Bolivia's Resistance to Modification and Commodification of Seeds: Challenges in Aligning Domestic Situation with its International Position

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The study was carried with financial support from the Vlaamse Interuniversitaire Raad (VLIR-UOS) as a Global Minds Small Great Projects of Vrije Universiteit Brussels (VUB), Brussels, Belgium in collaboration with Universidad Mayor Real y Pontificia de San Francisco Xavier de Chuquisaca (USFX), Sucre Bolivia.

Abstract

Based on the concept of *vivir bien*, Bolivia has developed laws resisting modification and commodification of genetic resources. It has played an important role in international forums in promotion of these ideas and has been contributing to international law-making for farmers' rights. From the perspective of farmers' rights to seeds, this article examines Bolivia's Plant Variety Protection (PVP) legislation and the cultivation of genetically modified (GM) soybean, the crop most frequently protected under PVP.

The article argues that while Bolivia has laws discouraging the modification and commodification of seeds and has been internationally resisting the same in favour of farmers' rights, domestically, the soybean farmers cannot exercise their minimally recognized rights of saving seeds under the PVP law. This article shows that mere exception to save seeds is not adequate to retain farmers' ownership over the seeds, particularly in industry-intensive farming. Therefore, the seed suppliers can exercise more rights than granted by law, ultimately securing the repeated purchase of seeds even from the smallholders. Besides, the article shows how the agro-industrial sector has influenced the government and has successfully accommodated their interest in the broader political objectives of food sovereignty and farmers' rights.

The article proposes that enabling these smallholders to exercise their legally recognized right to save and repeatedly use their own seeds could be one of the means to protect them from the agricultural exclusion currently happening in the soybean sector in Bolivia.

1. Introduction:

After the political change in early 2000, Bolivia has been nationally and internationally promoting an alternative development vision based on *vivir bien* (living well), which amongst other things, upholds the principle of non-modification and non-commodification of genetic resources. Emerged in Latin America as a critique of classical Western development theory,[1] *vivir bien* is based on the indigenous tradition, promoting to live in harmony with nature and in equilibrium with all forms of life.[2] Being one of the first countries along with Ecuador, to constitutionally recognise *vivir bien,* Bolivia has been playing a significant role in transposing the concept in international forums for the promotion of the rights of farmers, indigenous people, and nature.

Against the background of Bolivia's effort and success in international forums to resist the commodification of seeds and promote farmers' rights, this article explores the situation of farmers' rights in Bolivia concerning its Plant Variety Protection (PVP) law and plantation of Genetically Modified (GM) soybean. While Bolivia has been internationally resisting the commodification of seeds with a concern for corporate monopoly and farmers' dispossession of seeds, this study shows that Bolivia finds itself in a difficult position nationally where such monopoly and dispossession are already prevalent in the soybean sector. Rather, the agro-industrial sector has successfully accommodated its agenda within the narrative of food sovereignty and farmers' rights.

This study involves interviews (in-person and online) with concerned stakeholders, including farmers, farmers' association, civil society organisations, government authorities, the private seed sector and experts, carried out mainly between May and July 2021 around Santa Cruz, Bolivia.[3] A total of 20 individual interviews were carried out in Spanish with the help of a translator. The interviews were recorded and transcribed for analysis. While the names of respondents are kept anonymous, their designations and institutions are mentioned when the response was recorded on behalf of their respective institutions.[4]

The article first discusses Bolivia's national and international position and initiatives for non-commodification of genetic resources in accordance with *vivir bien.* Then, through the lens of PVP law and farming of GM soybean, it explores farmers' experience in dealing with the seeds, showing the disparity between the political positioning and situation in the field. The article then sheds light on the challenges that led to such continued disparity and hinderance to strengthening farmers' position in seed ownership.

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[1] E Gudynas, 'Buen Vivir: Today's Tomorrow' (2011) 54 Development 441.

[2] PV Calzadilla and LJ Kotzé, 'Living in Harmony with Nature? A Critical Appraisal of the Rights of Mother Earth in Bolivia' (2018) 7(3) *Transnational Environmental Law* 397, 403; For a historical overview of the development of the concept in Latin America from local and global context see AE Beling, AP Cubillo-Guevara, J Vanhulst and AL Hidalgo-Capitán, 'Buen Vivir (Good Living): A "Glocal" Genealogy of a Latin American Utopia for the World' (2021) 48(3) *Latin American Perspectives* 17.

[3] The USFX facilitated to carry out the field study from May-July 202. The information letters were dispatched by the university to the concerned stakeholders and verbal consent were taken during the interviews as certified by Centro de Studios de Posgrado E Investigación (0516).

[4] Verbal consent to publish was taken during the interview.

