McMichael notes that this current food regime is composed of elements of the previous regimes (2013), a key aspect of which is the Green Revolution. The modern face of this- the 'doubly green revolution' (Conway, 1997) or 'new green revolution' (Holt-Gímenez & Altieri, 2012)- in its foundations is the Green Revolution but also encompasses the use of genetically modified (GM) technology. This is the fastest growing technology in the history of agriculture (Gliessman, 2015). Hybrid or GM altered seeds require high chemical inputs, deepening the green revolution and links to agribusinesses, which hold property rights to seeds and in turn produce the chemical inputs needed to make them grow. To add to the long list of ecological costs of this form of agriculture, GM production is leading to a shortening gene pool in both crops and animal protein, reducing biodiversity and hence natural resilience (ibid).

Agroecology & Food Sovereignty: Food from Somewhere

Inherent to each food regime are a series of conflicting interests and movements looking to change the existing regime of accumulation and or overthrow it. Counterpoised to the CFR and industrial agriculture is the equally diverse and global Food Sovereignty (FS) movement. FS is the right of small producers to cultivate socially and culturally appropriate food, using agroecologically sound methods. Agroecology encourages multi-crop farming, the use of endogenous or

local farming practices, low input but moreover no chemical input farming, it considers ecosystem processes, working in harmony with this to boost biodiversity and soil fertility (Holt-Giménez & Altieri, 2012; Gliessman, 2015; Rosset et al, 2016; Wittman, 2009; Woodgate, 2015). Agroecological farms are rooted in local realities and territorialities, with campesino agency at the heart of planning and execution. This idea is supported by LVC, hence, has strong roots in the global peasant movement. LVC itself identifies the key conflict within the CFR as that 'between centralised, corporate-driven, export-oriented, industrial agriculture versus decentralized, peasant- and family farm- based sustainable production, primarily oriented towards domestic markets' (in McMichael, 2013, p.58). In short, food from nowhere vs. food from somewhere.

As mentioned, agroecology provides the toolkit and methodology to realise FS. This is 'transdisciplinary, participatory, and change-oriented research and action, agroecology links together science, practice, and movements focused on social change' (Gliessman, 2015). An explicit methodological tool that supports this is LVC's *Dialogo de Saberes*, a Freirean exchange of knowledge from campesino to campesino (Martínez-Torres & Rosset, 2014). This 'is based on a horizontal dialogue between peers who have different knowledges and cosmovisions' (ibid., p.4). In this sense, the link between agroecology as a science and as a form of political and social mobilisation within the food system is intrinsic. Horizontality is central to the way agroecology is practised, taught and introduced. If the practice is imposed and didactic, instead of endogenous and participative, it contradicts the democratising potential that this social-economic and ecological approach has, instead, converting into another form epistemological imperialism.

In fact, there is an increasing tendency towards co-opting agroecology as a term and idea. As Loris points out, the diversity in its aims and definitions have opened it up to being divorced from its 'transformative' roots (2017). When the political and social aspects are removed, agroecology is reduced to a science and practice alone, becoming synonymous with organic farming. However, it should be distinguished from this, since agroecology 'emphasises a whole-system approach with minimal

external inputs' (ibid., p.4). Furthermore, organic farming still necessitates external inputs, such as organic fertilisers, it does not insist on multi-cropping, 'and may not necessarily prioritise other holistic principles like water conservation or use of renewable energy' (ibid). As Gliessman asserts, agroecology must 'challenge the ideological system that protects the corporate food regime and it must take issue with the concentration of power and the unequal distribution of wealth that lie at the heart of the way the food system operates' (2015, p.310). As a methodology and practice, it cannot do this unless it firmly links the political, social, cultural, economic and ecological.

Resistive Epistemologies: The Iala María Cano

As has been argued, many campesino communities view agroecology as the active recuperation, documentation, exchange, sharing, dissemination, teaching and use of knowledge (LVC, 2015). In this sense, knowledge itself becomes an act of resistance against prevailing epistemological systems. The IALAs across the continent are infused with this approach and notion. These universities represent an attempt to push against co-optation of the agroecological approach, reinforcing its political, economic, cultural and social foundations. The IALA initiative was preceded by more informal education organised by many umbrella organisations within LVC: through workshops, meetings, courses and seminars (ibid). In total, there have been more than 40 agroecology schools set up around the world, from 'informal farming training centres to more formal universities' (McCune et al, 2014, p.32). The formal schools that have already been established include: The Latin American School of Agroecology (ELAA) located in Paraná, Brazil; the IALA – Paulo Freire in Barinas, Venezuela; the IALA – Guaraní in Paraguay; the IALA – Amazónico in Pará, Brazil; the IALA-Mesoamerica in Managua, Nicaragua; the IALA- María Cano in Viotá, Colombia; the Universidad Campesina "SURI" (UNICAMP SURI) in Argentina; the National School of Agroecology of Ecuador (ENA); as well as new proposals for an IALA in Haiti.

The IALA Mario Cano is the newest of these schools, established on 25th April 2016. It is named after a leading female political figure, who campaigned for the rights of workers in 1920s Colombia. The school was founded by the country's largest agricultural workers' trade union- Federación Nacional Sindical Unitaria Agropecuaria (FENSUAGRO), alongside LVC's Latin American conglomerate- Coordinadora Latinoamericana de Organizaciones del Campo (CLOC-LVC). It was set up in the context of Colombia's historic civil war, which has its roots in the campesino struggle for land and rights to produce. The big difference between many of the IALAs around the continent and María Cano is precisely the history of conflict and the diverse national impacts this has had on the nation's agricultural processes.

The IALA is located on the Raul Valbuena farm, which belongs to FENSUAGRO and consists of 16 hectares (ha). The farm houses up to 80 people, has a communal eating area, kitchen, bathrooms, two classrooms and a computer room (ibid., p.2). The productive area consists of 4 ha of coffee plantation, 11 ha of pasture (with 19 cows) and 1 ha for vegetable cultivation (ibid). All costs for teachers, students' living expenses and matriculation are covered by FENSUAGRO, with the help of international organisations. These organisations include: Solidarity con Latino America, Why Hunger, Agroecology Fund and International Development Exchange (IDEX) from the USA, as well as Isvara from the Basque Country, Spain; further funding is also being sought from the European Union. Additionally, local organisations, from which the students arrive, are expected to cover the costs of journeys to and from the IALA. This has proved problematic, however, as some organisations have been unable to cover these costs. Evidently, the complex financing of the school is only possible through the cooperation and contribution of international and national groups.

Students are selected from around the country to reflect the different geographic experiences of the various communities around Colombia: from the Caribbean, the country's central region, pacific coast and the Amazon. The departments that are represented include: the Guajira, Magdalena, Cordoba, Santander, Boyacá, Tolima,

Risaralda, Cundinamarca, Huila, Valle del Cauca, Nariño, Meta, Putumayo and Caquetá. Within these departments pupils are selected from high conflict areas. In fact, due to the country's civil war and consequent social underdevelopment, many arrive without having finished secondary education, in which case special courses are needed to bring up basic educational levels. This makes the job of educators in this IALA particularly challenging.

Although the rural conflict in Colombia has mutated over the years, not least due to the intervention of paramilitary groups and the narcotics trade, campesinos continue to face huge dispossession of their land. Colombia is one of the most unequal countries in terms of land ownership, with 1.5% of land owners owning some 52.2% of all land in the country, whilst 78.31% of landowners own but 10.59% (Mejía Alfonso & Castañeda in (Ed.) Jairo Alvarez et al., 2013, p.199). The IALA María Cano has been established at this juncture, responding to a historic need for greater land distribution and justice for campesinos. It is also replying to debates around rural reform in the peace accords- specifically clause 1.3.2.2. on rural education (Peace Accords, 2016). This asserts the need for a rural education system that strengthens and promotes 'la investigación, la innovación y el desarrollo científico y tecnológico para el sector agropecuario, en áreas como agroecología, biotecnología y suelos' (ibid., p.27).

Additionally, those in charge of the IALA intend for it to strengthen campesino knowledge, agency and political formation with a 'nueva ética' (FENSUAGRO, 2016, p.1). The new ethic is a political concept, which seeks to insert horizontal, democratic and politically formative characteristics within the school. This is evident in the staff, who are not only knowledgeable in areas related to agriculture but also politically active members of various organisations. For instance, teachers are from the IALA Paulo Freire in Venezuela, the executive branches of FENSUAGRO and from LVC. The IALA's staff is also cross-continental, consisting of Colombians, Venezuelans, Mexicans and Chileans, allowing shared Latin American agricultural experiences. This links with the aims and practices of CLOC-LVC. The fluidity between education and political formation is further

reinforced through student and teacher interaction. Each week representatives from the student body meet with teachers, presently 4 students and 2 staff, evaluating difficulties faced by students, opinions about teaching styles and staff-student engagement. Hence, organisation amongst students is encouraged, as well as collective bargaining and representation. In this way, pedagogy and political practice are intertwined, underlining the way students should engage with agroecology- not only as a science but also as a tool for socio-political empowerment.

This alternative pedagogical approach also informs the intellectual and educational orientation of the school. Students have classes ranging from an introduction to agroecology, mathematics, chemistry, biochemistry, energy and alternative irrigation systems, soil properties, introduction to rural sociology, social-economy, nutrition, research methods; to more politically oriented classes studying campesino organisation, historic rural struggles in Latin America and Colombia, as well as classes on campesino and youth identity (FENSUAGRO, 2017). This curriculum evidences a more socially, economically and politically oriented understanding of agroecology. In this sense, it is clear to see how a solely scientific approach to agriculture is being epistemologically resisted in the IALA.

There has also been an effort to professionalise the agroecology programme taught at the IALA, as well as linking this with other institutions practising this approach. Currently, the course is linked to an undergraduate degree in Agroecological Engineering, conducted at the Universidad de la Amazonia, which also provides some academic resources. In fact, upon finishing the two-and-a-half-year programme at the IALA, students can convert their certificate as an Agroecological Technician to an Agroecological Engineer by studying a further two-and-a-half-years at the Universidad de la Amazonia, thus, completing the undergraduate programme. Links with the few other Colombian universities that also have agroecology programmes are limited for various reasons, including, philosophical and academic differences e.g. University of Antioquia is more research oriented. Interaction with other social movements involved in different aspects of

agroecology are also beginning. For instance, the Red de Semillas visited the IALA in April 2017 and conducted a workshop with students about the importance of native seeds. Other groups that have also collaborated are Sociedad Científica Latinoamericana de Agroecología (SOCLA) and Movimiento Agroecológico de América Latina y el Caribe (MAELA). In this sense, the IALA María Cano links diverse responses to agroecology, education and socio-political resistance movements, aiming to use a different pedagogical style to create structural changes in the Colombian food system.

Another key pedagogical objective of the IALA is to mix agroecological theory and practice (ibid). Students are schooled in the classroom for 3 months, which entails practical work on the IALA's farm and weekly visits to neighbouring farms. In so doing, they learn from the experiences of other IALA's on the continent, which did not engage actively enough with farms and communities in their immediate locale (McCune et al., 2014). Differently, the students of the IALA María Cano interact more directly with their neighbours in Viotá to foment agroecological practices in the immediate area too. These weekly visits are structured by the farm owners. Participants are usually linked to FENSUAGRO, it's sister organisations but also others who have no political affiliation, yet are interested in the programme. There are loose criteria for those who participate. The farm should be successfully producing or have effectively combined conventional and agroecological productive methods. Thus, students learn productive techniques from campesinos, as well as share new knowledge of how to transition towards a more agroecologically friendly farming system. This visit has multiple functions. Firstly, it demystifies FENSUAGRO's work, as well as engendering campesino to campesino dialogue in the community. Although teachers and students do not come from the community itself, a new form of imperialism is avoided through dialogue and interaction with locals. Key organisers of the school confirm that the community is receptive to their work and to agroecology itself, with many opting to reduce their chemical input use. For the following 3 months, students are then sent back to their communities to implement and adapt what they have learnt. In this way, links between the students and their communities of origin are not broken and the knowledge gained

is spread through *campesino a campesino* pedagogy around the country.

The school has confronted several obstacles though. The original objective of the school was to enrol 60 students (FENSUAGRO, 2016, p.1), however, this has been revised. The first intake remained at 25: eight women and 17 men; and the second another 24 students: 14 men and ten women- all between the ages of 18-30. This is due to funding shortages, since resources do not permit the school to accept all students at one single point. The school exists within a global and national context that has financially fed agroindustrial farming. The result of this has been the underfunding of alternative epistemological approaches, such as agroecology. Even though the peace accords clearly state a need to promote this scientific and technological approach, the IALA has so far been excluded from the money designated for post-conflict projects, as this money is largely destined for demobilisation and reintegration projects for ex-guerrilla fighters. It remains to be seen whether it will benefit from more financial support in time. However, doubts remain, since the IALA endorses a very politicised notion of agroecology and campesino led social organising, which does not chime with the understanding of agroecology displayed in the peace accords themselves.

Other key challenges that have been identified are gender (Park et al., 2015) and ethnic divides that deeply effect the rural context. Although gender parity improved in the second intake of students, the majority are nevertheless men. This is despite efforts on behalf of FENSUAGRO to push for gender parity among the student body. For the first intake particularly, regional campesino organisations stated cultural reasons and reluctance from families in allowing their daughters to be educated or sent far from home. It is unclear how far local organisations themselves are affected by these cultural gender divides and whether they could also do more to promote shifts in attitudes and gender politics. Additionally, of the current student body there are 3 students of Afro-Colombian descent and 5 are campesinos of indigenous origin. This mirrors the problematic ethnic divides that weaken possible unity among rural communities in Colombia. In this sense, the IALA could contribute to bridging understanding between these diverse cosmovisions.

FENSUAGRO as the main interlocutor with rural organisations and areas must urgently find new and more creative ways to intertwine gender discourse and a multi-ethnic world views with education. Overturning these divides in the rural world is a key aspect of epistemological resistance to the CFR, since gender and ethnic relations shape access to land, productive and reproductive roles (ibid., p.589).

Conclusion

The CFR and the New Green Revolution have a strong global influence: in the spread of agricultural methods, the wealth that agribusinesses have accumulated, the epistemological dominance that has been garnered through investment in research and development programmes and links with key governmental agencies. In fact, despite the socio-economic and ecological effects that the CFR has upon communities, many small-scale farmers continue to practise industrialised agricultural methods, using agrochemicals, monocrop cultivation or sowing export crops, since fundamentally this allows them to feed their families. As well as epistemological dominance, market forces, the lack of support for agroecological alternatives and poor technical support are but some reasons that explain the limited manoeuvrability that many small-scale farmers fear and face. It is in this context that agroecology, a territorially developed and political other must struggle. The odds are difficult but ecological conditions in the world make an agricultural shift imperative and pressing. Initiatives such as the IALAs in Latin America, provide key methodological and strategic guidance in how the knowledge rifts generated by the CFR can be healed and how effective pedagogy of campesino youth can lead to stronger social organisations, which are better equipped to reclaim the food system, and consequently their political, social, cultural, economic and ecological rights.

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LAURA GUTIÉRREZ ESCOBAR [1]

Seed Sovereignty Struggles in an Emberá-Chamí Community in Colombia [2]

For each seed seized, we will make them germinate and flower again, multiply, spread, and travel freely with farmers across Colombian fields (Network of Free Seeds, "Manifesto on Seeds", 2013)[3]

Seeds of Struggle

In May 2014, in the context of my dissertation fieldwork, I attended a meeting in the district of Riosucio, located in the Colombian coffee-growing zone, to discuss recent conflicts over the property and circulation of seeds. The district of Riosucio comprises a "*mestizo*" town surrounded by four Emberá-Chamí autonomous

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[2] This article was originally published in https://www.alternautas.net/blog/2017/9/4/seed-sovereignty-struggles-in-an-ember-cham-community-in-colombia on September 4th, 2017.

[3] This article is a revised version of a chapter of my dissertation *The Political Ontology of Seeds: Seed Sovereignty Struggles in an Indigenous Resguardo in Colombia*. Email: laurittag@yahoo.com I am grateful to the anonymous reviewers for their feedback.

indigenous communities or *resguardos,* each with their own local government, called *cabildo.*[4]

Indigenous leaders from the *cabildos* and the Mayor's office attended the meeting, as well as local seed savers[5]. Seed savers are farmers who have a particularly strong interest in, and love for, conserving and developing heirloom seed varieties -which they often call *criollos*- for several reasons including better nutrition, soil conservation, ritualistic uses, and autonomy from the seed industry.[6] There were also representatives of NGOs affiliated with the Network of Free Seeds (NFS), a network that supports grassroots organizations that conserve and protect *criollo* seeds, and advocates against genetically modified (GM) seeds and intellectual property rights (IPRs) on plant material, among other issues related to food and seed sovereignty.

The saving and conservation of IPR-free *criollo* seeds as well as anti-GM activism are strong in Riosucio's *resguardos* due to several initiatives. The seed savers' networks are some of the most important and largest in the country. They are supported by the *cabildos* and a local grassroots agroecological organization of indigenous and peasant farmers called *Asociación de Productores Indígenas y Campesinos* (Asproinca). In 2009, the indigenous people from the Cañamomo-Lomaprieta *resguardo* declared their community a "Transgenic-Free Territory". This

[4] The four resguardos are Cañamomo-Lomaprieta, Escopetera-Pirsa, San Lorenzo, and La Montaña.

[5] In 2011, a leader from Cañamomo-Lomaprieta became elected as the first indigenous Mayor in the history of Riosucio.

[6] As Fitting, Wattnem and myself (in print) explained: "In Spanish, *criollo/criolla* refers to both landraces and creolized varieties, the latter of which are the outcome of an intentional or accidental mix of landraces with scientifically improved varieties. We use the Spanish term "*criollo/a*" –rather than native or traditional – because seed savers often use it, and it captures the fluid, active nature of seed varietal development."

declaration[7] forbids the implementation of any "food security and agricultural development programs that contain GM seeds, food, or technological packages that put at risk our traditional seeds, ancestral knowledges, and territory" (my translation). They also built a *Casa Comunitaria de Semillas* (Community Seed House), inaugurated in 2013.

The meeting took place at the Community Seed House. We sat on wooden benches outside the Seed House against the backdrop of coffee and plantain fields. I took notes –by request– while sipping coffee sweetened with *aguapanela*, a traditional beverage made of *panela*, an unrefined brown sugar. A heated discussion developed at the meeting regarding two instances of seed conflicts in the last two years. The conflicts arose between, on the one hand, Riosucio's indigenous municipal government, the *cabildos*, and the *resguardos*' seed savers. On the other, the Coffee and *Panela* Growers' Federations (*Fedecafé* and *Fedepanela*), and the Ministry of Agriculture –particularly ICA, its branch in charge of plant health inspection and safety.

In the first clash, Riosucio's indigenous municipal government and the *cabildos* refused the requirement to use ICA's certified seed in agricultural development programs sponsored by the Ministry of Agriculture *(Alianzas Productivas*, or productive alliances) to cultivate plantain, *panela* cane, and avocado. Instead, Riosucio's municipality started to supply such programs with *criollo* seeds, mainly from the Seed House and *comunero* farmers to boost local production. *Comunero* is the term used by indigenous people in Riosucio, and across the country, to refer to themselves. The term is meant to emphasize the 'communal' ethos that self-defines indigenous people.

[7] Available at http://www.rallt.org/LIBRES/COLOMBIA/Colombia%20Canamomo%20y%20Lomaprieta.pdf

Manuel, a seed saver and municipal government employee, recalled with indignation that ICA ordered them to use certified *panela* cane seed brought from the northeastern Department of Santander and endorsed by *Fedepanela*.[8] The local administration refused to use such seed, arguing that local producers held the right to "cultivate their own varieties that are adapted to the area". In relation to plantain, Manuel explained that ICA, after much discussion, agreed to allow local producers to use seed from their own plantain crops for the *Alianzas Productivas*. However, ICA forbade farmers who did not have plantain crops of their own to obtain seed from their neighbors. It ruled that the municipality bought certified seed from a specific ICA-approved plant nursery, located in the nearby town of Chinchiná, to supply those farmers.

The Mayor's office and the *cabildos* clashed a second time with representatives from *Fedecafé* over maize seed supply for the food security programs this Federation sponsors among coffee-growing farmers. According to Manuel, *Fedecafé* is giving away ICA's certified maize seed to *resguardo* farmers. These indigenous farmers, especially non-seed savers, may lack the political and ethical commitment to growing *criollo* seeds. They are also often unable to turn free seeds down, given their economic vulnerability, particularly in the context of low prices. Official food security programs then harm the *cabildos*' food sovereignty programs that use *criollo* seeds. Furthermore, Manuel and other indigenous leaders fear that ICA's maize – specifically ICA V-305– is contaminated with transgenes from imported GM varieties, which are cheaper than domestic ones in the market.[9] Juan, another Emberá-Chamí leader, passionately called on *comuneros* to start the process to declare their *resguardos* as Transgenic-Free Territories, following the lead of

[8] In this article, I use pseudonyms to protect the identity of the Emberá-Chamí people I worked with. All testimonies were collected during dissertation fieldwork in 2013-2014.

[9] Imported GM maize is cheaper than *criollo* maize because its production is highly subsidized in comparison to domestic one. In addition, there is the progressive elimination of trade tariffs on foreign agricultural goods, including maize, due to the US-Colombia FTA.

Cañamomo- Lomaprieta. He argued that such declarations were necessary in order to:

> "demand from all of these central government authorities and growers' federations that they use in their programs seed from our municipality, our region, our own seeds. Seeds that have a history, a process, that are not contaminated. We have to assert our autonomy as well as ICA's own norms that forbid growing GM maize in indigenous *resguardos*.[10] Otherwise, in the near future, we are not going to be the municipal government any longer and they are going to impose that all *resguardos* have to use certified seed."

In this article, I argue that struggles around seed commons in Riosucio's *resguardos* are at the center of broader issues, namely indigenous rights to territory, self-government, and the defense of their own agricultural practices. Following Arturo Escobar (2008), I contend that seed conflicts are part of larger conflicts over autonomy and '*modelos propios,*' or place-based ways of inhabiting and sustaining themselves in the territory. More specifically, they are struggles for seed sovereignty, or for the autonomous control of the ways in which seed –as a collective heritage– is produced, owned, circulated, saved, and endowed with meanings and spirituality (Kloppenburg, 2010). In this sense, seed sovereignty is an integral part of food sovereignty and self-government.