2. Bolivia's departure from neoliberal policies towards *vivir bien:*

Neoliberal capitalism, according to Harvey, is based on 'accumulation by dispossession', which, he argues, leads to continued accumulation of resources and depletion of global commons.[5] Opening new fields for capital accumulation through privatization and commodification is one of the major features of accumulation by dispossession.[6] The extension of Intellectual Property Rights (IPR) on plant genetic resources by defining seeds as private property and limiting the farmers' rights of saving seeds for the following year is one of such new mechanisms of accumulation by dispossession.[7] This has also been referred to as 'biological dispossession'.[8] In line with *vivir bien,* Bolivia is vocal against neoliberal capitalism, the commodification of genetic resources, and biological dispossession.

The neoliberal policies adopted by Bolivia in the 1980s could neither deliver economic growth and employment nor could it address the concerns of the rural and indigenous population.[9] The series of popular demonstrations by various social groups and indigenous organizations demanding structural reform of law and policies led to the collapse of the neoliberal regime in 2003, the victory of Evo Morales (Movimiento al Socialismo) in 2005, and the promulgation of the new constitution in 2009.[10] The Bolivian constitution of 2009 has been described as a 'novel development' in Latin American constitutional theory and practice[11] and even as 'the most radical [constitution] in the world'[12] in terms of incorporation of international human rights standards.

The constitution declares to have 'left the colonial, republican and neoliberal State in the past' (preamble) and recognizes ancestral principles of *suma qamaña* or *vivir bien* as one of the ethical and structural principles of the state.[13] *Vivir bien* '*challenges the anthropocentric approach to civilization based only on the power of markets and financial resources, in which ... development is a means without end*.'[14] Questioning the teleological notions of development,[15] *vivir bien* presents an alternative to neoliberal development model.[16] The

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[5] D Harvey, *The New Imperialism* (Oxford University Press 2003), 145-152.
[6] D Harvey, *A Brief History of Neoliberalism* (Oxford University Press 2007), 160.
[7] Harvey (n 5) 147–148.
[8] K Peschard, 'Biological Dispossession: An Ethnography of Resistance to Transgenic Seeds Among Small Farmers in Southern Brazil' (Doctor of Philosophy, McGill University 2009), 27.
[9] BH Kohl and LC Farthing, *Impasse in Bolivia: Neoliberal Hegemony and Popular Resistance* (Zed Books 2006), 83.
[10] FV Belmonte, 'Right to Justice and Diversity of the Indigenous Peoples of Bolivia' in *Peacebuilding and the Rights of Indigenous Peoples: Experiences and Strategies for the 21st Century*, vol Springer (2017); Kohl and Farthing (n9); A Schilling-Vacaflor, 'Bolivia's New Constitution: Towards Participatory Democracy and Political Pluralism?' (2011) Estudios Latinoamericanos y del Caribe 3.
[11] NV Vargas Gamboa, 'The Role of International Human Rights Law in Bolivia's New Constitution: A Fresh Step in Latin American Constitutional Theory and Practice' (2021) 42 *University of Pennsylvania Journal of International Law* 581
[12] R Lalander, 'Ethnic Rights and the Dilemma of Extractive Development in Plurinational Bolivia' (2017) 21 *International Journal of Human Rights* 464
[13] Art 8, Constitution of Bolivia 2009, Art 8.
[14] Plurinational State of Bolivia, *Living-Well in Balance and Harmony with Mother Earth: A Proposal for Establishing a New Global Relationship between Human Beings and Mother Earth* (2014), 21.
[15] LC Farthing and BH Kohl, *Evo's Bolivia* (University of Texas Press 2014), 99-100.
[16] E Gudynas, 'Development Alternatives in Bolivia: The Impulse, the Resistance, and the Restoration' (2013) 46 *NACLA Report on the Americas* 22, 22; P Villavicencio Calzadilla and L J Kotzé, 'Living in Harmony with Nature? A Critical Appraisal of the Rights of Mother Earth in Bolivia' (2018) 7 *Transnational Environmental Law* 397, 404; Farthing and Kohl examine how Bolivia has employed *vivir bien* in its efforts to improve the quality

Framework Law 300 of Mother Earth and Integral Development for Living Well of 2012 defines *vivir bien* as '*the alternative civilizational and cultural horizon to capitalism and modernity that is born in the cosmovisions of the indigenous native peasant nations and peoples ... It means living in complementarity, in harmony and balance with Mother Earth and societies*...' (Art 5(2)).