Good and Bad Seeds: Coloniality of Nature and Knowledge

Seed sovereignty initiatives in Riosucio have become politicized in the context of the struggle for indigenous territory, identity, and self-governance. Even though these Emberá-Chamí *resguardos*conserve their colonial *resguardo* titles, they have lost their language and other identity markers to be mobilized as further legitimacy of

[10] Juan is referring to ICA's prohibition to cultivate GM crops inside of –and within 300 meters or 1,000 feet– of indigenous *resguardos*.

their indigeneity before the State and non-indigenous Colombian society in order to demand Constitutional rights to political autonomy and territory.[11]

The coloniality of power in the Americas –racialized forms of power that classified people according to their distance to Eurocentric modernity that continued after Independence from Spain– thus implied restructuring subsistence systems -and the associated knowledges and nature-human relations. In other words, the coloniality of power constructed Latin American nature and place-based agricultural and botanical knowledges as inferior to European ones (Escobar, 2008; Alimonda, 2010). The persecution and/or denigration of *criollo* varieties of maize, bean, plantain, *guarapo*, *chirrinchi* and other staple crops and foods –scornfully called Indian or poor people's food/crops– is thus a long-term historical process.[12] To be sure, since Colonial times, American plants and foods central to indigenous cosmovisions and subsistence, such as quinoa or amaranth, became outlawed and deemed symbols of savagery and non-civilized life.[13] Currently, the advent of the Green Revolution –and the New Green Revolution where GM seeds figure prominently– continue to subordinate the diverse worlds of agricultural practices and knowledges that belong to indigenous, afro-descendant, and peasant communities around the world. In this context, *criollo* seeds stand as a powerful indigenous symbol of alterity and resistance in Colombia.

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[11] During colonial times, the Spanish crown created *resguardos* as indigenous territories and granted titles to these communities. The 1991 Constitution recognized Colombia as a multicultural nation and granted ethnic-based rights to minorities. Accordingly, indigenous people gained the right to self-government unlike mixed-descendant people, such as peasants.

[12] *Guarapo* is a sugar-cane fermented drink. *Chirrinchi* is its distilled form.

[13] A well-known case is that of *chicha*, a pre-Hispanic beverage made of fermented maize. As an ancestral drink, *chicha* has been considered unhygienic, unhealthy, stupefying and violence-prone, reproducing long-held racist violence and ethnocentric views of the indigenous world. As a result, *chicha* has been actively persecuted and forbidden until recently. For instance, Simón Bolívar outlawed *chicha* in 1820. During the 1930s, the Colombian government persecuted *chicha* producers and consumers to benefit the nascent beer industry that was associated with civilized European life and culture.

Since the 1970s, in Riosucio –and across the Colombian coffee-growing region–, the Colombian Coffee Growers' Federation (Fedecafé) promoted the Green Revolution to replace the 'traditional' model of diversified coffee cultivation – known as 'coffee-forest'– with mono-cropping, the increased use of agrochemical inputs, and the rationalization and 'scientific' management of coffee production, including improved sun-grown seed varieties (Corrales, 2002). The transition from the coffee-forest polycropping model to high-input monocropping implied the loss of *criollo* seeds –and associated knowledges– of a wide variety of subsistence crops, trees, roots, and medicinal plants previously grown in home gardens or alongside coffee.[14] Emberá-Chamí farmers in Riosucio refer to this process as the loss of subsistence crops, the switch to a less nutritious diet, ecological damage and, in general, the intrusion of capitalist market relations in all aspects of life from buying food in town to the need for credit to buy agro-chemicals that led to indebtedness. Juana, a local seed saver, associated coffee expansion to a form of re-conquest (*reconquista*) of indigenous territories, ways of life, and seeds:

> "Coffee expansion was a *reconquista* that displaced our own agriculture, our own *chacras*[plots] in favor of coffee mono-cropping that destroyed the watersheds, the forest. With the coffee bonanza, people dedicated themselves to growing coffee only and forgot about the traditional medicine, seeds, and diet"

Nonetheless, indigenous farmers in Riosucio also recognize that Fedecafé has brought some prosperity to the region. Fedecafé's institutional framework provides,

[14] One important caveat. The designation of *criollo* to some seeds, and its association with indigenous identities and struggles is historically and contextually dependent in Riosucio. The clearest example is coffee which has been both a vehicle of coloniality and resistance. Coffee, native to Africa, was initially brought as a plantation crop to the Americas during European colonization. However, coffee arrived in Riosucio in the early 19th century, after Independence from Spain, due to a later wave of colonization by settlers from the region of Antioquia (Appelbaum, 2003). For indigenous people in Riosucio, shade-grown coffee varieties became 'traditional' or *criollas* after Fedecafé introduced sun-grown varieties, starting in the 1960s and based on the Green Revolution model.

particularly in times of neoliberal 'free' market policies, important protections in terms of income and social investment to vulnerable small-scale coffee farmers. For instance, Fedecafé's coffee varieties are not protected by intellectual property rights so farmers can obtain, reproduce, and exchange them freely within the country.

As explained further below, indigenous farmers in Riosucio associate the introduction of GM seeds as the newest expression of western capitalist agriculture that seeks to undermine their own production models, autonomy, and identities. *Criollo* and certified seeds –including GM seeds– have then come to differently embed the indigenous collective self, struggles, and racialized forms of oppression among the Emberá-Chamí people of Riosucio.

Sowing Seed Conflicts: Free Trade Agreements and the Enclosure of Seed Commons

To further understand these seed conflicts in Colombia, I draw from the literature on food regimes and, in particular on the concept of corporate or neoliberal seed regime. This regime involves a complex set of global structures, norms, and practices of seed governance and political economy, advanced through Free Trade Agreements (FTAs) and other neoliberal policies, which mostly benefit biotechnology corporations, such as Monsanto, Syngenta, or Bayer, and their local allies worldwide (McMichael, 2009; Otero, 2012). Its main institutions and practices include IPRs, biotechnology, the corporatization of plant science research, biosafety protocols, seed contracts and certification, seed banks, and bioprospecting.

In Colombia, the Corporate or Neoliberal Seed Regime became largely implemented since the US-Colombia FTA came into effect in 2012. On the one hand, the FTA encourage the expansion of imports and cultivation of GM varieties, especially maize for agrofuels and animal feed. On the other, this FTA mandated the implementation of a series of changes in legislation on IPRs and certification standards to adapt Colombian domestic law to US standards based on international

regulations set by the International Union for the Protection of New Varieties of Plants (UPOV) Convention of 1991 (hereafter UPOV 91).[15]

Colombia's adoption of UPOV91 contradicted the country's adhesion to the Convention on Biological Diversity and the Andean Community Decision 391 on Common Regime on Access to Genetic Resources. These international agreements call on countries to protect farmers' right to freely save and commercialize seed; forbid the patenting of living beings, except microorganisms, and of a wide range of genetic engineering methods and products; and require previous and informed consent as well as the fair and equal distribution of benefits derived from the use of genetic resources to the local communities (Gómez Lee, 2007; Góngora-Mera and Motta, 2014).[16]

Specifically, Colombia introduced modifications to the country's Criminal Code and seed quality standards for the enactment of patent-like breeders' rights that forbid seed saving of legally protected seeds and the requirement that farmers can only commercialize produce grown from certified seed.[17] Law 1032 of 2006, which modifies the Criminal Code, states that the violation ofbreeders' rights will be penalized with prison sentences that range between four and eight years, and fines

[15] The UPOV Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991 (UPOV webpage http://www.upov.int/portal/index.html.en) consulted July 19, 2016.

[16] Besides the CBD and the Andean Community regulations, Colombia was signatory of the ILO 169 Convention on indigenous and tribal peoples, the UPOV 1978 and had signed but not ratified the UN International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), commonly called the Seed Treaty. The US, in contrast, was not a member of any of these International Agreements but the UPOV, although in its 1991version and, like Colombia, has signed but not ratified the Seed Treaty.

[17] In Free Trade Agreements, this process is often referred to as the 'harmonization' of countries' domestic property law. As seen in the Colombian case, rather than a fair negotiation between the parts, biodiverse countries from the global south are usually pressured to adopt UPOV91.

between USD $7,000 and $400,000[18] for anyone who usurps breeder's rights for legally protected varieties (Grupo Semillas, 2011; Gutiérrez and Fitting, 2016). Between 2010 and 2012, ICA ordered the seizing of close to five thousand tons of seeds and the destruction of half of those based on its Resolution 970, which regulates seed production and commercialization.[19] The Network of Free Seeds (NFS) has challenged this legislation in court. For instance, in 2012 the Colombian Constitutional Court declared Law 1518, which adopted UPOV91, unconstitutional granting the NSF an unprecedented legal victory. However, UPOV91-based legislation has either not been repealed or unsubstantially modified.[20]

In Colombia, as elsewhere, the expansion of GM crops, particularly herbicide tolerant and insect resistant varieties of maize and cotton, has also tightened the control of biotechnology corporations over farmers. Besides being protected by patents and other forms of intellectual property, GM crops are legally tied to specific technological packages. The most well-known example are Monsanto's Roundup Ready GM seeds, which farmers must plant in combination with Roundup, the company's commercial name for glyphosate, a wide-spectrum herbicide. In addition, farmers are bound to buy seed stock every year in the case of GM varieties of hybrid crops, such as maize, because they lose the special characteristics engineered into them as well as their vigor –or plants' capacity to achieve their full growth potential– in subsequent generations.[21]

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[18] The fines range from 26 to 1.500 minimum legal wages. As of 2017, the minimum legal wage in Colombia is 738.000 pesos, which is equivalent to approximately USD$270.

[19] Documentary 970 denounces the seizing and destruction of rice seed in the town of Campoalegre, located in the southwestern Department of Huila.

[20] For further information, see Gutiérrez and Fitting (2016) and Fitting, Wattnem, and Gutiérrez (in print).

[21] In their aggressive search for seed's sterility through genetic engineering, biotechnology companies have developed seeds that are genetically modified to be infertile or to only produce viable seed if under the influence of specific chemicals. These 'biological containment' **

The expansion of intellectual property rights and GM crops has brought a renewed round of enclosures of seed commons, or what anthropologist Donald Nonini (2007) calls the 'wearing down' of commons. Rather than commons under the control of farmers, seeds are increasingly conceived, produced, and managed as human-made –that is, scientifically redesigned– commodities available for private property. The commodification and enclosure of seed commons –and life itself– is sustained by a form of (bio)hegemony or the "acceptance of a 'natural' order of capitalist relations of agrarian production" that takes for granted the commodification of life (Newell, 2009; Valdivia, 2010). Regarding agricultural biotechnology, such 'natural order' is based on a double reductionism –both genetic and economic– that furthers "the extension of the commodity realm to the molecular level" (McAfee, 2003: 209). In this way, seeds become a collection of genes that are decoded, manipulated, moved across different species, and switched on and off to "devise super crops that will bring about the end of hunger" (McAfee, 2003: 205). In turn these "new commodity fictions" cannot only be privately owned, but also "quantified, priced and traded" in global stock markets (Sullivan, 2010: 115-116).

Seed Sovereignty Struggles: Keeping the Seed Circulating Freely in the Territories

technologies are called Gene Use Restriction Technologies (GURTs) and Recoverable Block of Function; the ETC Group has named them 'Terminator' and 'Zombie' seeds. The UN has placed a moratorium on GURTs due to their serious menace to biodiversity and life in the planet. As a consequence, biotechnology companies have not been able to commercialize seeds modified using GURTS so far; however these companies are constantly trying to undermine the moratorium. See: ETC Group. 2007. "Suicide-Seed Sequel: EU's "Transcontainer" Turns Terminator into Zombie: http://www.etcgroup.org/content/suicide-seed-sequel-eu%E2%80%99s-%E2%80%9Ctranscontainer%E2%80%9D-turns-terminator-zombie

To analyse seed sovereignty initiatives in the broader context of indigenous struggles for territory, I focus on the Cañamomo and Lomaprieta Community Seed House. This Seed House, as others, preserves agrobiodiversity and 'traditional' or place-based knowledges to strengthen local seed provisioning and prevent what seed savers and activists refer to as 'genetic contamination' of *criollo*varieties.[22] It is a center for grassroots participatory seed development to produce agroecological and healthy seeds that can be adapted to the needs of small-scale food producers in Riosucio's *resguardos*and nearby communities. The Community Seed House is an illustrative example of how *criollo* seed conservation has become politicized in Riosucio in the context of larger struggles for indigenous territory, identity, and self-governance.

Seed Commons, Alternative Markets and Fair Prices

The Community Seed House buys seed from the *resguardos*' seed savers networks and from other networks and farmers as long as they are either *criollo* or commercial varieties that have been produced agroecologically or without the use of petro-chemical inputs. There are two kinds of indigenous farmers associated with the Seed House. One kind are the local seed savers who have a large variety of seeds, but do not produce them in great quantity. The other kind is the *cosecheros* (growers) who have a reduced variety of seeds –usually those that are most demanded by powerful merchants, such as supermarkets– but are larger-scale producers than seed savers. *Cosecheros* are important to provide large quantity of seeds for supplying *resguardos'* food sovereignty programs. The Seed House trains

[22] In contrast, scientists, biotechnology corporations, and government officials most often use the term 'gene flow.' Anti-GMOs activists and communities in Colombia, and across Latin America, reject the term because of its political neutrality: 'gene flow', in contrast with 'genetic contamination' conveys the impression that this is a 'natural' process and obscures the political struggles and controversies over GM crops. In this way, seed savers and activists contest the discursive power of techno-science and reframe the discussion on the impacts of GMOs on (agro)biodiversity.

cosecheros to produce seed agroecologically; however, they have a more "market-oriented" vision according to seed saver Rosa.

The Community Seed House provides an interesting case of how some indigenous communities in the Colombian Andes engage in what feminist geographers J.K. Gibson-Graham (2006) call 'community economies' or those in which "social interdependency (economic being-in-common) is acknowledged and fostered and new kinds of economic subjects are produced (301)". The Seed House constitutes a community seed economy in two aspects. First, its seed production and distribution systems maintain seeds as commons. Second, the Seed House´s staff takes decisions based on collective decision-making. For instance, seed prices are collectively set so that allocation of surplus is fair in seed purchase. Cañamomo and Lomaprieta seed savers associated with the Seed House developed Seed Internal Guidelines to define seed lending and purchase regulations, seed saving and conservation methods, etc.

The Seed House strives to maintain *criollos* as a common good by keeping seed outside the IPR system. It also provides a space for selling seeds without commodifying them as well as supports alternative market practices that allow for barter and reciprocity. For instance, according to the Seed Guidelines, if the farmer does not have the capacity to buy seeds, these are given for free. However, the Seed House requires recipients to give back up to 50% of the amount of seed they originally received after the first harvest in order to maintain seed provisioning.

During my fieldwork, there were heated discussions and a lot of anxiety among seed savers not only from Riosucio, but also from other communities affiliated to the Colombian Network of Free Seeds (NFS), regarding whether or not Seed Houses could sell and buy seeds. At a meeting, Eloisa, a Riosucio's seed saver, explained the issues at stake:

"We don't want to speculate with high prices [in seed]. We would like for the seed saver to have a high income from selling his seeds but that would imply that farmers would have to buy expensive seeds. We don't want that because it's an agroecological seed, then only higher-income people (*el estrato alto*) can access these

types of seeds. This is why we consider a fair price both for seed savers and for whoever acquires the seed. We don't want to make a business like seed companies do."

After several meetings and discussions, seed savers decided that seed prices would be set through a collective process of decision-making between seed savers and the Seed House staff, who are themselves indigenous farmers from the *resguardo*. This process aims to allocate prices to seeds that are fair to both seed savers –recognizing their effort and time in growing these seeds– and to low-income farmers who want to obtain such seeds. In fact, fair prices recognize that producing agroecological seed takes more labour and time than regular seed. For instance, the Seed House requires seed savers to de-kernel and select maize and beans by hand.

Rosa explained the ethical commitments that guarantee seed savers can earn a fair income to live in a 'system that functions with money' without turning seeds into a regular commodity for profit-making or that does not take into account the rights and needs –that does not take care– of farmers and seeds:

"We did the collective and conscientious exercise of analyzing this issue and we decided that what we pay to the seed saver is the labor, the time, the effort, the space in his field to produce this seed agroecologically. The cost recognizes all of that even though seeds have no price. But unfortunately we are in a system that functions with money. If only we could get on the bus and pay with a corncob or we had an alternative currency, that'd be ideal. What we do is to have fair prices, we don't sell [the seed] to anyone but directly to the producer or to an organization that we know is going to sow it and take care of it."

Accordingly, the labels on seed bags state: "This seed is not a commercial product. Its price is to recognize the seed saver's effort and dedication" (Figure 2). The Seed House reproduces the seed and sells it or redistributes it through barter or for free to *resguardo* families, to other seed saving networks, or to farmers who make the commitment to care for the seed. The seed bags also contain a statement that reinforces the strong relationship between agrobiodiversity and cultural diversity,

particularly in indigenous territories: "The Seed House is a meeting space for seed savers that recuperate, conserve, produce and exchange agroecological native and *criollo* seeds, which are a peoples' patrimony to strengthen culture and the development of indigenous communities."

What is a Good Seed? Epistemic Resistance and Seed Quality Standards

The Seed House engages in epistemic resistance by rejecting conventional schemes –used by ICA and seed companies to certify the sanity and quality of hybrid and GM seeds according to criteria that turn on yield, purity, and genetic homogeneity. *Criollo* seeds, in contrast, are considered unproductive and risky in terms of phytosanitary standards (Fitting, Wattnem, and Gutiérrez, in print). For Riosucio seed savers –and in general, seed savers associated with the NFS– certified seeds are produced in ecosystems that are different from their own; they are highly susceptible to climate conditions and poor soils that are often characteristic of peasant and indigenous farming; and they only work well in combination with expensive technological packages. In addition, they reject certified seeds for their centrality to export-oriented corporate agriculture that threatens peasant economies and agrobiodiversity through land grabs, seed commodification, food imports, and the genetic contamination of traditional varieties. In fact, seed savers refer to both hybrids and GM varieties as *semillas desmejoradas* or "degraded seeds," a designation directly challenging the primacy of scientific breeding and knowledges in so-called "improved" varieties.

Accordingly, the Seed House has developed its own standards of safety and quality creating a *Sistema Participativo de Garantías*, or Participatory Guarantee System (PGS). PGS constitutes epistemic resistance against hegemonic definitions of what is a 'good' seed. PGS is based on the knowledge that gives farmers the ability to preserve and develop heterogeneous varieties on their plots and to incorporate concepts and methods from agronomic sciences and genetics only as they deem appropriate. For instance, the Seed House staff requires seed savers to supply seeds adapted to local conditions, grown, and reproduced without the use of chemicals while also using conventional standards for germination, cleanliness, humidity, etc.

In short, as Rosa stated, PGS is about "trust and solidarity among seed savers, about knowing how the seed was grown and in which community."

The Challenges of Seed Sovereignty

Seed savers and authorities from Cañamomo and Lomaprieta are conscious that declaring their *resguardo* as Transgenic-Free is largely a political statement that is difficult to implement. First, it is not easy for farmers to identify GM from non-GM seeds and food. Second, seeds circulate rapidly and informally among farmers, and through the market and institutional programs, making it hard to control the use and propagation of GM seeds. Third, there are no large markets for *criollos*, and biotechnology corporations have powerful economic, legal and political instruments, such as IPRs and FTAs, to commodify and monopolize seeds. Fourth, seed savers and *cabildo* authorities are often unable to enforce the prohibition on GMOs among *comuneros*. These already marginalized farmers are often not in the position to reject free GM seeds from public and private institutions. Neither is easy for them to grow *criollo* varieties which produce is not accepted by merchants –or if so, at lower prices than GM–. Fifth, enforcement is difficult among local non-indigenous farmers who either lack commitment and/or hold economic, political and legal leverage to more easily circumvent the prohibition (Gutiérrez and Fitting, 2016). Samuel, a Riosucio seed saver, articulated these problems at the meeting in the Seed House:

"People are told not to sow GM seeds, but unfortunately there are not enough seeds and the fields are too small. Knocking down the cane or coffee to cultivate [*criollo*] maize is not profitable. In Escopetera-Pirsa [community], rich people who have their lands there, [they] are not going to knock down the grasses to grow maize and they do not care if there are GMOs. We need to find solutions to these issues."

Seed savers and indigenous authorities at the meeting also underscored the lack of awareness among *resguardo* authorities themselves on the threats of GM varieties. There was also concern in regards to the level of compromise with the conservation of *criollo* seeds for seed and food sovereignty and indigenous self-government,

autonomy and identities. Ricardo, a local leader, stated: "How committed are we really with this issue of TFT [Transgenic-Free Territories]. We go around approving resolutions left and right, but no one takes responsibility."

Seeds of Identity and Autonomy

> "In the process of losing the territory, seeds were lost. We can't speak of food sovereignty with seeds from abroad and distributed by official programs […], which do not germinate [because they are not adapted to the local ecosystems] and may carry the danger of [GM] contamination. So in the last years, indigenous communities became aware of this problem and began formulating communities' life plans. Based on those life plans, we formulated policies for food sovereignty. This is a political process of autonomy in defense of territory and culture, and of seed."

This testimony by Cañamomo and Lomaprieta seed saver Rosa illustrates how the defense of territory, identity, and *modelos propios* based on life, rather than development, plans are deeply connected to seed sovereignty initiatives in Riosucio, such as seed saving networks, the Community Seed House and the Transgenic-Free Territory Declaration. The defense and conservation of *criollo* seeds challenge the coloniality of knowledge and nature embedded in past and current forms of capitalist agriculture that hierarchically classify seeds, and associated agricultural knowledges and practices, according to their market value and 'improvement' by western techno-science.

These initiatives may then constitute a Community Seed Economy where growing, conserving, and exchanging seeds are not the result of purely calculative, disembodied market relations. For instance, seed prices are not based on the behavior of international markets, stock exchanges and biotechnology companies' board decisions. Rather, economic decisions are embedded in specific contexts and made according to seeds' diverse values –or the ability to satisfy a range of farmers' needs such as agronomical, nutritional/medicinal or ritual – as well as to moral considerations on fair prices for both consumers and buyers. In other words, there

is a collective commitment and struggle (with setbacks and conflicts) on the part of seed savers to maintain seed as commons –based on solidarity and reciprocity– despite the constant encroachments of corporate agriculture and government's seed and food policies.

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DIEGO SILVA[1]

Security and Safety in the Glyphosate Debate: A Chemical Cocktail for Discussion[2]

The WHO's International Agency for Research on Cancer (IARC) released on the 20th of March 2015 in Lyon (France) a controversial report stating that glyphosate, the world's most widely used herbicide, is probably carcinogenic for humans. The use of the word "probably" is meant to clarify that although there is a positive correlation between exposure to the chemical agent and cancer, other explanations (such as chance, bias, or confounding) could not be fully ruled out (International Agency for Research on Cancer 2015). While the debate triggered by this report has revolved around the agricultural uses of glyphosate at the international level, in Colombia the debate has been associated with the use of glyphosate to eliminate one of the main financial sources of insurgent groups: cocaine crops. Moreover, while the use of glyphosate in Colombia was banned for the eradication of illegal crops shortly after the release of the WHO report, its use remains unproblematic as a strategy of crop management for legal agricultural crops. How can these different responses to the evidence presented in the WHO report on glyphosate be explained?

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[2] This article was originally published in Alternautas on October 16th, 2016 and re-posted in http://www.alternautas.net/blog/2016/10/1/security-and-safety-in-the-glyphosate-debate-a-chemical-cocktail-for-discussion-r6xtd on September 22nd, 2017.

In this contribution I explore the ways in which the international debate on glyphosate's safety has been translated in Colombia to the local level, facing opposing groups with different understandings of what is vital to the reproduction of society. The debate invites us to consider the links between issues of safety (the protection of humans and the environment from herbicides) and security (the protection of the national population from groups labelled as enemies of society), based on different understandings of the "bodies" under protection (the human body, the political body, the social body). How are these bodies defined, prioritized and protected, and who bears the responsibility for this protection? What rationales of government are deployed for the management of safety and security concerns? The answers to these questions can shed light on the apparently contradictory ways in which the Colombian government has decided to respond to the WHO report with regards to the use of glyphosate for illegal and legal crops.

Glyphosate's Safety and Agrichemical Use

Farmers around the world have been using glyphosate to destroy and control weeds since 1974, when the agrichemical company Monsanto began marketing it under the commercial name "Round-up". The popularity of the herbicide has increased since the development of the so-called "Round-up ready" seeds, which have been genetically modified to withstand glyphosate: its use in the U.S went up from around 110 million pounds in 2002 to 283 million pounds in 2012 (that is, from 50 to 128 million Kg) (US Geological Survey 2014).

Although Monsanto's patent over glyphosate expired in 2000, the agrichemical giant still controls most of the herbicide's market. Its glyphosate products are registered in more than 130 countries and are approved for weed control in more than 100 crops (Monsanto 2015). As expected, the company reacted to the WHO report arguing that other scientific data did not support the results: "We don't know how IARC could reach such a divergent conclusion from the one reached by all other regulatory agencies around the globe," said Philip Miller, Monsanto's vice-president of global regulatory affairs (Monsanto Newsroom 2015). Miller referred in particular to an evaluation conducted by the German government on behalf of

the EU that was published in January 2015. Notwithstanding, the US Environmental Protection Agency (EPA), Health Canada, and the European Commission have also dismissed the risk of this chemical to people in the past, if used according to label instructions (Monsanto 2014). Still, however, the EPA is reviewing its opinion and has promised to take the findings of the IARC into consideration.

Miller's argument relies on the evidence produced by certain authoritative institutions. However, it is the authority of this type of regulatory agencies and their scientific assessments that have been questioned for other cases in the past. The U.S anthropologist James Scott, for instance, reminds us that the ecological effects of the infamous DDT were initially dismissed by regulators in the U.S: it was not taken into consideration that the evidence of the chemical's safety was based on examinations carried out by scientists under experimental conditions. It was ultimately the observation gathered by consumers that put pressure on regulators to make DDT illegal. As opposed to these scientific experiments, consumers observed the interaction of the chemical with the environment and bared witness of the effects of its residues being absorbed along the food chain (Scott 1999, 291). Thus, awareness of the real life field effects of the chemical arose from outside the scientific paradigm, as has been the case with glyphosate long before the WHO report was released, and as it continues to be today. Despite mounting social resistance to the renewal of the EU's authorization of glyphosate, it was granted on the 28th of June 2016.

Irrespective of the validity of the arguments both for and against glyphosate, the debate at the international level has revolved around the implications that the WHO report might have on the commercialization of glyphosate for agricultural purposes. Strong restrictions on the use of glyphosate would immediately weaken "Round-up ready" seeds as commodities because their marketed special feature would no longer be at a premium. One aspect of the socio-technical network that sustains the "Round-up ready" seed as a unique commodity would destabilize: the legality of its complementary merchandize glyphosate. It would be interesting to see

how securing a market for these seeds or the health of the population along with environmental safety will be weighed against one another in public debate. This comparison will influence official decision-making, further determining what will ultimately prevail in different countries.

Security and Glyphosate as a Chemical Weapon

This debate, however, is not limited to the agricultural use of glyphosate. The chemical has been applied for other purposes around the world, which influence the course of the debate at the local level. In Colombia glyphosate has been used to destroy illegal crops such as coca and poppy, whose commercialization finances insurgent organizations such as the FARC (Solomon et al. 2007). There are precedents of this strategy in the country from the early 1980s responding to pressures of the Reagan administration (Colectivo de Abogados "José Alvear Restrepo" 2016). However, official government commitment to the strategy dates from 1999 as part of the US financed "Plan Colombia", which sought to reduce the production of cocaine in the country by half (Daniel Mejia 2014).

For over a decade, Colombian and foreign scientists have published studies that recommend stopping the use of glyphosate for its negative effects over the environment (Relyea 2005), and over local communities (Veillette C and Navarrete-Frias C 2005). Others have documented its negative effects over human health in ways as diverse as dermatological conditions, as well as fecundity and mental problems (Sanborn et al. 2004) breathing difficulties (Sherret 2005) and gastrointestinal complications (Cox 1995). Moreover local communities have associated the use of the herbicide with the appearance of diseases amongst their population and livestock. Farmers have also claimed that glyphosate destroys their food crops (Tiempo 2015b). Despite these claims, there was little debate on the appropriateness of aerial fumigations at the governmental level until the release of the WHO report. Since then, ministries and other governmental bodies, including the president, have made regular pronouncements. In April 2015, the Ministry of Health Alejandro Gaviria recommended to "immediately stop aerial fumigations for the eradication of illicit crops" (Semana 2015). On the contrary, the Ministry of

Defence Juan Carlos Pinzon announced to the news radio RCN that fumigations would continue and the Inspector General of the country declared in the news radio station Blue Radio that such suspension would be a terrible drawback in the war against the FARC (BlU Radio 2015). Ultimately, it was the State Attorney General who described the trade-off as one between safety and security: "when choosing between the life of citizens and war against organized crime I believe that we should prioritize peoples' lives" (BlU Radio 2015).

The debate in Colombia pits those taking a position based on the precautionary principle who advocate for the suspension of fumigations against those who argue that ends justify the means. Therefore any measure that weakens the enemies of the state is legitimate. The first group seems to rely on a biopolitical logical framework, whereby citizens' integrity is at the core of the state's responsibility. The second perspective seems to be a thanatopolitical one, by means of which some parts of the population may be sacrificed for the sake of the stability of the nation as a whole (Foucault 1990, 137); it incorporates a kind of "reason of state", whose priority is to strengthen the state and its political body, by debilitating its enemies.

These two positions in Colombia are closely related to the main strategies that have been devised to manage the internal conflict. On the one hand, president Santos's re-election in 2014 was based on a campaign for peace that was linked to the negotiations with the FARC in Havana, Cuba. The president's position with regards to glyphosate is that the WHO report and the advise of the Ministry of Health should be heeded. This resonates with the opinion of the FARC leaders in Havana who claim to have witnessed the devastating effects of glyphosate but is contrary to the position of the United States, who backed up glyphosate against the WHO report (RCN Noticias 2015). According to the media, with this position Santos makes a statement about the necessity to rethink the strategies that have been used in the struggle against drug trafficking (Tiempo 2015a). On the other hand, the leader of the opposition in the senate and ex-president Alvaro Uribe worked during his administrations towards the military weakening of the rebel organization, even when that meant bombing a FARC camp in the neighbouring

country of Ecuador. Many members of his administration have been accused and condemned for human rights violations and corruption (Jorge Gomez Pinilla 2015). His position is that giving up glyphosate fumigations would mean surrendering an important weapon to be used against the enemies of the State.

The final decision was put in the hands of the National Drug Council to whom the President of the Republic entrusted the suspension of the fumigations, in following with the Supreme Council's ruling. Finally, the National Drug Council met on the 15th of May and, after three hours of discussion, it decided by a majority vote to suspend aerial fumigations of glyphosate as part of the internal struggle against drug trafficking. Safety had outshined security, but the discussion could be reopened in the future: indeed, shortly after the final peace agreement was signed between the government and the FARC in 2016, the country's attorney general requested to reauthorize aerial fumigations using glyphosate. Faced with rising coca crops in the country, and the presumed demobilization of the FARC, it is his opinion that other groups will try to take over the FARC´s drug business. This might in turn increase the levels of conflict. His request has not yet been accepted (Tiempo 2015c).

While one chapter remains closed in the security debate, the debate on safety in regards to the agricultural use of glyphosate is in its early stages. During the debate on security, the Minister of Agriculture Aurelio Iragorri had left the possibility to suspend the use of glyphosate for agricultural purposes open. Once the National Drug Council made the decision to suspend the aerial fumigations of illegal crops with glyphosate, concerns by environmentalist and farmers regarding the use of the herbicide for agricultural purposes seem to have been met. However, after the Council's decision, the Minister announced that glyphosate was still authorized for legal crops, including aerial aspersions for sugar cane and rice (Tv Journal - UNO). Agricultural geneticist and GMO promoter Alejandro Chaparro argued that while glyphosate should not be suspended, aerial fumigations of any crop are "absurd" (Portafolio 2015). This is because the wind can carry the chemical to non-targeted lands and water sources even if recommendations not to fumigate over 10 meters

above the ground are followed; a measure that is arbitrary, difficult to comply with, and impossible to monitor or enforce.

The government's response to the agricultural use of glyphosate begs the question: Why would the Colombian government expect anyone to accept different regulations for the use of glyphosate over legal or illegal crops in the light of the WHO's report? One argument stressed by the Minister of agriculture appeals to the distinction between public and private responsibilities. While the State is responsible for the aspersions against illegal crops, the minister argues that "every chemical product used in the agricultural sector carries certain level of risk, and it is the owner of the land, the producer or the farmer, who chooses the product to be used in his crop" (Portafolio 2015). Thus, while the State warns against the use of glyphosate on account of the potential harm to the health of its citizens, and decided to stop aerial fumigations of cocaine crops, individual actors as private persons may continue to use the product, even if it harms their soil and their health. Safety is thus turned into a matter of private choice and responsibility is transferred to the citizen-entrepreneur, while the government establishes regulatory guidelines and educates regarding risks. Security remains within the State's responsibility, while safety is shifted from the public to the private sphere.

Why such a shift? Analysing the differences between the safety and the security of an object, body, or system under protection might shed light on this question. Marie Line argues that "The inability of the system to affect its environment in an undesirable way is usually called safety; the inability of the environment to affect the system in an undesirable way is usually called security… Safety focuses on unintentional events, while security also focuses on threats coming from outside the system, often caused by malicious parties" (Maria Line 2006). Based on this definition I proposed a differentiation between safety and security measures that is by no means exhaustive but that allows me to tease out the different state responses of the Colombian government to the WHO report. We can think of safety measures, on the one hand, as linked to internal guidelines and practices set in place to protect the well functioning of a system (the human body, the ecosystem, the

state). Security measures, on the other hand, are related to strategies adopted in order to protect a given infrastructure, area, or population from external and often intentional attacks. From this perspective the border between safety and security is located at the border between what is considered to be internal to the object under protection (and that can be regulated through regulatory safety measures that guarantee the well functioning of a given system), and what is considered to be external to it (and that can be controlled through security mechanisms intended to prevent external attacks). Safety measures are closer to rationales of governing that regulate the circulation and flow of processes, commodities, diseases, etc, inside a system, while security measures are closer to disciplinary rationales of governing that prohibit external processes that could endanger it.

In relation to this, the Minister of agriculture put forward a second argument to explain why glyphosate should not be used to eradicate illegal crops but can be used for the management of legal crops. The argument points directly at the governmentality of the State's action: suspending the use of glyphosate for agricultural purposes would have negative consequences for the economy, as it would render Colombian farmers less competitive in international markets. In the private sphere, what is needed is therefore not prohibition but regulation: a balance should be found that allows for the circulation and flow of "Round-up ready" seeds and glyphosate without significantly affecting the population's health. This balance is mediated by safety regulatory guidelines (such as tolerance levels, and ways of application) that, however, often do not take into account the synergic effect of a particular toxic substance when combined with others even below their acceptace safety thresholds (Beck 1992, 66–68).

A thanatopolitical logic that was temporality ruled out from the security debate, where some may be sacrificed for the whole, returns. It is the safety of "the agricultural economy" and not the security of the State that is here weighed against human health. With the positive end of the peace agreements against the FARC and the expected demobilization of the FARC members, illegal crops can no longer be seen as the financial source of the external enemies of the State. Instead, the

FARC members will be internalized as political actors. As the enemies of the state disappear so do the external threats that they posed. Alternative though less efficient strategies to glyphosate can be considered for the eradication of illegal crops because they no longer represent an external threat to the state but an internal threat to human health. The trade-off between security and safety disappears. A different trade-off re-emerges when taking into account the agricultural economy: "The agricultural economy" is the State's responsibility too, and in this respect, an increase in agricultural productivity trumps health. The safeguarding of the economy has priority over safeguarding the health of the population.

Of Externalities and Chemical Cocktails

In order for the State to defend this trade-off two things must happen. First, the interests of all farmers need to be homogenized along the lines of an abstract "agricultural economy" that the State claims to represent. In other words, the object of protection must be defined, and it must be defined as the responsibility of the State while other vulnerable bodies are defined as the citizen's responsibility; secondly, agriculture must be isolated from the rest of society so that the externalities of the agricultural use of glyphosate remain outside of the public debate. A key element here is that the bodies under protection are portrayed as separate from each other. In this way, the protection of the agricultural economy is not in contradiction with the protection of the population's health or their environment. But how far can these fictional bodies of protection and their separation be sustained?

Through the first process all farmers are equated with large commercial farmers involved in agri-business, whose main economic interest is to be competitive at the international level. The interests of Colombian farmers, who have eschewed the use of agrichemicals and opted instead for traditional and agroecological alternatives are

ignored. During my field research on bio-safety in Colombia[3] I have worked with many of these farmers in Tolima and witnessed their efforts to not only protect local seed varieties but also to create polycrop ecosystems. Their primary goal is autonomy and self-sufficiency rather than competitive advantage. Their message is clear: there is more than just one agricultural economy in the country. In 2013, Colombian farmers from different backgrounds, sectors and scales gathered to make different demands to the government. For a month, they rallied towards the country's capital, blocked important roads and voiced their ideas in public fora, conferences, and meetings with civil servants. When talking about this strike, an indigenous leader from Tolima told me: "many farmers are asking for subsidies and lower prices in agrichemical products, but we are not. We just want to be able to transition back to our traditional type of agriculture." This is not to romanticize indigenous farmers, many of whom are involved in industrial agriculture at the same time, but to recall that "the agricultural economy" mobilized in State discourses is a homogenous abstraction that does not exist in reality. Defending an agricultural economy that needs glyphosate as a vital technology, despite its effects, does not equate to defending farmers' economies.

Through the second process the government presents a regulatory framework for the use of glyphosate, which would allow certain farmers to continue using the herbicide in an allegedly safe manner. The circulation of glyphosate in agricultural markets would thus not be in contradiction with the protection of the population´s health—at least, not insofar as the recommended regulatory measures are followed. The regulatory framework is however necessarily filled with simplifications and cannot rule out every possible negative externality. In the south of the corn-producing department of Tolima, for example, at a local "chicheria", one can order

[3] I carried out fieldout the first semester of 2014 in the department of Tolima Colombia and the second semester of 2015 in the department of Cordoba. My ethnographic work traced the links between biosafety regulations that addressed the potential risks of GMOs and the commodification of GM cotton seeds.

"chicha", a fermented beverage made out of "traditional" (i.e. non-GM) corn, but get a "Randazo" instead. As a local "chicha" producer told me: "Round-up ready corn is not good for chicha because the beverage just does not jell, so we go through a lot of effort to protect our corn varieties". Ironically, chicha is now commonly served in "Round-up" bottles, which are recycled after being thrown away by farmers. "Randazo" is the local name for this cocktail that may contain residues of a "probably" carcinogenic substance: glyphosate. Many people from different segments of society come to these places: industrial and non-industrial farmers, and people who do not have any contact with farming at all. Should it also be up to the consumer to know what Round-up is and ask for a different bottle when buying "chicha"? In addition to wondering about the finances of the FARC or about an abstract agricultural economy, should we not learn from DDT consumers by asking how glyphosate (regardless of its use for legal or illegal crops) is being absorbed along the food chain?

This reflection is important not only because it problematizes the arguments mobilized in the Colombian discussion, but also because it directly points towards the relationship between individuals, society and the environment. To recall James Scott's observation above, by prohibiting the use of DDT, the environmental residues of the chemical from where humans obtain their food were reduced, which in turn improved human health. Scientific studies that argued in favour of DDT´s safety were based on the effect of the chemical over the human body in experiments that were necessarily limited in space and time. These studies, however, did not take into consideration the chemical´s cumulative effects as its environmental residues increased and reached human populations. Human bodies are clearly connected to their environment and their protection cannot be decoupled from the protection of the environment with which they relate. The human body is an open system that interacts with social decisions and natural elements, or in other words, the body's borders are a blurred construction.

The constructions of these bodies as separated from each other make it possible to compare the State's security and the aggregate agricultural economy's performance

as opposed to the safety of individuals and the environment. Stemming from Scheper-Hughes and Lock's categories (Scheper-Hughes and Lock 1987), some groups will prioritize the individual's body, whereas some will put forward the social body and yet others will advocate for the protection of the political body. The Colombian debate is ultimately a discussion about how these bodies are constructed, which of these bodies should be protected against external or internal threats, and by whom. Less emphasis is however given to their interconnections. This omission creates an obscurity that, on the one hand, allows the State to prioritize the health of the individuals vis-à-vis the peace talks and the WHO report, but on the other hand, it allows for its undermining, ignoring what happens in concrete cases in local environments as far as an abstract aggregate agricultural economy is concerned.

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INGRID ELÍSABET FEENEY-MCCANDLESS[1]

Por una Vida Digna: Science as Technique of Power and Mode of Resistance in Argentina[2]

"¡Andrés Carrasco, presente!" A tall man with sun-weathered skin and long chestnut hair which fell in tangled spirals down the back of his threadbare brown sweater had just addressed a crowd of about 100 people, young and old, who were gathered in the drafty, crumbling gymnasium of a high school in Paraná, Entre Ríos, Argentina one Friday evening in June of 2016.

The crowd had gathered for an event months in the making--- a panel discussion called "Con la Soja al Cuello" organized to bring awareness of the socio-environmental impacts of the expansion of genetically-modified soy monocultures in rural Argentina to the urban denizens of Paraná. The gymnasium was strung with colorful banners displaying messages like "Los agrotóxicos matan, la indiferencia también" (Agrotoxins kill, indifference too), "Justicia por Nicolás Arévalo"[3] (Justice for Nicolás Arévalo), and "Una bomba química nos extermina en silencio" (A chemical bomb is exterminating us in silence).

Groups of students, teachers, and community members sat in rows of folding chairs, bundled in scarves and sweaters, passing ornamented gourds of steaming

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[2] This article was originally published in http://www.alternautas.net/blog/2017/22/9/por-una-vida-digna-science-as-technique-of-power-and-mode-of-resistance on September 22nd, 2017.

[3] Child victim of death by agrichemical fumigation.

mate back and forth amongst each other with the requisite combination of graciousness and nonchalance. At the front of the room, the panel speakers sat at a folding card table draped with a banner depicting Argentina being hung by a noose, along with the phrase "Con la Soja al Cuello" (With Soy at the Neck).

The event had begun with a screening of the award-winning short documentary "El Costo Humano de los Agrotóxicos" (The Human Cost of Agrotoxins), a lurid portrait of environmental suffering in rural Argentina. Then, each of the three panelists spoke. The first speaker was Estela Lemes[4], "la maestra fumigada" (the sprayed or fumigated teacher), a rural school teacher whose repeated experiences with agrichemical contamination thrust her into the spotlight of national media. The second was Sofía Gatica, winner of the Goldman Environmental Prize and member of Las Madres de Ituzaingó[5]. The third was Dr. Damián Verzeñassi, physician and professor, director of the School of Medicine at the University of Rosario, Argentina.

The speakers each employed personal anecdotes and alarming statistics about accelerating degradation of the environment and public health to argue vigorously against transgenics and agribusiness, and for an immediate transition to agroecology. After the panelists had finished, the floor was opened for questions and comments, and several community members stood up to offer passionate and erudite expressions of anger, hope, and the need for organized resistance. The last comment was made by the tall, chestnut-haired man with whose comment I began this essay. He spoke on the need to implement a two-pronged strategy--- fighting the hegemony of agribusiness while simultaneously building an alternative from the ground up. As he began to wrap up his thoughts, he paused and said:

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[4] As everyone mentioned in this essay is a public figure, names have not been changed.

[5] Women's environmental justice group from Córdoba who won an unprecedented court case involving aerial fumigations in their barrio after a 10-year struggle. They continue their struggle, now divided into 2 groups.

"*Vienen por los minerales*
Vienen por la tierra
Vienen por el agua
Vienen por el aire
Vienen por los alimentos
Y vienen organizados.
Tenemos que luchar.
Es mentira que sí se puede--- es necesario trasformar la realidad!
Tenemos una responsabilidad muy grande en nuestros manos
Y es ponernos a estudiar."

(They're coming for the minerals
They're coming for the land
They're coming for the water
They're coming for the air
They're coming for the food
And they're coming organized.
We have to fight.
It's a lie that 'yes we can'--- we have to transform reality!
We have an enormous responsibility in our hands
And that's to get studying.)

The crowd erupted in raucous applause. *"¡Andrés Carrasco, presente!"* (Andrés Carrasco, here!) The crowd cheered even louder.

This article examines the contested role of science in current controversies over agricultural biotechnology in Argentina. I will illustrate some of the ways science has been used as both a crucial pillar of the legitimating discourse of agribusiness, and also as tool of anti-GM mobilizations, paying special attention to the lionization of the late microbiologist Andrés Carrasco who sacrificed his career to publish a seminal paper on the health impacts of glyphosate (Paganelli et al. 2010).