In line with the concept of *vivir bien*, Bolivia recognizes the rights of Mother Earth or nature. The rights of Mother Earth and their protection are outlined in two statutes[17]: (i) the Law 071 of the Rights of Mother Earth of 2010 specifies the rights to which Mother Earth is entitled; and (ii) the Framework Law 300 of Mother Earth and Integral Development for Living Well (*vivir bien)* of 2012 operationalizes the rights of Mother Earth set out in the Law 071 in the context of the integral development for *vivir bien*. It serves as a normative standard under which other sectoral laws should operate.[18]

Along with other rights, the law recognizes the right of Mother Earth to the diversity of life. It states that the mother earth has the right to preservation of the diversity of beings, without being genetically altered in their structure 'in such a way as to threaten their existence, functioning and future potential'.[19] The regulation of the production, importation and commercialization of Genetically Modified Organisms (GMO) is also required by the constitution of Bolivia.[20] Therefore, as one of the bases of *vivir bien*, the Law 300 prohibits the introduction, production, use, release and commercialization of genetically modified (GM) seeds in Bolivia. However, genetic modification is not prohibited in all the species, but on the crops 'which Bolivia is the centre of origin or diversity' and those 'that threaten the genetic heritage, biodiversity, the health of life systems and human health'.[21] Nevertheless, the law

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of life. They suggest that incorporating an 'alternative vision of what development might be', has contributed to programs that reflect new, albeit imperfectly executed, perspectives in health, education, economic development, and social welfare.' LC Farthing and BH Kohl, *Evo's Bolivia* (University of Texas Press 2014); For discussion on court's judicial interpretation of vivir bien and indeterminacy see MI Dolhare and S Rojas-Lizana, 'Applying the Principles of Vivir Bien to a Court Resolution in Bolivia: Language, Discourse, and Land Law' [2022] *Critical Discourse Studies* 1.

[17] Both laws emerged from a single negotiation process between the Bolivian government and the indigenous organisations of the Unity pact. The Unity Pact (Pacto de Unidad) was a coalition of the largest indigenous and peasant organizations in Bolivia formed in 2004 with the objective of ensuring their full participation in the constitutional drafting process and in the future governance of the country. The Unity Pact also assumed the mandate of formulating a draft law on Mother Earth (Unity Pact Draft Law). The Unity Pact Draft Law maintained a strong ecocentric orientation. But the Unity Pact Draft Law was not adopted, and the legislative process eventually resulted in the adoption of two laws currently in force. The government is criticised for proceeding with the diluted version from the Unity Pact Draft Law and excluding the Unity pact in the process. (See Villavicencio Calzadilla & Kotzé (n 15).

[18] Law 300, art. 2 Scope and Application: The present Law has scope in all sectors of the central level of the Plurinational State of Bolivia and of the autonomous territorial entities in the framework of the competences assigned in the Political Constitution of the State, the Law N° 031 Framework of Autonomies and Decentralisation 'Andrés Ibáñez' and the Law N 071 on the Rights of Mother Earth; The Framework character of the law implies that it is superior to other laws and the laws involving the subject matters of the Mother Earth must correspond with and are subject to the Framework law Lalander (n 12), 472.

It is constituted as a Framework Law and of preferential application for the development of specific laws, policies, norms, strategies, plans, programmes and projects.

[19] Art 7(2) of the law 071: To the diversity of life: The right to the preservation of the differentiation and variety of the beings that make up Mother Earth, without being genetically altered or artificially modified in their structure in such a way as to threaten their existence, functioning and future potential.

[20] Constitution of Bolivia 2009, art 409

[21] Art 24(7) of the law 300: Develop actions to protect the genetic heritage of agrobiodiversity, prohibiting the introduction, production, use, release into the environment and commercialisation of genetically modified seeds

explicitly obliges the government to gradually eliminate the cultivation of GMO authorized in the country.[22] Similarly, to satisfy the needs of Bolivian people for *vivir bien*, the state is also required to develop a balanced form of production and consumption pattern, safeguarding the regenerative capacities and vital balance of Mother Earth.[23]

The Framework law explicitly prescribes the principle of Non-Commodification of the Environmental Functions of Mother Earth.[24] It states that the environmental functions and natural processes of Mother Earth's components and life systems are not considered as commodities but as gifts of the sacred Mother Earth. In clear words, the law requires the state to prevent the commodification of genetic resources, biopiracy and the illegal transfer of genetic material, as well as monopoly and/or oligopoly in the production and marketing of seeds and food in order to promote the right to food and food sovereignty in line with the objectives of *vivir bien*.[25] The law requires to implement policies and programmes for the maintenance of the genetic heritage and the diversity of genetic resources existing in the country and the ancestral knowledge associated with them.[26]

The constitution also sets the objective to 'guarantee food security and sovereignty, prioritizing the production and consumption of agricultural foods produced in the territory of Bolivia'.[27] Accordingly, adopting sustainable rural development as a fundamental part of economic policies, the constitution encourages economic undertakings to emphasize on food security and sovereignty.[28] It prioritizes sustainable increase of agricultural productivity and the strengthening of the economy of the small agricultural and livestock producers.[29] It contains several provisions relating to the environment, natural resources and biodiversity, as well as access and benefit sharing.[30] Remarkably, it also guarantees the right to collective ownership of intellectual property to knowledge of indigenous people.[31]

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in the territory of the Plurinational State of Bolivia, of which Bolivia is the centre of origin or diversity, and of those that threaten the genetic heritage, biodiversity, the health of life systems and human health.