GM Soy in Argentina: Environmental and Health Impacts

Historically, Argentina produced a diverse array of agricultural products such as beef, wheat, corn, sunflowers, rice, and wine. In the last 20 years, however, Argentina's agricultural landscape has been dramatically transformed by the widespread adoption of GM soy, facilitated by the neoliberal restructuring of the Argentine economy under the administration of President Carlos Menem (Lapegna 2015) and extended under the 'post-neoliberal' Kirchner years (Cáceres 2015). Locally this process is known as sojización or "soyification."

While soya expansion in the region is promoted by powerful actors as a 'green' way of encouraging rural development and energy independence, and the technology has been appealing to many growers due to its simplicity of use, the soyification development model has created conditions of threatened food sovereignty and environmental crises such as deforestation, leaching, erosion, soil and water degradation, and chronic flooding (Newell 2009; Teubal 2008; Turzi 2011). La Via Campesina estimates that around 200,000 rural families have been forced off their land since 1996 due to the advancement of the soy frontier in Argentina, leading to a large-scale displacement of rural populations to metastasizing slums on the urban periphery of major cities such as Buenos Aires (Auyero 2000; Teubal 2008; Goldfarb and Zoomers 2013; Hetherington 2013).

Today, about 65% of arable land in Argentina is planted with transgenic soy (Goldfarb and Zoomers 2013). The soy frontier is currently pushing further and further into the lowland forest region of the Gran Chaco, which together with the Amazon has long been known as one of the two Lungs of the Americas.

It is undeniable that the GM soy boom has produced an array of grave socio-ecological problems in Argentina, but perhaps none has been so devastating as the problem of agrochemical contamination. In 1996, the year of legal introduction of transgenics, 821,000 kg of glyphosate were applied within Argentina's borders. By 2014, this figure had reached 88,000,000 kg (Benbrook 2016).

This rapid and dramatic increase in glyphosate use has been implicated in a major public health crisis for the nation's rural poor. Problems attributed to glyphosate

contamination include skin irritations; respiratory and neurological problems; kidney malfunction and renal failure; reproductive disorders, spontaneous abortion, and birth defects; and a sharp increase in incidences of cancer, leukemia and lymphoma (Aranda 2017a; Benítez et al. 2009; Vazquez et al. 2017).

"En la Argentina la Biotecnología es una Política de Estado"[6]

Mobilization against GM agriculture has been minimal in Argentina as compared to other countries, despite these far-reaching consequences. Peter Newell (2009) has argued that resistance from rural and urban publics has been constrained due to a "biohegemonic" cooperation between state and capital which precludes effective mobilization against GM soy. Pablo Lapegna (2014; 2016) provides insight into the complex "politics of demobilization" that occurred in rural Argentine communities between 2003 and 2009 whereby collective action and resistance to the negative socio-environmental impacts of GM soy attenuated to negotiation and accommodation.

Newell argues that hegemony is achieved by the biotech industry through its seizure of institutional and discursive power. Because the industry contributes so significantly to Argentina's economy, it enjoys heavy influence in politics and almost exclusively positive depictions in dominant media. "The hegemonic discourse in Argentina regarding agricultural biotechnology is that it represents an important, economically significant, socially beneficial, safe, and environmentally benign technology" (Newell 2009:53). As dissenting counter-narratives have been strategically marginalized,

> ...the question of whether and on what terms agricultural biotechnology should be adopted as a core element of economic policy, which has produced such intense social and political conflict in other countries, has continued to be a 'non-issue' in Argentina (ibid., 54).

[6] "In Argentina, biotechnology is a state policy." - Jorge Rulli, Grupo de Reflexión Rural.

Pablo Lapegna (2014; 2015; 2016) argues that early mobilizations against GM agriculture lost momentum not only due to clientelism and "patronage politics," but also because peasants who complained about contamination were frequently humiliated by local officials and powerful soy growers. For example, he recounts an instance where women in a Northern Argentine community suffering the impacts of pesticide drifts were told that their children's skin lesions were the result of poor hygiene, not agrichemical contamination, and that they should learn how to use soap (Lapegna 2014: 11-12).

Both Newell's and Lapegna's work demonstrates that agribusiness has seized and maintained power by monopolizing claims to legitimate knowledge and marginalizing other narratives about the impacts of biotechnology. Science, then, is a major field in which the struggle for environmental justice and territorial sovereignty is playing out.

Technoscience in Argentina

Argentina Innovadora 2020 (Innovative Argentina 2020), The National Plan for Science, Technology, and Innovation Strategic Guidelines for 2012-2015, begins with a collection of quotes from then president Cristina Fernández de Kirchner, each extracted from a speech she had made before a gathering of scientists (figure 2). It is notable that each quote emphasizes, in no uncertain terms, that the role of science is to bolster economic growth and to "add value" to the economy. Perhaps most striking is the following quote:

Además de ser excelentes productores de materias primas tenemos que ponerle a toda esa materia prima mucha ciencia, mucha innovación, mucha tecnología, mucha articulación entre el sector privado y nuestras universidades, porque eso es lo que hacen todos los países desarrollados del mundo para agregar valor. La unidad del conocimiento con la economía es el rasgo distintivo que le queremos imprimir

al crecimiento del Tercer Centenario en la República Argentina, y estoy segura de que lo vamos a hacer (Argentina 2011: 8-9).

In addition to being excellent producers of primary materials we need to infuse those materials a lot of science, a lot of innovation, a lot of technology, a lot of articulation between the private sector and our universities, because that's what all the developed countries of the world do to add value. The unity of knowledge and the economy is the distinctive trait which we seek to impress upon the burgeoning Third Century in the Argentine Republic, and I'm sure we're going to do it.

Given the historical and ongoing asymmetry in the relationship between so-called 'core' and 'periphery' nations, it is understandable that a president of Argentina would want to make moving beyond the status as primarily an exporter of raw materials a part of her platform--particularly when said platform is largely predicated on reversing the neoliberal reforms of the Menem administration. However, that Kirchner proposes to accomplish this not by, for example, revitalizing manufacturing, but instead by encouraging "articulation between the private sector and the university" and "the unity of knowledge and the economy," partially explains why scholars have argued that the Kirchner years are more accurately characterized as "neo-extractivist" than "post-neoliberal" (e.g., Cáceres 2015). The state's emphasis on the cultivation of a science and technology squarely focused on "increasing productivity" has led to an accelerated extractivism and staggeringenvironmental injustice that has led many in the science community in Argentina to ask "Ciencia para qué y para quiénes?[7]" (Science for what and for whom?)

[7] Guillermo Folguera de CONICET - Ciencia para qué y para quiénes? Guillermo Folguera of CONICET – Science for what and for whom? Accessed March 14th, 2017 - https://www.youtube.com/watch?v=n6PVPUfWCOo

Science for Sale? The Global Controversy over Glyphosate Herbicides

The impact of glyphosate on human health is the subject of fierce contestation on a global scale. Proponents of the herbicide argue that it is lethal to plants yet essentially nontoxic to vertebrates (Du Bois and Freire De Sousa 2008), and is quickly broken down into harmless substances within the larger environment (USDA 2002). However, glyphosate has been linked to several serious maladies in independent scientific studies, including cancer, kidney malfunction, and reproductive disorders. For example, Benachour et al. (2007) observed a link between glyphosate-based products and cell cycle deregulation— a hallmark of tumor cells and human cancers ---and linked glyphosate exposure to adverse effects on human reproduction and fetal development. Gasnier et al. (2009) documented disruption of endocrine and kidney function at well below "acceptable" levels of contamination. Benítez et al. (2009) linked glyphosate herbicides to congenital malformations in an epidemiological study of women living among GM soy fields in the Paraguayan Chaco.

In March of 2015, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, reclassified glyphosate as a "probable carcinogen" (WHO 2015), highlighting a previous IARC study which found evidence linking glyphosate exposures to doubled risk of non-Hodgkin lymphoma. Since the WHO reclassification, more than 1,100 lawsuits have been filed against Monsanto by farmers, landscapers, and agricultural workers in the United States who claim that their lymphoma was caused by exposure to Roundup (Monsanto's patented glyphosate-based herbicide). In March of 2017, a federal judge in San Francisco unsealed documents which reveal that Monsanto has exploited relationships within the Environmental Protection Agency to ensure prolonged regulatory approval of glyphosate despite accumulating evidence of its negative health impacts. The unsealed documents further suggest that the paper most often cited as evidence of the herbicide's innocuousness (Williams, Kroes, and Munroe 2000) was ghost-written by company scientists and then signed off by Gary

Williams, a pathologist at New York Medical College, and his co-authors (Cornwall 2017; Hakim 2017).

In Argentina, a 2009 review by the Ministry of Science and Health entitled "Evaluación de la información científica vinculada al glifosato en su incidencia sobre la salud y el ambiente" (Evaluation of scientific information related to glyphosate in its impact on health and the environment) concluded that there was a lack of evidence that glyphosate negatively impacts human health (CONICET 2009). The official report, which was vigorously criticized by civil society organizations and scientists from public university, repeatedly cites the work of the purportedly "independent" academic Gary Williams to defend the safety of glyphosate (Aranda 2017b).

Andrés Carrasco: Ciencia Sin Patrón[8]

> *La ciencia no es neutral ni objetiva. La ciencia siempre tiene ideología y un sentido político. La ciencia puede aportar a la liberación o al sometimiento. La ciencia puede ser aliada de las corporaciones o estar al servicio del pueblo*.
>
> (Science is neither neutral nor objective. Science always has ideology and a political sense. Science can contribute to liberation or submission. Science can be allied with corporations or be at the service of the people.)
>
> --- Andrés Carrasco, Declaración Latinoamericana por una Ciencia Digna (Latin American Declaration for a Dignified Science).

Andrés Carrasco was a microbiologist who specialized in embryonic development, and was at one point the president of CONICET (Argentina's National Scientific

[8] Science without a boss. Aranda, Darío. "Homenaje a Andrés Carrasco: Ciencia Sin Patrón." La Vaca. N.p., 30 July 2014.

and Technical Research Council). Having been made aware of the environmental suffering of rural communities, Carrasco decided to research the possible effects of glyphosate on human health by conducting tests on frogs. When he discovered the effects to be astoundingly strong, he decided to release his results to the public. He contacted Darío Aranda, one of the few journalists sympathetic to the plight of rural communities, and in April 2009 his story made it to the front page of Página 12, Argentina's main progressive newspaper.

Almost immediately, the anonymous threats began pouring in on the telephone, and a group of lawyers working for CASAFE[9] stormed his office looking for papers and other research documents. Lino Barañao, the Argentine Minister of Science and Technology rushed to publicly discredit Carrasco's research, and, as was later revealed in an email leak, privately implored that the head of the National Committee of Ethics in Science and Technology censure the microbiologist on ethical grounds (Adamovsky 2014). It was further revealed by Wikileaks that the US Embassy also lobbied against Carrasco during this time (ibid.). A paper was quickly published which condescendingly refuted Carrasco's claims, and was later linked to Syngenta (Fagan and Robinson 2012). In August 2010 Carrasco was almost lynched by a mob of landowners and local politicians while in the Chaco for a speaking engagement. In 2013, CONICET declined his petition to be promoted to the highest category of the public research system (Adamovsky 2014).

Carrasco's life as a well-respected but generally unknown (outside of the narrow field of embryonic microbiology) scientist was over. But his life as a leader and icon of an insurgent movement had just begun. He became an ally and advocate for the marginalized communities who were fighting the dispossession, displacement, and contamination generated by the technologically-driven expansion of the agricultural

[9] The Cámara de Sanidad Agropecuaria y Fertilizantes (The Chamber of Agricultural Sanitation and Fertilizers), an association that gathers together the main agrochemical corporations in Argentina.

frontier. Alicia Massarini, biologist and colleague of the late Carrasco, recalls that the scientist "did not position his study as absolute truth, but rather as a contribution that made sense together with other ways of knowing--- those of the communities that for years have suffered, resisted, and insisted that agrochemicals sicken and kill," and notes that his legacy has reinvigorated debates initiated in Latin America by Oscar Varsavsky, Amílcar Herrera, and Jorge Sábato about the non-neutrality of science and the need for a 'pueblo-centric' model of investigation and innovation (Aranda 2014).

Before Carrasco died of a heart attack in May of 2014, he formed important networks and alliances that persist, even as he cannot. The Red de Científicos Comprometidos (Network of Committed Scientists) is a growing network of scientists and academics in Argentina, Mexico, Ecuador, Costa Rica, and Brazil that are guided by the principles of the Latin American Declaration for a Dignified Science (Carrasco 2014). The declaration, penned by Carrasco days before his death, does not stop short at the condemnation of glyphosate, but inveighs against agricultural biotechnology and other forms of extractivism as neocolonial pillaging and declaims forms of scientific investigation that are complacent in this corporatist neocolonial project.

Día de la Ciencia Digna

"Carrasco ya es semilla."

Carrasco is a seed now.

--- Darío Aranda

On 16th June (Carrasco's birthday) 2014 at the School of Medicine of the University of Rosario, a group of scientists, activists, and community members instituted The Day of Dignified Science (UNR 2014) not only as an homage to the legacy of Carrasco, but to bring into being a network of militant 'pueblo-centric'

scientists ("científicos comprometidos"). The day has since been expanded to a week during which, all around Argentina, panels and workshops take place discussing the socio-environmental consequences of extractive GM agriculture, the role of science in perpetuating the model, and the responsibility of a "committed," "pueblo-centric" science in taking it down. Colleagues Guillermo Folguera, professor in the History of Science at the University of Buenos Aires, and Damián Verzeñassi, director of the Instituto de Salud Socioambiental (Institute of Socio-Environmental Health) at the National University of Rosario in particular carry on Carrasco's legacy. In October of 2016, Verzeñassi delivered a damning testimony at the first International Monsanto Citizen Tribunal at The Hague. His testimony was based on the results of an eight-year-long and running epidemiological study in 27 rural municipalities in Argentina. When he returned to Rosario, he found his office and lab, with 96,800 clinical histories inside, locked with chains.

Conclusion: "*Ciencia para Qué y para Quiénes?*"

A recent (2017) report of the UN Special Rapporteur on the Right to Food criticizes the transnational corporations that manufacture pesticides, accusing them of "systematic denial of harms," "aggressive, unethical marketing tactics" and heavy lobbying of governments which has "obstructed reforms and paralyzed global pesticide restrictions."

The report is unambiguous, stating that pesticides have "catastrophic impacts on the environment, human health and society as a whole," including an estimated 200,000 deaths a year from acute poisoning (UN 2017: 14-19).

The first International Monsanto Citizen Tribunal at The Hague concluded on April 18th 2017. The mock trial, overseen by five judges, was a symbolic international ruling which found Monsanto guilty of "crimes against humanity and ecocide" and concluded that the leaked documents alleging Monsanto influenced the EPA "make hollow the so-called scientific controversy about the risks

glyphosate poses on health."[10] The judges called upon civil servants, lawyers, and judges to heed their ruling and change international law to hold the company accountable.

Can a ciencia comprometida deliver justice to the thousands of Argentines suffering the devastating consequences of the expansion of agribusiness in Argentina? While legions of militant 'pueblo-centric' scientists gathering under the banner of Ciencia Digna is certainly cause for excitement, previous work in Science and Technology Studies gives reason for tempering one's optimism with respect to the ability of (even the most well-intentioned) expert knowledge to deliver justice in environmental justice struggles:

In a political context where contentious issues of equity and justice are frequently removed from public debate by transforming them into narrower scientific questions, EJ [Environmental Justice] activists' efforts to mobilize science to contest environmental injustices may simply reinforce larger patterns of scientization without giving them any strategic advantage (Ottinger et al. 2017:1047).

I see this dynamic playing out in Argentina, with some actors[11] frustrated that criticisms of biotechnology have been abandoned in favor of a focus on glyphosate, which is, at the moment, an easier target speaking in narrowly scientific terms. Still, Ciencia Digna goes further than mere reformism, arguing instead for a reimagination of what science can be and do, and for whom. In a recent paper, Martín Arboleda argues for a reimagination of class consciousness along scientific lines, thus highlighting the radical potentialities immanent in the current scientific relations of production:

[10] See http://www.monsanto-tribunal.org/

[11] Guillermo Folguera: "¿Porqué tenemos que discutir si el glifosato envenena? Que por eso fue generado."

In the face of the heightened proletarianization of scientific and intellectual labor that defines our era, a microscope or a computer program can exert violence toward the intellectual laborer, nowadays increasingly overworked, indebted, and alienated. However, such instruments of production can also revolutionize her consciousness and will in politically progressive ways (2016:12).

Such arguments highlight the importance of fighting deep cuts in science funding by both the Macri and Trump administrations, which jeopardize the ability of 'pueblo-centric' scientists to imagine and bring about a more just world.

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JONAS KÖPPEL[1]

The imperial rationality within BioTrade: A contribution to the neoextractivist debate[2]

In this article I address a recent debate on neoextractivism in Latin America by presenting ethnographic research on BioTrade[3] in Peru. While biodiversity conservation is usually not associated with extractivist projects, such as open-pit mining or industrial monocultures, the case study on Sacha Inchi[4], presented hereafter, reveals the same basic patterns of resource extraction: a logic that places the requirements of global markets over local realities; that chooses the needs of exporting firms over the concerns of the rural populations; and that favors the perspective of the capital over that of its hinterland. My basic findings lead me to interpret BioTrade, in this case, as a form of neoextractivism. It claims to pursue goals of social equity and environmental sustainability, while in practice adopting the same imperial rationality as the century-old extractivist project, characteristic for Latin America. Thus, this article contributes to the debate by reminding of the social, or "cultural", preconditions for (neo)extractivism, namely the "coloniality of power" (Quijano, 1992), and thus the construction, subordination, and

[1] JONAS KÖPPEL is a PhD student at the Institute for Anthropology and Sociology of Development at IHEID in Geneva.

[2] This article was originally published in http://www.alternautas.net/blog/2017/10/14/the-imperial-rationality-within-biotrade-a-contribution-to-the-neoextractivism-debate on October 14th, 2017.

[3] BioTrade is a global conservation policy that aims to establish incentives for preserving biodiversity by promoting its sustainable economic use (see below for more information).

[4] Sacha Inchi is a plant native to the Amazon region that produces a seed with a high content of essential fatty acids (particularly Omega-3) for which it is marketed globally as a "super food".

exploitation of the Other. In a post-structural reading it suggests that, in the contemporary arena of sustainable development, the neoliberal rationality constitutes a mechanism that reproduces colonial lines of social differentiation by creating difference along the lines of the ability to live up to its emblematic figure of the entrepreneur.

The term *neoextractivism* describes a contemporary political-economic reality in many Latin American countries, which in recent decades have experienced a renewed economic focus on extractive and rent-based activities. Driven by the growing global demand for natural resources, and the rising prices for raw materials since the turn of the millennium, both so-called progressive and conservative governments have been following strategies of a "developmentalist neoextractivism" (Svampa, 2012), which promote state-led social and economic development by employing the rents obtained from commodity exports. In response to these new, and in many ways contradictory realities of contemporary political economy in Latin America, a debate around the implications of this "new extractivism" has emerged since Gudynas (2009) introduced the term. On the one hand, some see neoextractivism as a valuable means to fight the still menacing neoliberal policies of the political Right by strengthening the role of the state in national development (see Dávalos, 2013; or García Linera, 2012). On the other hand, critical observers have challenged the model's ability to overcome the fundamental contradictions they regard as inherent in the capitalist model as a whole. Much of the critique concerns the externalization of the social and environmental costs of these strategies, which are "characterized by large-scale enterprises, a focus on exportation, and a tendency for monoproduction or monoculture" (Svampa, 2015, p. 66; see also Gudynas, 2013; Brand & Dietz, 2014, pp. 132–133).

Initially, my research was not about neoextractivism at all. I set out to study the interactions between a global policy for sustainable development (BioTrade) and its declared local beneficiaries (smallholders growing Sacha Inchi). I followed a "new ethnography of development" approach (Mosse, 2005; see also Mosse & Lewis, 2006) to study BioTrade as a social practice from a number of different

perspectives. In 2016, I conducted four months of field research on several levels – from international Geneva to metropolitan Lima and rural villages in San Martín – interacting with a variety of actors – from local smallholders to government officials and international cooperation staff.

The analytical categories of a broadly defined political ecology framework helped me make sense of the case I was investigating, starting with the fundamental insight that issues of "nature" are inseparable of the social realm, and of the power relations that reign within it. In a post-structural reading, I conceived of development as a form of (neoliberal) "governmentality" (Foucault, 2007, 2008), and as a way of "improving" the colonial Other (Li, 2007). Yet other political ecology perspectives helped me understand the "environmental histories" of the places I was visiting – histories that are deeply marked by a "coloniality of nature" (Alimonda, 2011, p. 47). Following this approach, and maintaining a focus on the smallholders throughout the whole process, I discovered the same imperial rationality in the realm of sustainable development that one would usually expect in emblematic cases of (neo)extractivism such as open-pit mines or the soy frontier. These points will become clear once I develop my argument further below. First, I will set the stage by sketching out the broad lines of the case study on Sacha Inchi promotion in San Martín.

Biotrade and Sacha Inchi in the Peruvian Lowlands of San Martin

BioTrade is an UNCTAD[5] initiative, founded in 1996, that aims at conserving biodiversity by promoting trade in its products. It originated in response to the questions posed by the UN Convention on Biological Diversity (CBD) and is thus closely related to the concept of sustainable development. Peru was among the first countries to adopt BioTrade as a policy tool in order to achieve the novel targets of the national biodiversity strategy. The framework promises to reconcile the goals of

[5] United Nations Conference on Trade and Development

economic growth, poverty reduction, and conservation of biological diversity. Efforts have mainly consisted in creating value chains destined for export markets for so-called natural ingredients and products, originating from native plants. The economic use of these resources, and the higher income for the rural producers, would provide incentives to conserve the country's natural wealth.

As a native plant from the Amazon region, Sacha Inchi was one of the first products promoted by this initiative. Its name originates from the Quechua term *Sacha Inchik*, which translates literally to "peanut of the mountain", or more adequately to "wild peanut". It has been known to the native populations for hundreds of years but local consumption has practically disappeared. Instead, it entered recent history in the 1990s as a valuable foodstuff in the eyes of researchers, and as a promising export product for business men from the capital city. Its seed has an extraordinary high content of essential fatty acids (particularly Omega-3) and proteins, which qualifies it as a "super food". More recently, it has been promoted as a sustainable export crop for smallholders, perfectly suited as a promising value chain for the promotion of BioTrade.

San Martín was selected as a priority area for the national BioTrade program. It is in this part of the Peruvian lowlands (*selva alta*) where the commercialization of Sacha Inchi originated, and it has been maintained for more than fifteen years. The region has a long history of interaction with global markets, consisting basically in a series of economic cycles or "booms" starting at the end of colonial times (Maskrey et al., 1991). In the middle of the 20th century, it was incorporated into the Peruvian economy as a national land frontier – as an area that should serve as the "national pantry" (*despensa nacional*). Large-scale corn and rice monocultures partly displaced the diverse, intercropped fields of the smallholders, who were further

driven up the hitherto wooded hills. After commodity prices had collapsed in the 1980s the coca economy[6] dominated the region until the end of the century.

In response to the wide-spread cultivation of this illegalized plant, projects for "alternative development" (*desarrollo alternativo*) have been present in San Martín, promoting alternative commercial crops[7] to discourage coca production. More recently, these efforts have adopted a *green*logic that is directed at making San Martín into a shining example of sustainability. According to the predominant discourse, this has transformed the "former[ly] unproductive region [that] was populated by scattered subsistence farmers, drug cartels, and terrorist groups [into] a world-class example of sustainable entrepreneurship, innovation, and social inclusion" (de Pereny, 2015, p. 159). Evidently, BioTrade and the promising export crop Sacha Inchi – native of the region and produced organically by local smallholders – fit perfectly into these recent dynamics.

The Unstable Course of a Commercialised Crop

However, not all the promises that were made with the commercialization of Sacha Inchi have been kept. An apparently paradoxical finding of my field research in San Martín is that smallholder producers have been adversely affected by producing Sacha Inchi, although they are the stated beneficiaries of the BioTrade projects that have been promoting it. The regional market for Sacha Inchi seeds has been characterized by a very high volatility in both price and demand, with three

[6] During its peak period, approximately 55% of Peru's coca was cultivated in San Martin while the country was the main producer worldwide. Roughly half of the region's economic value was produced through its cultivation and processing into coca paste, the main intermediate product for cocaine (Cabieses, 2010, p. 3). The coca economy and its violent control measures through the state and international actors dramatically transformed the livelihoods of the rural population.

[7] The currently most important crops include coffee, cocoa, oil palm, or palm hearts, among others. They all share the common ground of being destined for extra-local markets (national or export) (Cabieses, 2010, p. 6).

recurrent downturns in the last fifteen years. The attractive properties of this newly commercialized plant excited entire villages and within a year or two production rose rapidly. But demand could not keep pace and eventually became saturated. Similar to a traffic jam, market outlets were limited while agricultural production kept increasing. The result was a flooded informal market where the prices dropped to almost zero in just a few months, inducing an outright depression in the local economies. Farmers abandoned their Sacha Inchi fields and shifted (back) to other crops, effectively destroying the productive base of the value chain. After about a year, the resulting scarcity gave rise to a new price surge, thus reproducing the unstable market dynamics. Many rural families did not possess the resources to properly weather these turbulent developments. Their livelihoods being rather vulnerable, they were affected quite heavily by the downturns – up to the point of food scarcity.

One main reason for the fragility of the regional raw material market can be found in the fact that, through the novel value chain, smallholders were incorporated quite directly into global markets. The exporting firms passed on the pressures of the fluctuating global environment to the very beginning of the chain. For instance, as a consequence of a decline in demand following the global financial crisis in 2007/08, most intermediary firms stopped buying Sacha Inchi seeds for several months. The rural households in turn rarely disposed of the resources necessary to absorb and endure these pressures. The risk they were taking exceeded their financial capabilities, but the comparatively high profit margins of the crop had led many to abandon their corn fields and plant Sacha Inchi instead. Thus, the interaction between the global market environment, uneven relationships between the main actors of the value chain, and local decision making and resource endowments resulted in regional dynamics that were dramatic for the smallholder producers, while at the same time hindering the commercial success of Sacha Inchi as a novel product.

In order to stabilize the market and finally consolidate this seemingly promising product on the global market, BioTrade promotion strategies have been focused on

a hand full of "responsible"[8] processing firms as the "critical juncture" of the chain. The sector has been managed through Public Private Partnerships, initiated and financed by the international cooperation[9]. The latter convinced the regional authorities to accept Sacha Inchi as a valuable resource, and to adopt its commercial promotion as an official strategy for the (sustainable) development of San Martín. Through the arising projects and activities, a rather small group of urban "professionals" formed around the common goal of establishing Sacha Inchi as a new product. As "trustees" (Cowen & Shenton, 1996) they are supposed to bring about "improvement" for San Martín, and especially for its rural population. The implementation of BioTrade policies thus has given rise to a set of diverse actors with a seemingly common purpose – and yet with rather diverging perspectives.

The national government officials, project managers, and decision-makers in Lima are hardly aware of the turbulences in the regional market. Export figures for Sacha Inchi products have been on a constant rise over the past decade. Thus, from the viewpoint of the actors in the capital the market presents itself as a promising vehicle for sustainable development. In the regional arena, awareness is only marginally higher. Relatively seen, I would argue, farmers risked and lost more than any other actor in this value chain by betting on Sacha Inchi. However, their risks and losses are hardly ever recognized by the other actors involved. Put starkly, the raging ups and downs of the raw material market are dismissed as mere supply chain issues, hindering the commercial consolidation of the value chain.

In light of these developments, I would argue that in this case BioTrade adopts an extractivist logic on its way of implementation. It starts with the supposedly harmonious balance between conservation (Bio) and economic use (Trade) shifting towards the latter end: biological diversity is merely seen as a natural resource to be

[8] Firms for Public Private Partnerships are selected according to certain criteria of social and environmental responsibility, defined within the global and national BioTrade frameworks.

[9] In particular the German GIZ and the Swiss SECO.

used for national or regional development. As a consequence, instead of starting from the local level of the smallholders as the central actors for conserving biodiversity, efforts are concentrated on the intermediary firms as the "critical juncture" for getting Sacha Inchi into far-off markets. Ultimately, the commercial promotion of the plant, which was regarded as the means at the outset, becomes an end in itself: BioTrade is merely about bringing a valuable resources out of the Peruvian hinterland to promising green markets at the other end of the globe. In this process, the smallholders get reduced to their functional attribute: providing raw material.

The Neoextractivist Face of Biotrade

Not only is there a lack of recognition for the realities of the local populations in the rural villages of San Martín. Smallholders are also seen as a major cause for the turbulent course of the raw material market, and thus as culprits for the instability of the value chain as a whole. Their behavior is met with incomprehension and depicted as "irrational". For instance, they are accused of being reluctant to invest in the crop, of refusing new farming techniques, or of being unreliable and disloyal to their buying firm. However, within the project of sustainable development, and particularly BioTrade, they are effectively unavoidable – being the declared beneficiaries and central actors for conserving biodiversity in the field. Thus, they assume the role of a "necessary evil". It is here, I argue, where we have to look for explanations to grasp the neoextractivist face of BioTrade in Peru.

In order to better understand the smallholders' role as "necessary evils", we have to consider the social realities of neoliberalism in Peru, and their interaction with colonial lines of social differentiation. In a post-structural reading, neoliberalism is to be seen less as a distinct set of (economic) policies or the corresponding ideology. Rather, it is conceived as a political *rationality* that places the entrepreneur at the center of contemporary Peruvian society (Comité Editorial Revista Anthropia, 2014). That is, we are talking about "specific mechanisms of government, and

recognizable modes of creating subjects" (Ferguson, 2010, p. 171). More specifically, neoliberal rationality is about "making the market, competition, and so the enterprise, into what could be called the formative power of society" (Foucault, 2008, p. 132). One important set of these "mechanisms" – or "technologies" in Foucaudian terms – have been the social policies increasingly applied since the "second-wave" (Ewig, 2011) of neoliberal reforms in Latin America. These have implied a redefinition of poverty where the "poor" are "those excluded [...] from effectively participating in the market and becoming masters of their own destiny" (Schild, 2000, p. 286). The so-called beneficiaries are conceived, and thus constructed, as entrepreneurs of themselves, as capitalists who invest in themselves and live off their profits – and cope with their losses. That is, neoliberal rationality acts upon the individual as such, as a technology for producing and configuring subjectivities that correspond to the emblematic figure of the entrepreneur – an economic-rational actor responsible for the consequences of his or her own behavior (Sacchi, 2016, p. 29).

What does all this mean for the smallholders producing Sacha Inchi in San Martín? To make a long story short, the prevailing entrepreneurialism leads to the expectation for them to act "rationally". They ought to strive for more, for a better future, in order to surpass themselves and their supposedly miserable condition. They ought to invest in their business, take risks and adopt novel technology, in order to "modernize". The vibrant, highly lucrative, green export market promises benefits for all; an opportunity for everyone, ready to be grasped. But the turbulent course of the regional market clearly reveals that the material realities contradict the neoliberal discourse of win-win and equal opportunities for all. The typical smallholder livelihood in San Martín does not follow the same logic as a capitalist enterprise. Often, the very survival of whole families depends, quite directly, upon the farming activities of its members. The resources that rural households possess, in turn, are usually not sufficient to weather the risky undertaking of being directly integrated into global markets. It is in this contradiction where the perfidy of neoliberal rationality lies: it obscures the material inequities with its discourse of

equal inequality and thus attributes the inevitable failure to the realm of self-responsibility.

However, the failure of the smallholders to expand their economic activities, their inability to bring about personal development, is not confined to the sphere of the individual. Trustees themselves are conceived as neoliberal subjects, as entrepreneurs that ought to self-responsibly bear the risks that life entails. Agricultural extensionists, for instance, are remunerated according to their performance of bringing about measurable progress towards achieving the targets of development projects. Thus, they depend upon the success of those they are expected to "improve" – their own livelihoods rely on it. On a more abstract level, too, the discourses of sustainable development and social inclusion connect the fate of the urban "professionals" to that of the rural populations in quite a peculiar manner. In the drive of bringing progress to the region on its path towards modernity; on the rise out of the provincial insignificance of a national hinterland, those who do not follow the prescriptions are not only left behind. Rather, they are depicted as the backward Other, as an obstacle on the path towards improvement.

Thus, the smallholders face the social imperative to act like entrepreneurs as a condition to be recognized as citizens, as valuable members of modern society. At the same time, their material position hardly allows them to do so because they lack the resources for bearing the risks of global market integration. By denying these structural inequalities, neoliberal rationality attributes blame to certain societal groups and thus reproduces existing lines of social differentiation. Particularly, in Peru indigeneity has long served as an explanation for poverty, or the lack of modern development. During the *state indigenism*[10] of the 20th century, for instance, being indigenous was effectively conflated with a poor socio-economic

[10] State indigenism was a set of political strategies to integrate the indigenous population into the modern nation-state. Specific socio-economic and educational policies aimed to overcome the indigenous condition in order to transform the "backward" indigenous into "modern" citizens (see Tuncay, 2015, pp. 5–6).

condition, while cultural backwardness served as an explanation for this condition (Tuncay, 2015, p. 5). As Tuncay (2015) demonstrates in the case of a conditional cash transfer program, contemporary policies still follow the same rationale. In relation to natural resources, emblematic discourses like *the beggar sitting on a bench of gold* suggest that Peru has been blessed with an abundance of natural resources but so far has failed to "transform itself from a beggar into a king". They thus picture the country's population as "incapable of using that wealth to raise itself out of poverty" (Drinot, 2006, pp. 12–15). As former president Alan Garcia not long ago demonstrated with his "dog in the manger" discourse[11], the indigenous and mestizo populations are still blamed for the country's failure to bring about national development (Drinot, 2014).

From a political ecology perspective, these social structures of race-based subordination have been "co-produced" (Grimmig, 2011) with the predominant conceptualization and use of "nature" as a resource to be exploited: The historical project of extractivism, which has been based the "coloniality of power" (Quijano, 1992), has also implied a "coloniality of nature" (Alimonda, 2011; see also Brand & Dietz, 2014, p. 142). The case of BioTrade in Peru reveals striking parallels to the century old pattern of extractivism. Biological diversity is identified as a national resource, as San Martín's comparative advantage, and as an opportunity for sustainable development. Thus, along its way of being "translated" (Mosse, 2005) into practice, BioTrade adopts a logic that places the requirements of global markets over local realities; that chooses the needs of exporting firms over the concerns of the rural populations; and that favors the perspective of the capital over

[11] In his essay series published in 2007 and 2008, Garcia lamented the unused potential of the vast resources hidden in Peru's hinterlands and called for a more productive use for national development through privatization, capitalization, and mechanization. Referring to an ancient Spanish play about "the gardeners dog" that doesn't want to eat but doesn't let others eat either (*no come ni deja comer*), he implicitly referred to the rural (and particularly to the indigenous) population supposedly refusing to develop but at the same time refusing to sell their land for more "productive" use.

that of its hinterland. As the case of the Sacha Inchi farmers in San Martín demonstrates, the "neoliberal rationality" (Foucault, 2008) divides the regional population according to their ability to live up to the emblematic figure of the entrepreneur. It thereby reproduces the century-old structures that separate the "modern" from the "backward", the "urban" from the "rural", the "white" from the "indigenous".

However, the considerations made above also point to change. Through the project of sustainable development the Other seems to have assumed a new role: that of a necessary evil. The beggar sitting on a bench of gold, then, might again have changed its shape in contemporary neoliberal Peru. The underlying logic – the social relations of power – however, have remained the same. Thus, what the case analyzed here has made visible are the workings of century-old colonial patterns in the contemporary guise of sustainable development, or in other words: a form of new extractivism. It discursively puts the Other center stage, while in practice reproducing the exclusionary and subordinating patterns of its classical equivalent.

Conclusion

In the paragraphs above, I presented research on the commercial promotion of Sacha Inchi in the Peruvian lowlands of San Martín. The case study reveals the transformation of BioTrade policies into an undertaking that reduces biological diversity to its exchange value, and those who are supposed to cater it to raw material providers. Taking a closer look at the role of the smallholder producers, I argued that their inability to act like neoliberal subjects – as entrepreneurs that grasp the opportunities of global markets – lets them assume the role of an obstacle within the project of regional development. Thus, the contemporary neoliberal rationality interacts with colonial lines of social differentiation, reproducing them through the very denial of their existence. My interpretation of these findings is that, in this case, BioTrade policies and practices have adopted a (neo)extractivist logic.

Thus, (neo)neoextractivism affects areas one would hardly expect at first. Sacha Inchi has been explicitly promoted in the name of conserving biological diversity and of reducing rural poverty: as an alternative crop for sustainable smallholder agriculture. Within the logic of value chain promotion, national transformation processes have been at the forefront BioTrade policies, in order to ensure that value added stays within the Peruvian economy. In fact, it has been officially prohibited to export Sacha Inchi as a raw material. Nevertheless, taking a closer look at how BioTrade policies have been implemented in San Martin – paradoxically a region without any "classical" natural resources – I find the same basic patterns of resource extraction and the corresponding social relations that have characterized the country's history for centuries.

Accordingly, I contest Gudynas' (2013) endeavor to delimit the term to phenomena that imply the overexploitation of natural resources (the externalization of environmental and social costs), and their export as raw materials to global markets (in contrast to *national* economies). In my view, it implies too much a narrowing to an overtly materialist perspective. Rather, I would follow Brand and Dietz (2014) who, in an attempt to theorize the phenomenon from a political ecology perspective, conceive of (neo)extractivism quite broadly as an historically contingent form of capitalist resource appropriation, and thus as an expression of prevailing relations of power, intrinsically linked to the continent's colonial past. It is a crucial insight from the political ecology perspective that (neo)extractivism is not only problematic because of its (destructive) effects on the environment, or its political-economic consequences, but at least as much because it implies a specific "coloniality of power" (Quijano, 1992); that is, a particular formation of power relations that has been "co-produced" (Grimmig, 2011) throughout the long history of extractivism in Latin America.

In a way, then, I would argue that this case study reveals a crucial precondition for (neo)extractivist projects such as oil extraction, open-pit mining, or industrial agriculture. In a field distant from these emblematic manifestations it reminds us of the imperial rationality that these undertakings have always implied: extraction

requires the existence – or rather the construction – of a passive, unproductive Other to be exploited; be it in the realm of nature or that of society. As I have been arguing, neoliberal entrepreneurialism might constitute one contemporary mechanism that contributes to this process of (re)producing difference. Understanding how these social power structures and their relation to nature have come about and are reproduced in different contexts, I suggest, is crucial for grasping the phenomenon that has been termed neoextractivism; and even more so if nature is to provide a basis of life for all humans – including those yet to be born. In particular, this implies shedding more light on "extractivist cultures" (Gudynas, 2013, p. 7) – how they emerge, are reproduced, and disseminate; for they have been crucially shaping world views and policy prescriptions in Latin America for centuries. As in the case of Sacha Inchi in San Martín, they might still be transforming ideas and practices, including in areas we may not expect at first.

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ALEXANDER LIEBMAN AND HENRY A. PELLER [1]

¿Y si no en Habana? Landless science, peasant struggle, and capitalist development in Colombia [2]

On November 30th 2016, the Colombian government and FARC signed a peace agreement despite its narrow rejection in a national plebiscite two months earlier. The Havana Accords promise to end five decades of civil war. Among the FARC's central objectives in the negotiations was agrarian reform. This, in order to resolve the highest land inequity in the Western Hemisphere and the accumulated centuries of violent injustice onto the rural poor. About 80% of agricultural land in Colombia is concentrated among 14% of landowners (USAID 2010). Land is most often used for export production and extensive cattle production. From the Andean highlands to the Eastern Plains, cattle dominate the landscape, occupying 80% of agricultural land, often the most productive areas. Another 40% of Colombian territory is under contract with multinational productions for agriculture, forestry, or mining export (OXFAM 2013). Inequality of land access is also borne unequally across race and gender – Afro-Colombians and women facing the highest levels of

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internal displacement due to rural conflict and agri-business land accumulation (Gomez 2012).

Unfortunately, among the consequences of post-plebiscite negotiations include the substantial weakening of agrarian reform. There is little to suggest that change to the *status quo* is on the horizon with the Havana Accords, a conclusion that the anti-capitalist left (and actually many more liberal Colombian intellectuals) had reached long before the peace doves and white linens.

We became interested in the question of agrarian reform in Colombia while conducting soils research at the International Center for Tropical Agriculture (CIAT) – the South American outpost of the world's largest agricultural development institute, the Consultative Group in International Agriculture Research (CGIAR). During a semester of research on soil carbon dynamics in grazed agroforestry systems, we kept wondering: If not agrarian reform, what do foreign and Colombian elites offer as a resolution to the deep contradictions of rural Colombia? The contradictions were glaring – food production on precarious hillsides, alluvial valleys dominated by extensive monocultures, masses of displaced rural people surviving in the urban informal economy.

More concretely, what did the CGIAR and CIAT have to say about land?

After all, CGIAR's stated mission is: 'to advance agricultural science and innovation to enable poor people… [to] share in economic growth and manage natural resources in the face of climate change and other challenges' (CGIAR 2016). After analyzing a decade of public archives from CGIAR and CIAT, our findings support our initial hypothesis: on land, CGIAR science maintains abject silence. It would follow that land must not be a challenge that rural poor people face in Colombia.

How do we explain this silence, and what fills the void? More precisely, what does 'landless science' tell us about the relationship between science and capitalism in Colombia? In this piece, we synthesize key features of capitalist development and land conflict in Colombia. We then move to discuss the ideological and political

contributions of international agro-science in this history.[3] We argue that CGIAR science serves precisely to relieve the contradictions of rural Colombia *without* addressing land.

Historical Political Economy of Colombian Agriculture and Land

How can we explain the roots of Colombia's land conflict, and what does this have to do with the failed plebiscite in November 2016? We begin at the onset of colonial violence. Many pages of Colombia history through the 16th to the 20th century are scribed with genocide and enslavement of indigenous peoples, plunder of raw materials, and colonization of arable land. Semi-feudal social relations characterized the Colombian countryside, with large-scale haciendas and latifundios[4] in fertile valleys, and a mix of impoverished peasants in the peripheries. In the late 19th century, coffee bean production became the key crop that integrated Colombian capital into global agro-commodity markets, which have diversified and expanded ever since.

During the 20th century, there has been little change in the general strategy for capitalist development. The template is to convert oligarchic and upper peasant holdings into export-commodity operations, while enrolling middle peasants into

[3] For examples of a breadth of alternative agronomic institutions and agroecological science and social movements operating in Colombia, see articles such as Leon-Sicard et al. 2017, Altieri et al. 2017, and university and autonomous organizations such as the agroecology working group at UNAL Palmira, Agencia Prensa Rural, Fensuagro, Red Nacional de Agricultura Familiar, and the Instituto de Agroecologia Latinoamericano "Maria Cano"

[4] *Latifundios* are large landholdings, dependent on large numbers of agricultural laborers, as opposed to *minifundios* or peasant landholdings that are smaller and have historically comprised the basis of Colombia's subsistence economy (USAID (2010). *Latifundios* formed the basis of conservative rural political relations in post-colonial Colombia, geographically located in the eastern cordillera regions of Santander, Cundinamarca, and Boyaca (Hylton 2014). The historical dynamics of *latifundios*, their conflict with urban finance and the rise of Colombian export commodity production, and 20th century associations with paramilitary, extrajudicial violence, are outside of the scope of this paper but have been explored in-depth by Machado (1999), Grajales (2011), and Hylton (2014).

the supply chain and deliberately eliminating lower peasants.[5] The first phase of development began with a 1936 law to displace sharecroppers from latifundios. After World War II, Colombia was the first country in the world to receive economic and military loans from the World Bank in order to reduce "revolutionary pressures" (Chasteen, 2001: 277). During the next decades, debate raged over the nature and content of the reforms. Keynesians placed the lower and middle class peasants at the center of development strategy to produce cheap foods and relieve rural poverty. Winning the debate, however, were monetarists who argued for large-scale export enterprises. Lauchlin Currie, a chief architect of the World Bank development policy, proposed a pathway of 'accelerated economic development' via a process that De Janvry characterizes as "the elimination of the peasantry, the strengthening of commercial farms, and the absorption of the rural poor into the urban labor force" (De Janvry 1981, 162). On its own terms, the strategy has been enormously successful in rapidly expanding the agro-export sector of Colombia.

On the terms of the rural poor, however, the story is different. As Hector Mondragon writes:

> Currie and today's dominant class in Colombia believed in trying to remove the 'primitive' farmer by 'pull' or by 'push'... Unable to remove the farmers by consent, the [civil] war became a programme of 'deliberately accelerated mobility', or one in which coercion replaced economic forces (Mondragon 2000, in Brittain 2005).