[22] Art 24(8) law 300 Develop actions to promote the gradual elimination of cultivation of genetically modified organisms authorised in the country to be determined in a specific rule.

[23] (Art 8(3), Law 071);The law provides that the exercise of individual rights is limited by the exercise of collective rights in the living systems of Mother Earth, and any conflict of rights must be resolved in ways that do not irreversibly affect the functionality of living systems (Article 6, Proviso, Law 071)

[24] Art 4(2) of law 300; Art 5 (8) defines Environmental functions. It is the result of the interactions between the species of flora and fauna of the ecosystems, the dynamics of the ecosystems themselves, the space or physical (or abiotic) environment and solar energy. The following are the examples of environmental functions … pollination (provision of pollinators for reproduction of plant populations and seed dispersal), .. biological control (regulation of population dynamics, pest and disease control)…; Similarly, (Art 2(5) law 071):The law also states that the life system and the process they sustain cannot be commodified, nor can form part of anybody's private property, enlisting non-commodification as one of the binding principles.

[25] Article 13(5) law 300; Similarly, the constitution (Article 314) prohibits private monopolies and oligopolies, as well as any other form of association or public or private legal agreement by Bolivian or foreign persons, who attempt to control and have exclusivity over production and commercialization of goods and services.

[26] (Art 23(3), Law 300

[27] Constitution of Bolivia 2009, art 407(1).

[28] ibid, art 405; Furthermore, the provision of right to food along with the obligation of State is enshrined in Article 16 of the Constitution of Bolivia. Article 16:(I) Every person has the right to water and food. (II)The State has the obligation to guarantee food security, by means of healthy, adequate and sufficient food for the entire population.

[29] See art 405 (1), (5); Similarly, the Constitution stipulates the objectives, amongst others, 'To establish the creation of a seed bank and centres of genetic research' (art 407 (9)).

[30] Articles 380 to 383 have provisions on biodiversity. There are provisions relating to environment, natural resources and biodiversity, access and benefit sharing in Art 342; 343, 345(2); Art 349, 353, 354.

[31] Art 30(11)).

The stipulation of the concept of 'food sovereignty' in its constitution, according to Holt-Giménez and Shattuck, is the 'radical' trend in the global food movement, which seeks deep, structural changes to food and agriculture.[32] Geddes refers to the efforts of Bolivia to bring together the issues of decolonization, democratization, alternatives to capitalism, economic growth, ecological sustainability and redistribution, and to build a bloc of support, as an attempt to create a counter-hegemony in the Gramscian sense, against the hegemony of neoliberalism.[33] In fact, the former vice-president and Gramscian scholar Alvaro Garcia Linera turns to Gramsci in presenting and debating economic and political strategy and argues that *indianismo* has expanded to become a proto-hegemonic conception to challenge neoliberal ideology.[34] As it will be discussed in the next section, Bolivia has been remarkably successful in influencing international law with its alternative vision to development, taking its counter-hegemonic initiatives to international forums. Such efforts of Bolivia have been praised for leading to the 'decolonization of international law'.[35]

3. Bolivia's Position in International Forums:

Adopting and promoting the harmonious relationship between human and nature in its constitution and in its international stance, Bolivia has secured an 'ethno-ecologist image'.[36] Bolivia has been able to transpose its constitutional values in international forums and contributes to international law-making in the areas relating to the protection of nature, peasants and indigenous people. Bolivia's counter-hegemonic initiatives in international institutions to promote the concerns of ecology and social justice could be referred in O'Connell's term, as an effort of 'subaltern globalization', which he says, is driven primarily by the victim of neoliberal globalization.[37] While the constituent elements of such movement are drawn from a wide range of stakeholders, including peasants, indigenous communities, environmentalists, feminists, human rights and social justice activists, etc., they coalesce around the critique of the dominant neoliberal global system.[38]

In 2009**,** at Bolivia's initiative, the United Nations (UN) General Assembly designated 22 April as International Mother Earth Day.[39] The same year, Bolivia initiated negotiations on the principles of harmony with nature, which led to the UN General Assembly Resolution on

[32] Giménez & Shattuck differentiate, on the one hand hegemonic corporate food regime comprised of 'neoliberal' and 'reformist' actors, and global food movement comprised of 'progressive', and 'radical' trend. E Holt-Giménez and A Shattuck, 'Food Crises, Food Regimes and Food Movements: Rumblings of Reform or Tides of Transformation?' (2011) 38 *Journal of Peasant Studies* 109, 128.
[33] M Geddes, 'The Old Is Dying but the New Is Struggling to Be Born: Hegemonic Contestation in Bolivia' (2014) 8 *Critical Policy Studies* 165
[34] A García Linera, 'Indianismo and Marxism: The Mismatch of Two Revolutionary Rationales (Translated by Richard Fidler)' (2008) https://links.org.au/indianismo-and-marxism-mismatch-two-revolutionary-rationales accessed 2 April 2023; ibid.
[35] A Rodiles, 'Is There a "Populist" International Law (in Latin America)?' in Janne E Nijman and Wouter G Werner (eds), *Netherlands Yearbook of International Law*, vol 49 (Springer 2019)
[36] Lalander (n 12) 456.
[37] P O'Connell, 'On Reconciling Irreconcilables: Neo-Liberal Globalisation and Human Rights' (2007) 7 *Human Rights Law Review* 483
[38] Ibid, 494.
[39] See UNGA, International Mother Earth Day, 22 April 2009, UN Doc. GA Res 63/278 (01 May 2009)