[5] We employ the distinctions of 'upper', 'middle', and 'lower' peasants to highlight class mobility (or lack thereof) among peasants in rural Colombia during the 19th and 20th centuries. This corresponds with a description of 'junker' versus 'farmer' patterns of development (Lenin 1974). In the 'farmer' pattern, some peasants are able to accumulate capital and concentrate the means of production, corresponding to an ascendancy into a rural bourgeois class. Meanwhile, the majority of peasants lose control of the means of production and maintain a precarious, subsistence existence or are proleterianized (De Janvry 1978). The rural bourgeois 'upper' and 'middle' peasants largely share political control with bourgeois interests.

Alongside expansion of capitalist agriculture, a 'second Colombia' has persisted in the rural periphery. These regions inhabited by lower peasants have received minimal state investments in infrastructure and public services. Parallel to the initial influx of World Bank development funds, conflict between agrarian elites and rural poor sparked multiple uprisings, such as the violent strikes against United Fruit Company and protracted violence during the 1940s and 50s. Many of the components that would come to define Colombia's civil war – extrajudicial killings by secret police, violent expansion of agricultural territory, and organized self-defense among peasant groups – emerged during this time.

Since its founding in the 1960s the FARC embodied the latter tendency of peasant self-defense by setting up armed rural communes that threatened large landholders and state control. While the FARC's demands for land redistribution resonate today, they failed to transform guerilla activity into a tractable worker-peasant political alliance. This is largely due to tactics such as kidnappings and drug dealing which eroded public support. And the FARC's failure must be understood within the brute repression by paramilitaries in collusion with the Colombian state and U.S. imperialism (Dudley 2006, 93).

However, the FARC was not alone in the idea of agrarian reform. Liberal Colombian governments have intermittently viewed land redistribution as a way to ameliorate rural conflict. Major government-led agrarian reform programs were established in the 1930s and 60s. Right wing reactions, in turn, subverted these programs in the interest of existing landholders. For example, President Pastrana (1970-1974) coordinated a national group of cattle ranchers (FEDEGAN), agribusiness executives, landlords, and urban industrialists to undo comprehensive lands reforms orchestrated by President Carlos Lleras Restrepo in 1961 under Law 135. The so-called 1972 "Chicoral Pact" group institutionalized rural land tax structures, while in exchange landowners were given favorable credit terms, loans, and protection from redistributive land reforms. Thus, ten years after the passage of Law 135, only about 1% of land identified for distribution had been expropriated.

Reforms and counter-reforms further concatenated the trajectories of 'two Colombias' that would strengthen FARC's popularity in a divested countryside. And so today, it is no surprise that October 2016's plebiscite vote split the electorate down the middle. The rural poor of 'second Colombia' voted for the peace accords; urban areas and major agribusiness departments of the 'first Colombia' overwhelmingly voted in opposition to the armistice.

The Land Question in Development Theory

The debate over land reform takes a particular form within international development theory. Exploring its basic contours provides context for both Colombian development trajectories and international science's conspicuous silence on the 'land question'. A window into these phenomena is through a longstanding and ongoing debate in development economics surrounding the relationship of farm size to productivity and rural economic growth. In 'labour-plentiful developing rural areas', empirical studies have demonstrated an inverse relationship (IR) between farm size and land productivity (Lipton 2009).[6] The IR is largely explained by transactional costs per unit production in developing countries, in which small, labor intensive farms can take advantage of family labor, informal relationships, aggregated, local knowledge, and adaptable systems. In developed countries with labor scarce, rural regions, the relationship is reversed and a direct relationship (DR) between farm size and productivity exists. In these scenarios, capital-oriented investments provide the highest returns. Small farms have advantages in managing labor, whereas large farms have advantages in managing

[6]The full debate regarding the existence of the inverse-relationship and its potential factors is wide-ranging, complex, and outside the scope of this paper. See Carter 1984, Chattapoadhyay and Sengupta 1997, Guarav and Mishra 2015 for a series of empirical studies at various scales and Bellemare 2012 on arguments *against* using the inverse relationship as a measure of peasant productivity.

capital. Counter-arguments generally identify market failures (sub-optimal use of labor), omitted variables such as soil properties (large farms are likely to cultivate larger percentages of suboptimal land), or measurement error (over-reporting of land size due to its relationship to prestige and political power) as main explanations for a perceived, yet false, increase in productivity on small farms (Bhalla and Roy 1998, Bellemare 2012).

However, in recent decades, major international development organizations such as the FAO and World Bank have avoided the IR-DR debate entirely, advocating for market-based land distribution. Whatever the effect of farm size or land reform on productivity, these ideas are irrelevant to the theory that unimpeded markets are the *causa sui* of optimum land allocation. To borrow the language from an FAO document published in 1997 tracing their own historical stance to land policy,

> The 1945 Quebec Conference that founded FAO stated: 'Recourse to land reform may be necessary to remove impediments resulting from an inadequate system of land tenure.' [By the] 1966 FAO World Conference on Land Reform the consensus [was] that land reforms were important [for] equity and economic growth in rural areas. [I]n 1979 FAO'[s first] World Conference on Agrarian Reform and Rural Development [produced a] plan of action [including] access to land, water, and other natural resources [with] people's participation. [However], land policies can only take shape as part of a larger economic and political canvas...agricultural polices during the 1970s and 1980s were mainly characterised by special agricultural programmes such as price controls, subsidised agricultural services and inputs, state intervention and regulations to protect domestic markets and *land immobility through agrarian reform regulations which intimidated investments*. The programmes proved to be unsustainable. Thus, we enter into the current period, following the collapse of the Berlin wall, with a return full circle to the marketplace to be the ultimate distributor of land (Herrera et al. 1997).

Taken at face value, neoliberal logics of land distribution should theoretically inform whether the inverse relationship between farm size and productivity holds true. That is, if small farms are more efficient at production, well-functioning land

markets should transfer land from the land-rich to the land-poor. The reality is opposite. Land markets are segmented and segregated throughout Latin America, and thus an exclusionary, two-tiered system of land transfers has flourished. Cadastral survey and titling promotes formal land market and capital accumulation for the land-rich, who further leverage their power to restrict transactional deals. Poor peasants meanwhile conduct informal transactions and are precariously susceptible to dispossession (Baranyi et al. 2004).

Neoliberalism has exacerbated this kind of land market. Within neoliberal theory, vestigial attempts at state-assisted reform (thwarted as they are in Colombia by the *latifundio* elites) are seen as an obstacle to the 'true' functioning of the market. The market, it is argued, will foster a more equal distribution of land (Lahiff et al. 2007). Among the policies considered damaging to market functioning are prohibitions on land rentals and sharecropping, limits on land sales, maximum size limits on land ownership, and price ceilings on land sales (Baranyi et al. 2004).

In practice, the World Bank's market-based policies, as they became implemented in Colombia, prove to have a disastrous effect on the rural poor. A 2004 report by the International Development Research Centre states that land sales by Latin America's peasantry are often "…distress sales, compelled by either excessive indebtedness or the lack of support for cooperative production (in the form of credit, technical assistance or market channels) under the new policy regime" (Baranyi et al. 2004). How, then, have recent market-based land reforms taken shape in Colombia?

Contemporary Colombia and the ZIDRES

Contemporary land reform attempts in Colombia have followed this neoliberal shift (Pereira and Fajardo 2015). With the embrace of World Bank pilot projects, a market-based strategy offers a minor role for state institutions and are aimed at high-performing, mid-sized entrepreneurial farmer. In the 1980s and 1990s the

government acquired Bank funds for "associations of production", aimed to create strategic alliances between large-scale farmers, small-scale peasants, and businessmen. Under the motto 'change in order to build peace' the government financed projects with a 'high probability of competitiveness' (Pastrana 1988). As Mondragon writes, "the government proposed a rural reform that would be completely dependent on a large central investment, creating as satellites small-scale producers in the 'alliance' system, a euphemism for their actual subordination." (Mondragon 2006).

Decades later, the same strategy for capitalist development persists in the ZIDRES program. In a 2016 speech to U.S. development experts concerning the peace process, Colombian President Santos claimed:

> We have half of Colombia still to conquer, in a way, like you conquered the West here in the United States in the 18th century, we have to conquer half of Colombia. We are one of the few countries who can produce more food, a lot more food, in the world (Oxfam 2016).

The ZIDRES (*Zonas de Interés de Desarrollo Rural Económico y Social*[7]) laws designate agricultural investment for farmer associations in regions with limited infrastructure and far removed from city centers. The ZIDRES claim titling '*tierras baldias'* ('vacant, unused lands') will stimulate development and reduce small farmer and agro-business conflict through shared business partnerships. Peasant groups including the FARC view the laws with skepticism, seeing 'partnerships' as a euphemism for continued peasant dispossession. For instance, the Altillanura, a vast tropical plain with acidic, weathered soils in the northeastern Colombia states of Meta and Vichada, is a focal point of ZIDRES. Brazil's state-owned agricultural research corporation, EMBRAPA, is advising Colombia on the adoption of

[7] The ZIDRES pertain to Decreto 1223, Ley 1776, passed in Colombian congress in 2016, see Colombian Ministry of Agriculture for full text: https://www.minagricultura.gov.co/Normatividad/Decretos/Decreto_1273_2016.pdf.

monoculture production in the Altillanura by transferring models from Brazil's conversion of the Cerrado into an expanse of grain. Due to its remote location and poor soils, the government touts large-scale investment as the only viable mode of rural development. This strategy overlooks subsistence growers and farmers who already live in the Altillanura but are unable to finance expansion (Alvarez et al. 2015). Foreign multinationals meanwhile circle as hawks above ZIDRES, enticed by the promise of larger land aggregations under formal ownership or lease agreements (USDA FAS 2015). Santos' rhetoric on rural agricultural development lays bare his interests – the production of commodities and raw materials, largely for animal proteins to meet rising demand in Indian and Chinese markets (Santos 2011). In total, the country seeks to rapidly open twenty-five million acres for agricultural development in the coming years.

Proponents of ZIDRES argue that legislation prohibiting land acquisition and ownership will prevent land accumulation. This is a dubious claim. The laws allow for long-term, renewable leases. Under novel forms of globalized agricultural capital, land ownership is often no longer required nor seen as desirable. Jan van der Ploeg's writings on the peasantry in the age of global economic and political Empire illuminate how, in a clear transition from classic hacienda models, land ownership is often viewed as unnecessary and risky. He writes: "Empire is a hit-and-run phenomenon. As soon as conditions for production and trafficking are better in some other place, Empire will move its 'roots', leaving behind only ecological destruction and a generalized impoverishment" (van der Ploeg 2008).

What emerges in Colombia is a formula for ongoing peasant disenfranchisement: forced expropriation of lands, deliberate exclusion from agrarian reform programs, and the steady deterioration of the social and material elements of the peasant economy. As Mondragon writes,

> Campesinos no longer face only landowners as employers, but now must deal with a range of other forces as they compete directly as entrepreneurs in the global market. Such a market, and its "globalization" model, seeks to "clean" territories of "inefficient" people. While elsewhere this happens

> as a result of so-called Darwininan economic competition, in Colombia it is being attempted through war." (Mondragon 2006).

Such is the contemporary strategy of capitalist development co-authored by Colombian and transnational elites. It flows out of the dominant historical currents in favor of wealthier peasants and agri-business. What, then, is the contribution of international institutions that claim, similarly to the Colombian FARC guerrillas, to represent the rural poor?

CGIAR/CIAT: Landless Science

In the thick of civil war, in 1967, the International Center for Tropical Agriculture entered the realm of Colombian agriculture. CIAT was an early member institution of the CGIAR (Consultative Group on International Agriculture Research), a global umbrella organization with 15 stations around the world whose mission is to apply modern scientific methods to the complexities of smallholder tropical agriculture. Its establishment marked the beginning of a new type of development strategy, organized into an expansive array of programs that claimed, as Cullather writes, "guardianship over the 40 percent of the developing world living in 'absolute poverty" (Cullather 2010, 238). CGIAR funding came from the Rockefeller and Ford Foundations and later joined the ambit of the UN and World Bank. Through the CG system, the World Bank sought to construct an alternative development praxis that would largely bypass national governments to focus on small entrepreneurial farmers. Designed to institutionalize early Green Revolution crop development advances, the CGIAR system was directly linked to broader geo-political aims to quell the global rise of rural Communist political movements (Cullather 2010, 7).

From the outset, CGIAR research focused on industrialization and inclusion of lower peasants into global markets. Yet these technological and economic levers did little to address fundamental production constraints in areas with unequal land distribution (Lipton 2009, 118). Nowadays, CIAT's strategy is to increase yields

while reducing ecological degradation of soils and forests. Their methods include farm management trials, econometric analyses, and crop breeding under the catchphrase "increasing eco-efficiency of agriculture for the poor" (CIAT 2012).

To take a closer look at the place of land in international agricultural research, we analyzed policy documents published by the CGIAR and CIAT. Given the bloody history of land, we wondered whether CGIAR science demonstrates any concern over land distribution in last decade. We derived keywords from an initial review of policy documents, cataloguing the most frequently appearing terms (see *table 1*). We analyzed 5 CGIAR strategic plan documents, 9 CIAT policy briefs, and 4 CIAT program development documents. We used these terms to delineate main categories of CGIAR and CIAT research: environment, poverty/hunger, markets, gender, genetics, and land.

Categories	Search Terms
poverty/hunger	poverty, hunger, nutrition, food security
environment	climate, ecosystem services, natural resources, conservation, sustainable, resilience environmental degradation
markets/productivity	markets, opportunities, income, (economic) growth, productivity
genetics	gene, genetics, breeding
Land (no link to reform or distribution)	*Land designation determined by context of article, dominant association (e.g. landscape, land degradation)
Land (link to reform or distribution)	* Land designation determined by context of article, dominant association (e.g. land inequality, land reform)

Table 1: Categories for document analysis and component search terms derived from review of CGIAR and CIAT policy documents.

Preliminary results demonstrate abject lack of research and directives on land distribution and land conflict in the CGIAR system. Across both organizations, land reform/redistribution is < 1% of search term results. Of the five CGIAR documents, land inequality is never identified as a focus point. A single CIAT policy brief from February 2013, "Bridging the Urban-Rural Gap in Colombia" comprises 13 of the 18 total references to land distribution. In comparison, poverty/hunger, markets/productivity, and environment are mentioned 482, 540, and 610 times, respectively.

Although both CIAT and the CG broadly maintain a conspicuous silence on the land question, one of the CG centers, the International Food Policy Research Institute (IFPRI) does give the topic some attention. Specifically, it aims to support market-based land reform for farmers to ensure supportive linkages between market-based food security and land tenure, as well as fostering global South-South collaboration for sustained growth. Rural areas are perceived as a potential space for entrepreneurial development if international assistance is coupled with pro-growth trade policies. Gender equality is framed as the inclusion of women into market-oriented production. As a 2010 IFPRI policy brief states,

Latin America can learn lessons from Asia's experience in smallholder land reform, investment in infrastructure and agriculture, and regional trade [...] Asia, in turn, can learn from Latin America's experience with opening up trade within and beyond the region, privatizing public services, and improving access to markets for high-value agricultural products […] Asia, with its rapid economic expansion, population growth, and poverty levels, is generating huge demand for food and intense pressure on land and water […] Latin America's agricultural capacity and export orientation makes it a natural partner in trade as well as learning. Both regions can gain from each other. (IFPRI 2010)

In the rare case that reform makes a splash in CG policy and research, subsistence production, land conflict, political struggle, and gendered dynamics of accumulation are conspicuously absent. The obvious conclusion then is that neither economists' support of land reform according to the logics of the inverse productivity relationship, nor early State approaches for resolving conflict over land have been aligned with radical goals of communist revolution or militant opposition to the State as espoused by the FARC. Rather they viewed land reform as a central engine of capitalist growth. But thus, it is doubly surprising that international research stations such as CIAT neglected (and continue to neglect) to study land reform or situate their research around the land question. While it would be quite unexpected to witness these institutions approaching the land question from an anti-capitalist, revolutionary lens, it is even more shocking that

capitalist development approaches to land reform are equally absent from research agendas.

Landless Agricultural Science: Development's Underbelly

Having demonstrated an abject silence on land, one could criticize CGIAR science from a Keynesian lens that argues in favor of progressive land redistribution. Instead, we isolate a more incisive question: What does silence on land reveal about the relationship between science and capitalist development in Colombia? Antonio Gramsci's thoughts on science are helpful here. He argues that science is, at its most elementary, the process by which humans form and refine their "conceptions of the world" (Gramsci 1976, p. 34); and furthermore, that "Scientific experiment is the first cell of the new method of production, of the new form of active union of man and nature" (Gramsci 1976, p. 446). What kinds of conceptions does CGIAR science produce, and what form of capitalist development is CIAT attempting to seed?

We argue that CGIAR science serves precisely to relieve the contradictions of rural Colombia *without* addressing land. In other words, CGIAR science is a subordinate component of broad development strategies that is designed to contain development's inevitable social fallout–dispossession, landlessness, and precarious rural economies. This is accomplished by emphasizing the integration of lower peasants into global agro-commodity markets using new technologies of land use. While it is true that new technologies can lower transactional costs of agricultural production, it is crucial to recognize that the strategy is spatially constrained to the marginalized patches of land onto which rural violence and displacement has reduced lower peasants. Markets and technology do the work of resolving poverty *in situ*. CGIAR centers perform experiments upon this 'landless strategy' and create ideological justification (papers, reports, conferences) for its broader reproduction. And so, a conception of the world is formed in the minds of scientists, a conception in which land is subtracted from the calculus of how to

advance the interests of the rural poor. Globalized land grabbing and extreme rural poverty cohabitate the land, apparently in harmony.

In James Brittain's overview of American development intervention in Colombia, he describes the unique role played by academic economists, providing a screen of 'plausible deniability' for the ruling class, government, and international elite (Brittain 2005, 336). Technocratic, politically neutral, and outside advice is used by standing governments to justify coercive policies or deny alternative visions. Scientific information regarding economic models and development trajectories, which is presented as empirical and politically 'neutral', can then be used to shield highly interested decisions about land management and titling, tax structures, and loan packages. Modernist World Bank advisers avoided the specifics of revolutionary struggle and land reforms made by the FARC, focusing instead on the involvement of peasants in the urban industrial sector to alleviate the socio-economic plight of rural poor (Thomson 2011). This form of technocratic logic justified the displacement of peasant class, obscuring the violent procedures necessary to achieve these goals. Economic theory made large-scale and export-oriented agriculture 'legible' (Scott 1998), providing ideological justification for the violent expulsion of peasants at the hands of state warfare, paramilitary organizations, and transnational economic policies.

We argue, that, to its peril, the CG system operates in the same vein. The CG centers provide scientific evidence that is financed by high-profile, global funding networks, and mobilized by transnational research networks and a visible scientific elite. Thus, certain development agronomy approaches, such as 'Climate Smart Agriculture', market chain integration, and the inclusion of women into commodity production gain precedence and visibility, while others, such as land reform, agroecological social movements, and subsistence production do not. National, regional, and local governments can point to CGIAR research as evidence to support continued capitalist development trajectories for rural Latin America (Minagricultura 2016).

Backers of the ZIDRES laws in the Santos administration can highlight the potential for improved marketization of agricultural products as a desirable outcome for Colombia, drawing support from the intellectual contributions of the development agronomy apparatus. In 2011, Santos announced a strategic partnership between CORPOICA (Corporación Colombiana de Investigación Agropecuaria) and CIAT, with technical assistance from EMBRAPA. While a quick acknowledgment is given to the importance of including smallholders in Altillanura development, the role of technical science is one of production – improved genetics, new seed varieties, soil amendments, and climate change adaptation for large-scale landscape transformation (Santos 2011). Under the guise of innovation and international agricultural science, the State and the multinational business interests it beckons are then freer to pursue policies that ignore peasant demands.

It is plausible to propose a strategic connection between CGIAR science and capitalist development among the chief architects of its agenda, which is comprised of a small circle of elites including leaders of transnational agribusiness and billionaire philanthropy. Land is not on their agenda, for good reason. But this leaves us wondering, how does that agenda travel down the chain of command to the mid-level intellectuals who produce CIAT reports? How could these intelligent minds ignore the centerpiece of rural violence in their country? Scientists at CIAT are comprised of upper-middle class Colombians and visiting academic researchers from around the world, many who have long-term relations in-country (author observation). One explanation is that scientists who are most often selected from urban middle and upper classes, have little conception of land struggle and rural conflict. Further, land reform has been excluded from the intellectual formation of scientists since the post-War heyday of Keynesianism. Or, perhaps scientists' silence is due to repression: the politics of land reform have been violently suppressed in Colombia, while the demands on the scientific proletariat to fulfill one's landless research agenda keeps minds in line with the binding bureaucracy of big science. Project demands are endless while the stickiness of land reform and local and regional political structures inconvenience the rollout of development projects (Mosse 2005). Both explanations are plausible.

Meanwhile, the CGIAR system is changing in macro-structural ways. In the face of diminishing government support, it pursues public-private partnerships. This further diminishes the possibilities of science serving interests outside the realm of capital, and reproduces linkages between scientific exploration and capitalist development. There is renewed focus on the smallholder farmer, who is seen as a future entrepreneur who can be removed from subsistence through the right mix of access to superior plant genetics, market chains, and soil management. Land is ominously absent, although it can now be 'salvaged' through limited tillage and cover cropping.

In this instance, CIAT is a self-contained irony: an elite cadre of international scientists working in a gated commune amidst vast sugar cane plantations on fertile soils of Valle del Cauca; scientists who are tasked with resolving the misery of the rural poor thousands of miles away. Only a decade before CIAT's founding, World Bank advisers to the Colombian government had advocated the forced removal of peasants from the valley, as their presence impeded development plans (Brittain 2005).

Can The Left Respond?

In the wake of the Colombian peace treaty, rural Colombia is at a crossroads. Santos' vision for the peace accords is directly intertwined with the expansion of rural agribusiness, creating the likelihood of islands of rural FARC settlements in a sea of palm oil and soya export agriculture (Hylton 2017). An uptick in extrajudicial killings of rural social movement leaders exposes the precariousness of the peace agreement, drawing parallels to the massacre of Union Patriotica leaders in the 1980s, as FARC entered national politics in what became an unsuccessful peace accord (Telesur 2017, Dudley 2006). Will rural and urban Left organizations successfully transform the momentum from the peace accords into anti-racist, anti-capitalist political platforms based on wealth redistribution and increased equality of land, education, and employment? How will international development and

scientific institutions respond and what political trajectories will they implicitly or explicitly support?