Harmony with Nature[40] initiating annual debates, Secretary General reports on the advancements of the rights of nature worldwide, and a series of General Assembly resolutions on the subject matter.[41]

The Bolivian constitution states that the negotiation, signing, and ratification of international treaties should be governed by: (a) harmony with nature, defence of biodiversity, and prohibition of private appropriation of plants, animals, microorganisms and any living matter, (b) respect for the rights of indigenous people and peasants and (c) food security and sovereignty for the entire population.[42] Similarly, Art 8(3) of the Law 071 obliges the state to develop policies to defend Mother Earth at the international level from the overexploitation of its components and commodification of life systems or the processes that sustain them.

In 2008, regarding the amendment of Article 27.3(b) of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) in the TRIPS council, Bolivia reignited the debate on whether life forms should be patentable, referring to the then draft constitution of Bolivia. Bolivia argued, '*In the view of indigenous peoples, life could not be patented. Biodiversity resources, genetic resources, their derivative products, and traditional knowledge should not be patented, as they do not constitute inventions, but discoveries of nature or the fruit of accumulated ancestral knowledge. No one could claim ownership over seeds, plants, animals, and human, animal and plant genes, or the microorganisms which were a fundamental component of life*'.[43] Bolivia further continued arguing, '*patents would result in genetic resources, derivative products and traditional knowledge being appropriated by a few large multinationals, since the patent system had been designed precisely to satisfy the private and business interests of such companies.'*[44]

To strengthen its position against the commodification of life forms, it made submissions to the TRIPS Council in 2010 and 2011. In the first submission, citing the above-mentioned constitutional principles for negotiation, signing and ratification of international treaty in terms of rights of indigenous people and peasants and harmony with nature, it called for urgent need to review the Article 27.3(b), in order to: (a) prohibit patenting of all life form[45], (b) ensure the protection of the innovations of indigenous and local farming communities and the continuation of the traditional farming practices including the right to save, exchange and save seeds, and sell their harvest; (c) prevent anti-competitive practices which threaten food sovereignty of people in developing countries; and (d) to protect the rights of indigenous

[40] UNGA, Resolution adopted by the General Assembly on 21 December 2009 Harmony with Nature, A Res 64/196, 12 Feb 2010; see the official website of Harmony with Nature at http://www.harmonywithnatureun.org/ (accessed 08 Nov 2022).

[41] For the most recent resolution adopted by General Assembly see UNGA, Resolution adopted by the General Assembly on 21 December 2020 Harmony with Nature. A/RES/75/220 30 Dec 2020; For discussion on contribution of Bolivia in International law making see Rodiles (n 30), 87-89.

[42] See Art 255(I)(4),(7),(8); Similarly, Article 255(II)(3): Defense and promotion of human, economic, social, cultural and environmental rights... (4) Respect for the rights of native indigenous rural people.

[43] WTO, 'Minutes of Meeting (Council for Trade-Related Aspects of Intellectual Property Rights) IP/C/M/57. 16 September 2008' (2008), para.35.

[44] ibid

[45] Including plants and animals and parts thereof, gene sequences, micro-organisms as well as all processes including biological, microbiological and non-biological processes for the production of life forms and parts thereof see para 30.

communities and prevent IP claims over their traditional knowledge.[46] It problematized the effect of concentration of ownership of patents in a few companies and detrimental effects on competition and on social and economic situation, including food sovereignty and livelihood of farmers.[47] It also pointed out the pressure for countries to adopt certain model of PVP legislation and affirmed the importance to ensure '*that innovations of indigenous and local farming communities; the continuation of traditional farming practices including the right to use, exchange, save seeds and sell their harvest is recognized and protected... to take measures to prevent anti-competitive and other practices, which threaten food sovereignty in developing countries*.'[48]

Referring to the philosophy of *vivir bien,* Bolivia stated that '*The strong connection that Bolivian indigenous culture has with nature is the heritage of humanity and represents an alternative to the capitalist model of development, that is in crisis and in which development is linked to the depredation of natural resources for short-term profit*.'[49]

In the second submission in 2011, Bolivia highlighted the trend in patenting the life form, such that a few transnational corporations exercise monopolistic control over some of the most important sectors such as food, agriculture and health, and called to amend Article 27.3(b) of the TRIPS Agreement to prohibit the patenting of life forms and parts thereof.[50] Bolivia argued that the adoption of the article promoted a new phase of extension of capitalism into nature that is allowing the privatization of life itself.[51] Further, Bolivia claimed that the extensively broad claims of patent encompasses all the plant genetic resources, seeds, plants, the harvests and their use in food production, as well as the use of the patented plants in later generations and after further crossings, which ultimately hampers innovation.[52] It can constitute a direct impediment to innovation by farmers.[53] Quoting the former UN special rapporteur on the Right to Food, Bolivia contended that IPRs reward and encourage standardization and homogeneity, when what should be rewarded is agrobiodiversity, in the face of the emerging threat of climate change.[54]

Countries like Bangladesh, Cuba, Ecuador, and Nepal have been supporting Bolivia's stand regarding the review of Article 27.3 (b).[55] In the same line as Bolivia, the Least Developed Countries (LDC) group took a strong position stating, '*we do not support the patenting of life forms comprising plants and animals. We call for the review of this article in order to protect developing countries and LDCs from the negative effects of this provision on the key sectors that affect their livelihood such as agriculture, health, food and climate change.*

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[46] WTO, 'Communication from Bolivia (Council for Trade-Related Aspects of Intellectual Property Rights) IP/C/W/545 26. February 2010' (2010), para.30
[47] ibid, para,18.
[48] ibid, para.23.
[49] ibid, para. 27.
[50] WTO, Communication from the Plurinational State of Bolivia (Council for Trade-Related Aspects of Intellectual Property Rights) IP/C/W/554. 28 March 2011' (2011)
[51] ibid, para. 6.
[52] ibid, para. 26.
[53] ibid, para 27.
[54] ibid
[55] For the discussion on the review of Article 27.3(b), see J Plahe, N Kukreja, and S Ponnamperuma, 'Review of Article 27.3(b) and the Patenting of Life Forms: Hitting a BRIC Wall in the WTO?' (2021) 26 *International Negotiation* 289.

This would help ensure inter alia: food security and preserve the integrity of rural and local communities. Patenting of life forms at a multilateral level should be prohibited.'[56] It is interesting to note that the LDC had previously relied on bigger countries like India and Brazil to strengthen their voice in the World Trade Organisation (WTO). However, India and Brazil, as Plahe et al. observe, have moved away from the questions about the morality of patenting life forms to an amendment to TRIPS which would prevent bio-piracy and include prior informed consent and the equitable sharing of benefits arising from patents on genetic materials.[57] As such, there is a South-South divide in the Article 27.3(b) review discussions; India and Brazil leaning towards neoliberalism on the one hand, and Bolivia and the supporting LDCs continuing to challenge the moral grounds for patenting of life forms and the erosion of community rights, thereby, serving 'an important counterbalancing role by championing a valid alternative viewpoint'.[58]

Bolivia also played an important role in the adoption of the United Nations Declaration on the Rights of Peasants (UNDROP) in 2018. As a main proponent of the Declaration, Bolivia led the creation of the Core Group to present resolutions to the Human Rights Council, the creation of the Intergovernmental Working Group, lobbying for the support and co-sponsorship of the draft resolution.[59] Bolivia led the process of negotiations of the Declaration by chairing the Working Group, proposing the resolutions and the different versions of the negotiating document, as well as conducting several informal bilateral and regional consultations during the whole process.[60] After the success at the Human Rights Council, Bolivia, with the co-sponsorship of 44 countries, introduced the resolution to adopt the Declaration at UN General Assembly, ultimately leading to the adoption of UNDROP by obtaining 121 votes in favour.[61] A team of the International Secretariat of FIAN working on the rights of peasants comments on Bolivia's contribution, *'A quite marginal and small state in the geopolitical landscape bravely decided to negotiate the Declaration text… Bolivia defied the normal rules applied in the [UN Human Rights] Council and, as Chair of the Working Group, opened up space for more participation and democracy.'*[62] Gradoni and Pasquet note that the making of UNDROP which involved leadership of like-minded states by Bolivia and collaborations with non-governmental organisations and academic institutions realized a counter-hegemonic international law-making modality identified by Rajagopal. [63]

A Bolivian diplomat involved in negotiation of UNDROP, argues that the declaration contributes *'to the decolonization of the international human rights system ... its vision of*