Meanwhile, the continued withering of public support for science and the international rise and powerful consolidation of hetero-patriarchical, economic nationalist agendas in the U.S. and Europe is attempting to change the nature of scientific institutions. This is not to say that research institutions were immune to the agendas of corporatization and national defense before the recent political conjuncture. As we stated previously, the CGIAR legacy has always been one of geo-political control and defining the contours of capitalist development. But, is CG's ongoing silence on land questions a *feature* of capitalist development? Does it act covertly to depoliticize development? Or is it a more complex outcome of generations (or centuries, rather) of disembodied science? As the influence of integrated ecology and in-situ breeding gains *some* leverage in the CG system, the absence of research on land distribution and its effects upon rural well-being and agroecological adoption is increasingly untenable. It seems unlikely that the CG will resolve these contradictions to address rural inequality as it shifts its strategies to the latest entrepreneurial fads in public-private development in a constant struggle for funding.

When the political agenda is set squarely against scientific inquiry, does the possibility exist of transforming the resultant disillusionment and discontent among mid-level scientists into more radical social movement work? What tools do mid-level scientists currently have at their disposal? How can a CGIAR scientist immediately put to use genetic material, intellectually engaged and skilled peers, and legions of data to enact mass democratic futures? Can they? Are there possibilities for a reorientation of a 'science for the people'? If there is any hope of organizing sustained change and reorienting science to support peasant struggle from within the CGIAR system, we believe that land conflict must be placed squarely in the center of scientists' conception of the world.

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GISELLE VILA BENITES[1]

IWRM and the legacies of large-scale agriculture in the Peruvian Amazon[2]

Agribusiness in Latin America have expanded noticeably during the last couple of decades. By 2014, the LAC region held a 13% share of the world trade in agriculture, 5% more than the share held in the mid 1990's (Chaherli & Nash, 2014). As this growth translated into economic benefits for shareholders, it also accounted for 70% of the deforestation in LAC between 2000 – 2010 (FAO, 2016) and led to increasing conflicts with local based economies dependent on small scale agriculture (Deere & Royce, 2009). Among the efforts to halt these negative impacts new models of resource governance emerged aiming at integrating stakeholders and users into accountable organisations.

Integrated water resources management (IWRM) is framed under this rationale. Following the worldwide accepted definition provided by the Global Water Partnership (2009), "IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems". This approach was thought to face the now outdated paradigm of managing water according to different sectoral

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needs. Water scarcity, competing uses and economic growth compelled water decision makers to think in a coordinated manner (Allouche, 2016).

In practice, however, IWRM has been found as a vague nirvana discourse (Molle, 2008) and a highly contingent approach (Mehta et al, 2016) that still holds certain sectors (for example, agriculture) as central in decision making. Evidence points out to the local governance arrangements that resist the imposition of IWRM models (Jones, 2015) whereas through its absolute rejection or through the subtle imbrication of governance logics (Sehring, 2009). These findings have been comprised under the lenses of institutional bricolage (Cleaver, 2012) and policy translation (Mukhtarov 2014). In these literature water is not managed as an isolated resource, rather, it is understood as an embedded fluid in social relationships, such as kinship, that is connected to other nature beings, such as land and forest.

This article reviews the attempt to impose IWRM over the water governance arrangements of a native community in the Peruvian Amazon that faces an increasing intervention of rice agribusiness in their lands. The resulting dynamic can be understood as an *altered* arrangement: it doesn't lead to the creation of an IWRM institution, nor does it reject new governance architectures. The rescaling of water governance, the interpretation of IWRM meanings and the contingency of the results, all within the frame of a history of agricultural development interventions in indigenous lands, helps us understand this phenomenon.

Translation and Bricolage

The differences between the proposed policy outputs and the real outcomes have been addressed under the policy translation analysis, which proposes that policies rarely remain unchanged when they travel across different scales, jurisdictions and social groups (Mukhtarov, 2014). Focusing on the everyday actions of the social groups that experience those changes, the institutional bricolage concept sustains

that the new arrangements are highly dependent on previous ones, including social organization, cosmologies and, in general, the "right to do things that people find unquestionable" (Cleaver, 2012: 65). Under this understanding, institutions are in constant transformation and the results do not exclusively depend on the participants control, rather, they are understood as a tension between agency and structure (Benouniche et al, 2014; Sehring, 2009).

Institutional bricolage is a pivotal dynamic in the actualization and renovation of institutions. It is the adaptive process through which repertoires (rules, traditions and social relations), from already existent institutional arrangements are drawn to answer new circumstances (Cleaver & De Koning, 2015; Cleaver, 2012,). These arrangements include moral – ecological rationale that link natural and supernatural worlds to shape rules of coexistence, conflict management and authority principles (Boelens, 2008). As these arrangements come from existing formulae, they legitimate the new shapes they take when mixed and adapted to new circumstances. For example, the elders counsel in Nkayi (Zimbawe) becomes a communal assembly to allocate water rights (Cleaver, 2012), or the assembly of a peasant organization in Peru is adapted to create a water users' association (Verzijl & Dominguez, 2015).

The policy transfer literature has highlighted three dimensions in the process of creating new meanings. First, the politics of scale, which refers to the actors' mobility through different hierarchies but also to their ability to produce them and frame their discourses accordingly (Budds and Hinojosa, 2012). Second, the creation of meanings, which highlights the role of ideology, symbols and identity in the transformation of policy ideas (Gerlak & Mukhtarov, 2015). Finally, the contingency of results, which sustains that alteration is not only a possibility but an inherent attribute of any policy translation process (Mukhtarov, 2014). The three dimensions will be reviewed for this case.

The Case of the Bajo Naranjillo Water Users Association (BN-WUA)

Peru entered the 2000's aiming at renewing democracy and bringing after the fall of a highly corrupted government. Aiming to enact a new Water Law that highlighted accountability and collaboration, the government invigorated its relationships with international cooperation agencies, such as GTZ[3] and FAO, water authorities from different countries and other institutions, seeking counsel about water management from a multisectoral and integrated perspective (Oré & Rap, 2009). As a result, in 2003 the Water Intendency[4] presented the National Policy and Strategy of Irrigation, a document that regarded water as an economic resource which could be managed with *efficiency, equity, and sustainability* from an integral and multisectoral approach (Oré & Rap, 2009: 54), presenting for the first time some of the principles of IWRM.

The Bajo Naranjillo Water Users Association (BN-WUA) was created in 2004 amidst this juncture. It manages the Bajo Naranjillo sub-basin, one of the 13 tributaries of the Alto Mayo Basin -which covers 7400 km2, an area known for its rice, coffee and cacao crops. Its creation was important because it was aimed to settle a successful experience with the new water governance model and also because it was the first water user association in the Peruvian Amazon. The challenge was particularly difficult because it had to integrate the needs and interests of different ethnic groups: awajún[5], wampis and settlers - known as *mestizos*The Native Community of Bajo Naranjillo was created in 1975. The community has fulfilled a crucial role in the economy and the politics of the Alto Mayo Valley (Brown,

[3] Currently known as GIZ – German Cooperation Agency.

[4] The Water Intendency depended from the Ministry of Agriculture. With the enactment of the new Water Law in 2009, the Water Intendency was reshaped as the National Water Authority, although still ascribed to the Ministry of Agriculture (now named Ministry of Agriculture and Irrigation).

[5] Formerly known as "aguaruna".

2014). Here the Aguaruna Organization of Alto Mayo (OAAM)[6] was founded in the 70's, an organisation that promoted the political debate to improve indigenous lives. Bajo Naranjillo has also been known for its extensive rice crops and was, for a time, the place to settle rice trade with rice companies, as the result of development projects conducted by the State and development agencies to promote large-scale agriculture and credits (Works, 1984).

This became a tragic economic process for the Bajo Naranjillo community, as we will see in the next section, and became one of the reasons why the creation of the water users' association and the associated water tariff was a contested process. Nowadays, the awajún and wampi of Bajo Naranjillo depend on large-scale agriculture to live, but none of them work the land or sell the crops. They are now part of a complicated production chain that has led to the alienation of water rights.

Rescaling BN-WUA

The IWRM approach understood the basin as the management unit. Therefore, it involved organising the users along it. This meant that the awajun and wampi people, who had been allocating water permits among each other under a kinship criteria[7], had now to coordinate with the *mestizo* group as they were basin neighbours. The IWRM promoters[8] saw this as an accomplishment, for they had gathered all the users along the watershed to coordinate decisions on water allocation. But little they knew about the land use conflicts between the m*estizos* and the indigenous groups.

[6] Today known as FERIAAM – Regional Federation of the Awajun of Alto Mayo.

[7] The elder family clans took the first water shifts. Under the new regime, the proximity to the water canals defined the shifts.

[8] The Local Water authority (Rioja ATDR), GTZ, San Martin Regional Government and the Ministry of Agriculture.

In 1981, the Peruvian government launched PEAM – Alto Mayo Special Project, one of the most important agricultural developments for the Amazon which had the objective to increase agricultural productivity and rise income levels for 12 800 families (Ocampo, 1994). To meet the challenge, PEAM granted 3 800 agricultural credits through the Agrarian Bank. Due to these efforts, by 1982 rice crops in Bajo Naranjillo increased four times more than in the previous year and at a faster pace than in other native communities -a phenomena credited to the existence of OAAM in Bajo Naranjillo.

Albeit this growth, the awajún were not capable of meeting future crop expectations. They failed to become experts in large scale agriculture because PEAM targeted men in order to train them as farmers and entreperneurs, while in awajun culture women are the ones responsible of the things that grow under a careful understanding of the links of *yumi* (water) and *nugkui* (land). Also, the awajún faced labor shortage to conduct a coordinated cropping dynamic. To pay the increasing debt they acquired with the Agrarian Bank, the awajún chose to rent their lands to the *mestizos*.

When the *mestizos* came, most of them complied with the awajún way to do things, nevertheless, a short time later they stopped abiding by the awajún law. They even stopped paying for the rented land because this was an informal arrangement. They refused to leave, forming families with the awajún daughters. Several years of trials and agreements followed and the animosity between both groups strengthened.

But as part of the BN-WUA, awajún, wampi and mestizos had now to collaborate with each other. As the sub-basin crossed indigenous entitled land, the awajun and wampi held the first water shifts. The shifts were deemed as *safe* because they were shared between family members who had neighboring lands along the Bajo Naranjillo river and the water canal. This allowed them to find an opportunity to use the WUA creation process to negotiate with the mestizos the abandonment of indigenous lands, threatening to cut their access to water. Moreover, they used this position to stop marriages between indigenous women and *mestizos*, in order to secure family heritage and land tenure. The discussion process was harsh but

the *mestizos* eventually agreed. Water control offered the political grounds to define the allocation of other goods on the basis of social relationships.

While kinship defined the social limits to access water before, the scale was redefined with the arrival of IWRM principles. The community boundaries where readapted to the sub-basin scale to deal with a long-term problem. Here the architecture of the State, with the WUA, was adapted to the moral-ecological rationale of kinship to redefine the scale of indigenous lands. However, it did not lead to the incorporation of the sub-basin as the new management unit, as suggested by the international experience. Rather, it reshaped indigenous peoples' boundaries and rescaled the range of land governance. IWRM then was assumed as an arena to deal with pre-existent conflicts. To do this, IWRM had to be alienated from its original transnationally-defined meaning.

Redefining IWRM: Water Meanings

One morning during the summer of 2003, a GIZ consultant[9] visited the awajún and wampi people to explain how IWRM principles lay the grounds for modern WUAs. He summarized his views asserting that water management should be efficient and sustainable if water is to be *delivered* to everyone. Noe Cahuaza[10], leader of one of the older families of Bajo Naranjillo, felt uneasy with these terms. He remembers that during the meeting "efficiency" was defined as paying the right price for the water you need, avoiding wasting it. He did not follow. "Why paying for something that runs free? why water has to be delivered? It comes when it wants to come". Noe would find out three years later the consequences of his refusal to pay.

[9] Ing. Jorge Gonzales, now a consultant of the Alto Mayo Basin Organization. Interview held on January 12, 2014.
[10] Interview on February 1, 2014.

In 2006, the BN-WUA was enforced to pay for water by the local water authority, claiming that they were not abiding by the law.[11] Although the awajun and wampi people have entered into the dynamics of a market economy, the economic transactions with each other are limited. There is a reciprocity bond, a chain of favors, which characterizes the support among clans. Charging each other for water threatened that bond. This link refers to an extended version of kinship. "Awajun" derives from the world "awap", which is translated as "friend" and "brother". As one of the oldest woman in Bajo Naranjillo argued, "in a way, we are all one family and family does not charge to its members, you do what you have to do without expecting payment". Under this logic, a payment could even be considered as an insult to the individual that freely and disinterestedly helped his brother.

On the other hand, the very nature of water was under question. According to the awajún and wampi cosmologies, *yumi*, or water, is understood as an entity with emotions that is characterized for connecting heaven, earth and the underworld; men and women; life and dead; humans and the forest, among other dualities (Brown, 2014; Reagan, 2003). A person cannot claim ownership over *yumi*, least charge for accessing it, because it has free will and intentions. *Yumi* is respected also as part of the extended kinship logic, as it is regarded as "one of the oldest relatives we have that goes in and out of the forests", thus *Yumi* has agency because it not only reacts as part of the natural world, but could act according to kin.

The awajun and wampi were also dubious about the type of "development" presented by the IWRM promoters. Their previous experiences with development projects did not end well. After the dramatic experience with PEAM in the 1980's which led to an economic crisis, in the 1990's at least 21 development projects were conducted by NGOs, the government and international cooperation. Some of these organizations proposed conflicting resource use arrangements. This led many

[11] A percentage of the water tariff goes to the government. Thus, the BN-WUA was not paying its "water taxes", as one of the former awajun leaders says.

awajún and wampi to render development as a sheer adjective that came with any type of project. By the end of the 1990's Bajo Naranjillo installed a projects committee, devoted to assessing the suitability of any development project that knocked their doors. Slowly, they became expert "projectologists"[12] and learnt how to get investment from the government in the shape of development projects. They praise themselves as the first "developed" community in Peru, while laughing.

Albeit their mistrust with "efficiency" and "development", the awajun and wampi agreed to create a water tariff to remain in "the government's good records", as the now president of BN-WUA said, to keep receiving their investment. However, to accept the government's procedures does not imply a commitment with the values it portrays. The compliance with the water tariff, then, is not linked to the acceptance of the IWRM principles but to a conflicted history of interactions with the government, with the experience of development, and a reflection on indigenous values about water and how to relate with each other. Thus, the principles of efficiency and sustainability are rarely part of the awajún and wampi vocabulary, although frequently quoted in their projects.

Because, although the water tariff was created, the awajun and wamps did not pay for it, as will be explained in the next section.

On the Contingency of Results

The entitled lands of the awajun and wampi are known for their rice and coffee crops. They, however, do not harvest nor commercialize rice by themselves, because they offer their lands for rent. Given their critical failure with modern agriculture, they decided to stop farming and start renting, looking for quick getaways from the debt they had fallen into. With time, renting land proved to be an income-making

[12] "Proyectólogos" in Spanish.

activity with short-term returns. The creation of the BN-WUA was useful to claim back their lands and secure them. From 2005 until 2010, land renting was safe.

After the enactment of the new water law in 2009, a renewed interest was given to the creation of river basin counsels, to further the advancement of IWRM and include all users in decision-making. In 2010 the news arrived to San Martin, saying that Alto Mayo would be among the firsts to create a basin counsel in the Amazon. Invitations were sent to all stakeholders: farmers, rice companies, municipalities, NGOs, international cooperation agencies. An invitation came to the BN-WUA, attaching a list of all their members. They noticed that instead of the names of awajun and wampi families, the list presented the names of rice companies as water users. Since that day, the relationships within BN-WUA changed.

To get rid of the water tariff problem, the awajun and wampis decided to charge the payment to their tenants, who were deemed as responsible for being up to date in the local water authority books. As their tenants were individuals who represented rice companies, the water tariff's receipts had the name of one of Alto Mayo's richest companies: Induamerica. According to the water law, only those that are up to date with the water tariff payment are entitled to be called water users. As such, those are the ones invited to the decision-making processes.

Although the Bajo Naranjillo sub-basin crosses the awajun and wampi's entitled land, they are not acknowledged as water users. The *mestizos* seized the opportunity to reclaim control over the WUA, ignoring indigenous hierarchies, and control the WUA in coordination with the rice companies, who also appointed a representative. Up until 2014, the awajun and wampi fought to regain representation. Only in 2014, the National Water Authority gave them permission to participate in the discussion of the Alto Mayo Basin Counsel, but only as observers.

Under the eyes of the National Water Authority, Bajo Naranjillo is a successful case of *enforcing* IWRM principles in practice, having gathered farmers and private

companies in decision-making. The evidence, however, shows that beneath the formal water governance architecture deep inequalities become salient. The imperviousness of the law towards understanding indigenous water use rationale ends up obliterating any claim IWRM principles could have concerning equity.

Conclusions: Altered Arrangements

What does IWRM mean for the awajun and wampi in the Peruvian Amazon? For a moment, an opportunity for indigenous groups to control *mestizo*s activities and secure land tenure. The WUA, nevertheless, was not rendered as an operative representation of the IWRM principles. More likely, it was handled as the arena that could be shaped to serve the awajun and wampi needs. In this case, the translation across scales ended as a rescaling process to address specific needs.

Later the BN-WUA turned into a threat for indigenous people, as they were cleared from the decision-making instances. The *mestizo* group placed itself as the new directing body and used the WUA to contain indigenous actions to reclaim their control. Albeit the change in the governing body, the WUA keeps serving its original purpose: to provide a political arena where conflicted actors try to exert their dominance in the final outcomes. Little does this have to do with the IWRM principles of sustainability and efficiency that government officials expected to enhance.

Large-scale agriculture has a critical impact in this history. Even if indigenous people failed to incorporate the logic of the agribusiness to work their lands, the practice was entrenched through the axis of debt. The imposition of the IWRM model is understood only reflecting on this background, a model thought to maximize the utilities of rice in the Alto Mayo Valley. This logic questions the intersectoral nature that IWRM should have. Other uses different from irrigation for agriculture were not under question during the IWRM implementation, a process that reflects on the nature of the National Water Authority today: still

under the umbrella of the Ministry of Agriculture and Irrigation, besides its call to coordinate with all the sectors.

The resultant governance architecture, then, does not truly include the IWRM principles. The WUA is accepted only as it counterfeits and solves local power struggles. In this way, local stakeholders' rationales are interwoven with national frameworks to outline a new kind of organization. Reflecting on De Koning (2011), the WUA presents the characteristics of an altered arrangement, as it incorporates external constructions to nest unchanged local dynamics, logics and meanings. Altered arrangements are the result of readjustments rather than of the full incorporation of new institutional logics.

The changing trajectory of the BN-WUA demonstrates the way national level policies land over local realities and the dangers this may present when not properly addressing local histories, power relations and cosmologies. The final outcomes of the translation process could not be further from how IWRM is ideally proposed: inequality in access becomes legitimate, an important group is alienated from decision-making and no one truly believes in the promises of development.

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A LKE JENSS[1]

Control, Utility and Formalization at the "Frontier": Contested Discourses on Agriculture in Eastern Colombia[2]

Small-scale farming still plays a major role for Colombia's urban food markets (UNDP 2011). Unlike in many Latin American countries, small-scale farming is still decisive for supplying urban dwellers with their everyday fare. Yet, this is about to change. Parallel to the government - FARC peace deal, a bundle of agricultural policies aim at transforming the Eastern Colombian region of Altillanura, and with it, agrarian production. Media and government sources during the last years have taken turns in arguing for an expansion of what they call Colombia's "last grand agrarian frontier" (DNP 2011: 4). This government and corporate discourse derives from a "commodity consensus" (Svampa 2015) which appears almost hegemonic - until we begin analysing grassroots documents. On the contrary, the transformation of the Altillanura has been one of the most contested political projects in Colombia in the past years.

The economies of dispossession and land appropriation incited by a continuously extractive model in Colombia are well known by now (i.e. Ballvé 2012; Grajales 2011). However current efforts are no longer aimed at direct appropriation but rather at formalization and land control. At the same time, the Altillanura has rarely

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been the focus of academic research. This essay aims to disentangle competing discourses around the current project of agro-industrial restructuring and to identify how discourses of "frontier" and underutilization, land tenure formalization and bioeconomy[3] tend to legitimize significant changes in land control in the Altillanura – changes that benefit some in detriment of others.

The Altillanura region is predominantly rural with small urban nodes dotting the Eastern plains. Agriculture in the region increasingly focuses on palm oil production and monoculture. Capital intensive technological input is often necessary to make this type of agriculture productive. Self-identifying indigenous communities make up 30 % of the population (DNP 2011: 10).

Land control as a core concept is understood here as "practices that fix or consolidate forms of access, claiming, and exclusion" (Peluso and Lund 2011:668). This concept focuses on how agents "hold on to the land" (ibid.: 669). It is linked to enclosures, a second important notion here (see Backhouse 2015). Enclosure entails claims over land perceived as legitimate, requiring "decision-making powers, ability to draw boundaries around objects within the boundaries", which Peluso and Lund (2011:673) understand as territorialization. The latter is part of the fixation of access to land.

This analysis draws from a variety of documents. Discourse analysis is based on government planning documents, national print media and corporate press releases. To exemplify grassroots discursive interventions which are not as visible in national media, I cite from a range of different publications such as press releases. The essay also draws on interviews held between 2011 and 2012 which serve as background information. The remainder of the text is structured according to the key terms around which discursive interventions are grouped (frontier, underutilization,

[3] This is not to claim that all participating agents use these terms explicitly, yet they constitute key elements in public discourse.

formalization, bioeconomy) to expose poignant discourses, sub-elements and counterdiscursive strategies.

Modernization Attempts and Expansions into the "Last Frontier"

In recent years, investors' focus has shifted from the Bogotá-Medellín-Cali urban triangle to a new economic region. The Altillanura has appeared on maps and charts of investment opportunities as the "last agrarian frontier" (DNP 2011: 4; Contexto Ganadero 2014; Restrepo 2010). Yet, Colombian imaginaries of the "frontier" expose their own contradictions. On the one hand, the Altillanura is in part constructed as a territory outside the reach of the state, on the border, to be colonized and incorporated into state territory. On the other, a static image of the state territory as a given is at the base of Colombian official discourse. In fact, discursively, the Altillanura has also repeatedly been brought to the centre of the official post-conflict imagery of the country.