[56] WTO, Minutes of Meeting (Council for Trade-Related Aspects of Intellectual Property Rights) IP/C/M/89/Add.1. 13 September 2018' (2018), para 90.
[57] Plahe and others (n 50), 291.
[58] ibid, 313.
[59] MN Pacheco Rodriguez and LF Rosales Lozada, 'The United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas: One Step Forward in the Promotion of Human Rights for the Most Vulnerable' (2020) 123 *The International Social Science Journal* 123, 3-10.
[60] ibid, 10-11.
[61] ibid, 28-29.
[62] Quoted in P Claeys and M Edelman, 'The United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas' (2020) 47(1) *The Journal of Peasant Studies* 1, 29
[63] L Gradoni and L Pasquet, 'Voice under Domination: Notes on the Making and Significance of the United Nations Declaration on the Rights of Peasants' (2022) 33 *European Journal of International Law* 315, 42; B Rajagopal, 'Counter-Hegemonic International Law: Rethinking Human Rights and Development as a Third World Strategy' (2006) 27 *Third World Quarterly* 767, 781.

human rights embraces not only individual civil rights, but also collective rights, both civil and political as well as economic, social and cultural rights. These include human rights to land and seeds, showing the human being's dependence on Mother Earth... the Declaration incorporates unconventional concepts and notions, such as food sovereignty, which reflect a much broader and decolonizing narrative.'[64] Bolivia has also played an active role in the adoption of the UN Declaration on the Rights of Indigenous Peoples in 2007.[65] It also became the first country to adopt the Declaration into law,[66] doing so in less than two months after its adoption by the UN, and later embedding the rights in its Constitution.

4. Acquiescence to modification and commodification of seeds?

As we have observed, Bolivia has assumed leadership in international forums as an advocate of the non-commodification of genetic resources, the promotion of the rights of peasants and the Andean philosophy of *vivir bien.* While Bolivia does not allow the patent law to cover plants or any life form, it has adopted a PVP law, which is an offshoot of patent law.[67] PVP law splits the control of plants asunder, *capacity to produce yield* and *capacity to produce others of its kind* and commodifies the latter by creating an exchange value of its own.[68]

The Secretariat Resolution No. 064/96 of 9 August 1996 which outlined rules for seed certification and inspection, also included provisions on PVP, referring to Decision No. 345 of the Andean Community of Nations to protect plant varieties (Art. 15). After ratifying the 1978 version of the International Union for the Protection of New Varieties of Plants (UPOV) Convention in 1999[69], Bolivia adopted the Regulations on Protection of Plant Varieties 2001[70], issued as a ministerial resolution outlining its regime for plant breeders' rights. In addition to accession to the UPOV, the 2001 regulation refers to Bolivia's obligations under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the Decision 345 of the Andean Community.[71]The Decision 345 created a regime of PVP protection for the Andean Community based on the essential elements of UPOV 1991.[72] Ignoring the possibility of developing a *sui generis* regime of PVP protection, the Decision 345 limits the PVP rights to the creation of new varieties by application of 'scientific skills to the genetic improvement of plants' (Art 4), excluding the plant varieties obtained through traditional innovation or farmers' innovation.[73] The same is reflected in Bolivia's PVP legislation. UPOV notes that although

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[64] María Natalia Pacheco Rodríguez quoted in Claeys & Edelman (n 57), 35.
[65] UNGA, United Nations Declaration on the Rights of Indigenous Peoples, UN Doc. GA Res 61/295, 13 September 2007; See United Nations General Assembly, 'Third Committee Approves Draft Resolution on Right to Development; Votes to Defer Action Concerning Declaration on Indigenous Peoples GA/SHC/3878 28 November 2006,https://www.un.org/press/en/2006/gashc3878.doc.htm
[66] Law 3760
[67] A Heitz, 'The History of Plant Variety Protection' in UPOV (ed), *The First Twenty-Five Years of the International Convention for the Protection of New Plant Varieties* (UPOV 1987), 54.
[68] A Alexandra and A Walsh, 'Exclusion, Commodification and Plant Variety Rights Legislation' (1997) 14 *Agriculture and Human Values* 313, 317-318.
[69] Accession through the law no 1968 of 24 March 1999.
[70] The regulation was issued as Ministerial Resolution No. 040 of April 2, 2001.
[71] Mentioned in the regulation on protection of plant varieties 2001, art 1.
[72] G Nemogá, 'Indigenous Agrobiodiversity and Governance' in Karl S Zimmerer and Stef De Haan (eds), *Agrobiodiversity: Integrating Knowledge for a Sustainable Future* (The MIT Press 2019), 258; UPOV, *Introduction to the International Union for the Protection of New Varieties of Plants* (UPOV 2004), 18, para 86.
[73] ibid, 258.

Bolivia has chosen to only accede to the 1978 version of the UPOV Convention, its law is in line with the UPOV Convention 1991.[74]

The Regulations on Protection of Plant Varieties 2001 of Bolivia grants PVP right to a plant breeder for a plant variety that is novel, distinct, uniform, and stable (Art. 11). The PVP right allows a breeder to prevent others from carrying out activities relating to the reproduction, propagation, and sale of the protected variety.[75] It also extends breeders' rights to the Essentially Derived Varieties (EDVs), a concept introduced by UPOV 1991 and incorporated in the Decision 345.[76] The breeder's rights are extended for the purchase, sale or use of grain, or any other harvested product, for sowing purposes.[77] The right lasts twenty-five years for vines, forest and fruit trees and twenty years for other species.[78] Infringement is punishable through a fine or confiscation of seeds (Art. 66).