These representations are continually contested: The counterpart to the "frontier" discourse associated to a necessity of economies of scale (Oxfam 2013: 10) is a reality of contested spaces. Resistance emerges in these counterhegemonic discourses, fearing the Altillanura might function as an 'agricultural enclave' (Arias 2013: 1). Even though violence appears as a thing of the past in government and corporate discourses on the "frontier" (see Poligrow website, Semana 2012), the frontier space is one of physical violence. Colombian union representatives and social organizations have demanded investigation on selective murders and the possible corporate responsibility. The "systematic violation of constitutionally guaranteed trade union rights", the firing of union-organized workers or military observation and harassment are only some of the allegations against different companies in the region (Congreso de los Pueblos 2013: 1).

Grassroots organizations of small-scale farmers, indigenous and afro-Colombian movements have formulated counter-discursive strategies to the notion of frontier,

to defend what they see as tierra and territorio (land and territory). Their discursive use of "frontier" space is limited. In their understanding, tierra as a means of production to be defended is linked to territorio which refers to a collective identity connected to the land, as a concept which encompasses cultural and commemorative elements and community institutions (ONIC 2011). A different form of territorialisation takes place here. These social movements have increasingly insisted on territory as a defining feature of their identity (Bonilla 2011; Baquero Melo 2014). Their political strategies are place-based (estrategias-basadas-en-lugar), yet also transnationalized, as the example of Via Campesina shows (Escobar 2008: 49). While historically territorios with autonomous political administration by campesinos have existed, (i.e. Palenque or Sumapaz), now communities such as the U'wa formulate communal "Planes de Vida" and claim collective economic management, planning and cultivation as well as democratic processes of decision in territorios and Zonas de Reserva Campesina which they demand be excepted from the agro-industrial model (see Cabildo Indígena del Pueblo U'wa de Tamara, Sácama y Hato Corozal 2014). The Colombian Constitution is remarkably progressive on rights to land. Indigenous rights are codified in the constitution (1991) and on a global scale by ILO-Convention 169 (1989) and the UN Declaration on Rights of Indigenous Peoples (2007), establishing, among others, the principle of prior and informed consent. Theoretically, land rights are at the centre of the Victims and Land Restitution Law on Displaced People (No. 1448/2011) as well as in environmental protection norms and regulations such as the Decree 1745/1995. The 1745/1995 Decree, for example, established special assessments for projects planned on land with claims of collective land titles (Baquero Melo 2014: 339 ff.). Yet, the "frontier"-discourse also exposes the uneasiness in which competing ideas about land play out in the colonial relation between the 'modern' state and indigenous organizations.

The planning of Rural, Economic and Social Development Interest Zones (Zonas de Interés Rural, Económico y Social, ZIDRES) and the presentation of the Altillanura as a scarcely populated "agrarian frontier" are intimately linked (Las2Orillas 2016). ZIDRES are special economic zones supposed to "modernize"

agricultural production and make it more efficient in the Eastern plains. They are presented as a frontier instrument, facilitating development at an imagined agricultural frontier through extraordinary regulation (Presidencia 2016). The legal package accompanying the establishment of ZIDRES condenses current constellations of forces into (still uneven) state policies at municipal, province and national scales.

Grassroots organizations opposing the government discourse argue that this official vision for the "frontier" will lead to an even aggravated concentration of land control (Álvarez Roa 2011; Farmlandgrab 2013). In fact, imageries of a future prosperous space led to a rapid increase in land prices. Even the National Planning Department (DNP, 2011: 32) admitted that there has been a "speculative bonanza in buying land by external investors" with land prices increasing by 700% since 2007, contributing to pressures on peasants and small farmers.

The "frontier" is not just a space where the presence of the state, local and transnational corporations takes a particular form, but is also marked by Brazilian and Argentine influence, presented as a transnational space of possibilities (Portafolio 2014). The project to “modernize” agricultural production looks over the border to the Brazilian Cerrado region as the leading case for the Altillanura. The media calls it the 'Colombian Cerrado' (Semana 2012). This notion borrows on the (contested) image of Cerrado being Brazil's agrarian industries' motor (Semana 2010). In 2011, for example, President Santos invoked his Brazilian counterpart, saying “When they ask me, ‘What do you want to be when grow up,’ I respond, ‘I want to be like Lula’” (CIPAmericas 2011). Brazil is presented as successful by government officials when arguing for an expansion of the ’last grand agrarian frontier‘ (DNP, 2011: 4). This government discourse clearly speaks to Argentine and Brazilian investors as agents of global investment as much as it speaks to Colombian entrepreneurial society. The opposition on the political left in turn has criticized the Altillanura project in Parliament stating that there is no way to implement the Brazilian model in Colombia (“the Altillanura is not anything like the Cerrado”) (Arias 2013). Spaces that had been marginal in political

imaginaries, are now seen as places where dreams of prosperous development will finally come true. These imaginaries are now discursively linked to productivity, progress and utility for capital accumulation: infrastructure and planning conferences, plans to build airports and pave roads constitute its representations.

Yet, the Altillanura is by no means an empty, uncontested space to be newly "developed", nor is it at the boundary of uninhabited space. Rather, if we use the term frontier more analytically, we can understand the Altillanura as a frontier of practices of land control. As Peluso and Lund (2011: 668) remind us, '[t]hese created frontiers are not sites where 'development' and 'progress' meet 'wilderness' or 'traditional lands and peoples'. They are sites where authorities, sovereignties, and hegemonies of the recent past have been or are currently being challenged by new enclosures, territorialisations, and property regimes.'

Underutilization and Land Tenure: The Crystallization of a Rhetoric of Dispossession

A particularly contested discursive element in the government's rhetoric is that of "underutilization". Santos' government is keen on a "more efficient" use of Colombia's thirty-eight million hectares of pasture and grazing lands, especially of the almost eight million of them in the Altillanura (DNP 2016: 12). Planning documents such as the National Development Plan (DNP 2015) and the Orinoquia Master Plan (DNP 2016) condense overall government strategies. These documents provide the framework for a new Global Agricultural Policy. Its "Colombia Siembra" Programme (2015-18) concentrates on terms such as "productivity", fostering the cultivation of flexcrops (soy bean, corn) via loans, technological assistance and irrigation solutions to farmers (Ministerio de Agricultura 2015).

Here we can find another link to Brazil. The Food and Agriculture Organization (FAO: 2003) estimates that around 2.7 billion hectares of arable land worldwide are

currently not agriculturally used. Brazil and Colombia are both among the countries with the biggest share of such 'underutilized' lands (Borras and Franco 2010). In involving the transnational scale of finance and state cooperation – the Brazilian agriculture agency Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) serves as a model for Colombia's Corpoica's technical development (CONPES 2014: 73) – the government frames the 'underutilization' of land as resolving a merely technical problem. Agroindustry is simply considered most efficient. This framing is reasonable when we understand that the Business Association for the Development of Orinoquía Asorinoquia (the directors of transnational and national conglomerates among it), actively participates in elaborating discursive strategies for the region (Portafolio 2014). The idea of utility is implicit in the discursive notion of the "integration of state territory" (CONPES 2014:2), which suggests that infrastructure investments will bring the region closer to the institutional ensemble of the state and thus facilitate valorisation and efficient land use. The Master Plan (DNP 2016) aims to support agribusiness production by providing a state financed, extensive and more intricate infrastructure network, i.e. a road and river corridor named after the oil palm industry.

Tensions over the idea of "underutilization" are obvious. The representation of indigenous territories in the Altillanura is often one of unproductive poverty. Racialized spaces of indigenous misery and backwardness are discursively pitted against prosperity and productivity, as if both were incompatible (DNP 2015: 49, 60, 110). The indigenous use of land is presented as inefficient underuse, a claim which indigenous organizations contest on the rather solid grounds of food production (Cabildo Indígena del Pueblo U'wa de Tamara, Sácama y Hato Corozal 2014; ONIC 2009). Yet, formerly influential cattle ranchers also see themselves confronted with claims to be underutilizing lands. This set of claims against extensive cattle ranches originally stems from calls for progressive, redistributive land reforms, and is distorted here to incite capital-intensive agro-industrial forms of production. The ranchers themselves seem to be utterly sceptical of "modernization", "efficiency" and "sustainability" discourses of those state institutions interested in reshaping Colombia's agriculture along industrial

agribusiness logics (Contexto Ganadero 2014; Noticias de Villavicencio 2013). Their scepticism is logically conditioned upon their quest to reposition themselves in the world economy, as agro-industries require a capital intensity provided more readily by transnational capital groups than local elites (see Peluso and Lund 2011:669)."Underutilization" turns out to be a discursive practice pointing us to specific representations of the Eastern plains: Modern, productive land use, accessibility to their markets and consumers and their accomplished, pacified integration into state territory (CONPES, 2014: 18) all go hand in hand.

Land Tenure and the Discourse of Formalization

President Santos' government aims to formalize existing property relations and link land markets to the financial sector in an effort to "modernize" rural spaces countrywide and create incentives for investment – a goal President Uribe Vélez' government, while seen as more radical, didn't reach. The government's approach is committed to World Bank and IDB discourses favouring private property and the centralized formalization of tenure (Deininger and Byerlee 2011). Investment security and clear land tenure titles are essential discursive elements here. A set of laws - from the National Development Plans to the agricultural policy Colombia Siembra, the ZIDRES and Master Plans - specifically focused on Eastern Colombia as well as on state infrastructure investments, aim for new handlings of land control and a clear-cut model of export-oriented, large-scale agribusiness production.

However, this discourse results in the formalization of property relations after displacement much rather than reversing investment processes (El Tiempo 2013; El Tiempo 2013).[4] Zoning efforts in ZIDRES will possibly prevent any reversal of the

[4] The violent appropriation of land by paramilitary forces during the 1990s and 2000s (well documented, see (Ballvé 2012; Grajales 2011) connects to two processes on global scales. 1) The high demand for land by international investors implies structural pressures. 2) The **

violent process (Las2Orillas 2016: 2). In these zones, particularly focused on production for the world market, peasant land control and production patterns are perceived as problematic. Instead, “productive alliances” are an idea central to ZIDRES. These productive alliances are vertically integrated associations of production between small and mid-sized peasants with major (global) investors (Presidencia 2016: 4) – neither a new nor a very successful idea in Colombian agrarian politics. Productive alliances are really contract farming with an inbuilt loss of the power of decision. With ZIDRES, they reappear as an instrument to bind peasants with their own land parcels to investment-led production, effectively eroding their sovereignty over land and production. Agro-industrial plantations and “productive alliances” as manifestations of enclosure profoundly transform economic and livelihood spaces of now autonomous peasants, much more so than discursive elements of utility, economic possibility and the efficiency of these associations suggest.

Even the state agency Consejo Nacional de Política Económica y Social (CONPES), the highest organ of economic policy coordination, admits that corporations have realized "territorial planning de facto via [...] changes in land use" (CONPES 2014: 23). Yet, this only leads CONPES to call for the "security of land titles" (ibid.). In the face of existing power relations, the "security of titles" has

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concentration of seeds production at transnational companies mirrors state regulation which reduces or prohibits the exchange of local seeds varieties by small-scale farmers. The concentration of seeds production at transnational corporations and state regulation which poses restrictions on peasant-produced seeds and their exchange and sale, in order to establish countries as market destinations for seeds producers contain enormous potential conflict (Borras et al. 2012; see). In Colombia, dispossession of seeds went to extreme consequences, authorities setting fire on seeds confiscated from small farmers on the grounds of directive ICA 970. The outrage following led to the corresponding government directive being withdrawn and rewritten (Grupo Semillas 2015). The alternative cultivation of seeds becomes thus an emancipatory act. Agrarian movements have addressed seeds as central to their struggle (Góngora Mera/Motta 2014: 423).

meant security, and thus land control, only for the upper segments of the social spectrum. Colombian corporate representatives in turn claim that notarial registrations of land titles should no longer be refutable, to guarantee investment returns. In this logic, investment security and clear land tenure titles are essential because they enable promising agro-industrial investments even in regions with massive displacements in the past (and present). Many peasants in the Altillanura in turn do not have formal land tenure. Displaced people cannot prove their former control of land, their strategy has been not to argue for security of titles but for retorno (right to return). Corporations in the Altillanura, however, do not see this as necessary. This is not to say that current efforts of modernization have included the return of Colombia's up to five million displaced people to their land (PNUD 2011). Despite some new legislation on the matter, they have not. Much rather, the discursive element 'land tenure' provides the basis for formalizing property as it is. Tenure thus becomes itself a mechanism of enclosure. Land is territorialized in Peluso and Lund's (2011) understanding, with clear boundaries around it.

The one element linking each of these pieces of legislation (ZIDRES, Colombia Siembra, CONPES) is the distribution of baldío-rights which formally prohibits large-scale acquisitions of state-owned land. In the Altillanura, the so-called Family Agricultural Unit (Unidad Agrícola Familiar - UAF) regulates the maximum number of hectares which can be legally acquired if the land is still state-owned.[5] However, corporations such as Riopaila Castilla, Cargill or Poligrow (La Silla Vacía 2013a) are implicated in the illegal accumulation of land with extensions above 10,000 hectares. These companies belong to Colombian consortia such as Santo Domingo and Sindicato Antioqueño or in transnational financial networks. These large economic conglomerates have established strings of shell companies under their control which then each acquired only the allowed number of hectares,

[5] The size of UAFs is based on soil quality and other factors and in the Altillanura can not exceed .100 Ha (NASA ACIN 2014).

strategies later known as 'fragmentation of ownership' (ibid., Oxfam 2013; SOMO and INDEPAZ 2015). A clear example is the case of Riopaila Castilla SA, who schemed up 28 independent companies, all with the same amount of capital, address and representatives, which then rented their smaller plots to Riopaila. That way, Riopaila accessed some 40,000 hectares of state-owned plots (Arias 2013: 6). Similarly, the legal firm Contexto Legal established a number of companies which all coincide in parts of their names, dates of establishment and investment in the same Altillanura municipality of Primavera and were registered in the British Virgin Islands (La Silla Vacía 2013). Shareholders are unclear in this latter case. Poligrow, another company involved in rapidly transforming the Altillanura to be dominated by large-scale plantations, invests in an oil palm extraction plant in the town of Mapiripán, the point of departure for paramilitary expansion in 1997. Shareholders from Spain, Uruguay, Panama and Italy formed a complicated corporate network and illegally accumulated plots in Mapiripán around 2014 (Poligrow Agroindustrial) (SOMO and INDEPAZ, 2015: 38ff.). "Drop by drop" displacements[6] in the years prior were due in part to pressures by an armed group on town council members between 2008 and 2011. These council members were persuaded to support municipal efforts to authorize negotiations that legalised land expropriations (La Silla Vacía, 2013, SOMO and INDEPAZ, 2015: 36, 29). Patterns of fictitious investment, middlemen, and strategies such as black market peso exchange can be found in land deals across the Altillanura (SOMO and INDEPAZ 2015: 30).

In Colombian media, these events became branded as scandal yet seldom linked to the systematic restructuring of control and access to land via displacement that has taken place since the 1990s. In fact, the cases show how a multiplicity of scales of regulation (local, national, global investment flows) converged with local

[6] Drop-by-Drop displacements don't take part as the exodus of large numbers of people, but rather can be seen as a slow drain of individuals and single families giving in to pressures to leave.

constellations of social forces at the so-called "frontier", - not least armed actors and forces of coercion – linking de facto appropriation to the imperative to legalize this control. The appropriation of baldíos in the Altillanura region has shown how investment incentives contribute to violent displacement and a transition from public goods to private property. State land has become a prime frontier of capitalist expansion (Kelly and Peluso 2015). This is the "frontier" that is hidden in government discourses on formalization and security of tenure. Security of tenure thus has to be dialectically understood together with dispossession.

The Bioeconomy Dimension of Discourse: Displacement is Green and Food is Secondary

The radically unequal access to land mingles with ecological dimensions and economic, social and cultural rights in this debate. This drive for land in Eastern Colombia is intimately linked to new forms of enclosure revolving around what is now called the "bio-economy", loosely defined as a spectrum of (production) processes and services around the conversion of renewable resources into bio-based products, often celebrated as a transition to a smart, sustainable economy (Braun 2015: 242ff. for a debate on definition). The new paradigm is flex crops with multiple uses (feed, food, fibre, fuel), often harvested year-round which entail new labour processes, control measures and economic agents (Peluso and Lund 2011:668). During the last decade, oil palm production continually grew in terms of hectares, and agricultural and land laws contain incentives for those investing in the sector. The Palm Producers Federation Fedepalma itself announced that a majority of the 1.6 million hectares it has in mind for palm production until 2032 are projected in the Orinoquía region (see NASA ACIN 2014). Poligrow is one of the companies involved in rapidly transforming the Orinoquía, part of the Altillanura, into a region dominated by oil palm production and large-scale plantations. Indigenous organizations argue that this goes hand in hand with "desiccation, deforestation, substitution of woodland and the loss of autochthonous cultures" (NASA ACIN 2014); leading to various complaints being filed.

Companies in turn claim to be socially responsible and environment-friendly, developing precisely these areas: Oil palm production is presented as synonymous with “innovative concepts of energy and environment” (Poligrow, 2017).

The Interamerican Association for Environmental Defense Colombia Chapter (AIDA) called the idea to make rules more flexible and accelerate the process of getting ’express environmental licenses explosive’ (cited in La Silla Vacía 2013b) “. These organizations stress the ‘exacerbating environmental risks’ inherent in the ‘intensification of agriculture’ (Suárez Montoya 2012: 1). The profitability of energy production on a water, wind or agrofuel basis is again dependent on land control. Referring to the so-called clean tech products, two hardly reconcilable discourse coalitions oppose each other. On the one hand, grassroots organizations demonstrate how allegedly ‘clean energy projects’ clash with social and environmental rights in a tension extremely difficult to resolve (Blog RC y Sostenibilidad en Colombia 2012; Chejne 2012; Suárez Montoya 2012). For some organizations cited above, the discourse on clean energy in the Altillanura is hardly more than a badly-disguised modernization discourse (La Silla Vacía 2013b; Suárz Montoya 2012); others state, Colombia was in delay to use the benefits of clean energy. They state the need for „high value-added“ alternatives to resource extraction (Chejne 2012). We might speak of bio-enclosures to analyze this process of acquiring land control. Focusing on a similar process, Backhouse (2015) has written in detail about green enclosures in Brazil through palm oil production. The process in Colombia mirrors this, with the important difference that the bio-economy discourse expands on the basis of extremely violent displacements executed by paramilitaries since the 1990s, in logistical collusion with parts of the state.

Interestingly enough, discourses on land and bioenergy don't focus on food. So far, small-scale farming is still a core source for urban food markets (PNUD 2011). However, the priority of bioenergy and flexcrop production in the dominant discursive positions on the Altillanura imply this is about to change. As soil in the Altillanura isn't easily made suitable for intensive food farming, some scientific

discourse interventions suggest the region should actually be reserved for larger private investment, not without claiming radical land redistributions in other regions (El Espectador 2014). The vertical integration of the corresponding production chains add another layer that impedes the participation of small-scale (or even communal) farming in the value-adding steps of the chain. Other than the apparent need for biological energy production, food sovereignty makes no appearance in government and corporate discourses. For grassroots organizations, however, food sovereignty is not just an end in itself (far beyond food security), but encompasses autonomy and land control by small-scale peasants with no more than half a hectare of land (Grupo Semillas 2015; Suárez Montoya 2012). Recognizing the scale of intermediaries between producers and supermarkets who absorb large parts of profit, grassroots organizations argue for "small, local market and production circuits, so that consumers in the city and producers in rural spaces come closer together again" (Castellanos 2011:n.p.). Discourses on the Altillanura "frontier" of bio-economy thus entail an element of competition for land between different forms of production. To foster links between consumers and producers with little geographic distance is a way to foster political subjects able to link land and food politics and who can oppose the existing drive for the legalization of dispossession. As we can see below, this strategy fuelled the agrarian strike of 2013 and was strengthened during the strike.

Political Subjectivity and Visibility of Counter-Discourses

One consequence of peasant perceptions of not being heard has been the participation in massive agrarian strikes in 2013 (Semana 2013). The places where politics is enacted and discourses forged are essential in securing land control. The comments by the still influential representative of land owners Agricultural Producers' Society (Sociedad de Agricultores - SAC), Rafael Mejía in 2013 are an example (Agencia Prensa Rural 2013). As peasants were protesting low prices and pressures on them by agribusiness, Mejía's uneasy and ambiguous reaction shows how sectors represented by SAC approach autonomous political agency by peasants

in general. Mejía criticized peasants not for their protest as such but for negotiating "outside of the institutions", bypassing those arenas which had historically presented themselves as representatives of Colombian agriculture, but should be better understood as strategic interest groups for large landowners – who do hold clear land titles. The inequality in access to titling (with deep historical roots) is omitted in this discourse. In the agrarian strike of 2013, opposing agrarian restructuring in the Altillanura and the rest of the country, months- long mobilizations included grassroots organizations, with truckers, micro-businessmen in informal mining, care workers, teachers and students joining the protests. They acknowledged the link between global investment, legal discourses on the use of land and the precarious conditions for those actually producing food. A whole different worldview is encompassed in what might seem a small discursive and representational modification during and since these protests. The ruana, a widely worn poncho in rural Colombia usually associated with poor or indigenous peasants, became the symbol of emancipatory protest (CED-INS 2011). In Bogotá, supporters even put on ruanas made of paper and redefined the ruana from a symbol of poverty and" backwardness" to strength and food production. Not only did protesters deconstruct dominant imaginaries of "progress", "efficiency" and the paradigm of productivity/utility, they also awarded the conflicts at the frontier a certain mobility to be played out in more visible spaces. In Bogotá and other bigger cities, where peasants from those places usually are represented as 'near empty' and 'wild', beyond the "frontier", acquired voice.

Concluding Remarks

The analysis of Colombia's efforts to restructure the Altillanura and its discursive representations certainly make clear how contested these spaces really are. Theoretical frameworks such as the concept of land control and enclosure (i.e. Peluso and Lund 2011; Backhouse 2015) help understand how this restructuring is taking place. Behind the discursive representations actual conflicts at the agricultural "frontier" exist, and dominant economic strategies are contested. The

Altillanura eludes the characterization as 'marginal-unused/underutilized-empty' land. This remaking of the Altillanura involves its commodification and distinct processes of enclosure. Grassroots organizations in Colombia approach these other (seemingly less violent) politics of dispossession creatively.

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