Most of the PVP registration is done in the Santa Cruz department of Instituto Nacional de Innovation Agropecuria y Forestal (INIAF).[79] The National Register of Varieties and Protected Varieties reports, as of 30 June 2023, 60 varieties are currently protected under PVP law, 40 of which are soybean varieties.[80] This accounts for 66% of the total, making soybeans the dominant group among the protected varieties. While the register of protected varieties does not indicate whether the varieties are genetically modified, the Registration Control Officer of INIAF Santa Cruz stated that all the currently protected soybean varieites are genitically modified.[81] She clarified that while non-GM varieties were registered under PVP law, they

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[74] UPOV, *Introduction to the International Union for the Protection of New Varieties of Plants* (UPOV 2004), 18, para 86.

[75] Article 32 of the Regulation on protection of plant varieties specifies the ownership of the PVP rights confers right to prevent others from carrying out (a) Production, reproduction, multiplication or propagation; (b) Conditioning for reproduction, multiplication or propagation purposes; (c) Offer for sale; (d) Sale or any other act which involves the introduction into the market of the reproduction, propagation or multiplication material for commercial purposes; (e) Export; (f) Import; (g) Possession for any of the purposes mentioned above; (h) Commercial use of ornamental and fruit plants or parts thereof as multiplication material; (i) The performance of abovementioned acts in relation to the harvested material.

[76] Regulation on protection of plant varieties, art 33, 34.; While UPOV 1978, which Bolivia is party to, does not have provision on EDV. The concept of EDV was introduced by UPOV 1991, and incorporated in the Decision 345 of the Andean Community of Nations (Art 24). Art 3 of PVP law extends the coverage to all plant genus and species.

[77] Article 37. Extension.

(I)A new reproduction, multiplication or propagation of the protected variety;

(II)Export of the material of the protected variety, allowing the variety to be reproduced, to a country which does not grant protection for the varieties of the plant species to which the exported variety belongs, apart from where said material is intended for human or animal consumption, or industry.

(III)The purchase, sale or use of grain, or any other harvested product, for sowing purposes shall be regarded as acts performed with reproduction or multiplication material under Article 24 of Decision No. 345 of the Andean Community of Nations (formerly JUNAC)

[78] See Art 40; Under article 41, the regulation grants provisional protection during the period from the filing of the application to the grant of the Ownership Title. An action for damages may only be taken once the Ownership Title has been granted, but may cover the damage caused by the respondent after the filing date.

[79] According to the National Register of Varieties and Protected Varieties 2023, 48 out of total 54 currently protected varieites are registered by the Santa Cruz department of INIAF. The remaining six registration were done in Beni and La Paz department of INIAF. Besides, all of the soybean varieties have been exclusively registered in the Santa Cruz department See INIAF, *Registro Nactional De Variedades Y De Variedades Protegidas* (INIAF 2023), 52-53.

[80] The total number includs six varieties with provisional protection, of which four are soybean varieties. See ibid.

[81] Registration Control Officer, INIAF Santa Cruz, interviewed on 07 July 2021 at INIAF Santa Cruz Office, Bolivia.

were not renewed by the right holder, and therefore are not in the list of currently protected varieties anymore. For instance, previously even a farmer had successfully registered such non-GM variety named Cachete-02 but it was not renewed because of decrease in demand.[82] Currently more than 98% of the soybeans planted in Bolivia are genetically modified.[83] Varieites like Munasqa and SE-4863 are popular GM soybean varieites which are listed as currently protected varieties in the national register.[84]

Glyphosate-resistant GM soybean was legalized in Bolivia in 2005 (Supreme Decree 28225), but it was first introduced illegally in the mid-1990s, allegedly by agribusiness, who sought to legalize it later.[85] Several civil society groups criticized the legalization through a decree rather than a regular legal procedure;[86] however, the decree remains in force. With the switch from conventional to GM soybean, the soybean plantation in Bolivia increased up to more than 1.2 million hectares in 2017, compared to just 200 thousand hectares in 1990.[87]

Although the proponents of GM seeds suggest that farmers can buy GM seeds from any seed-selling outlet and exercise their choice, there are only a few players that dominate the market. Only four companies (ADM, Cargill, FINO and Gravetal) control 86% of the GM seed distribution market in the country. [88] As such, there is a 'a very marked dependence' on these companies for the soybean seeds.[89] Monopoly of agrochemical is no longer a big concern as there is growing supply of agrochemical from China– however, the environmental concerns remain. [90]

Around 78% of soybean producers in Santa Cruz region are smallholder farmers who possess 50 hectares or less land. [91] The following section will discuss these farmers' experience in farming GM soybean and their rights of seeds saving and exchanging seeds recognized by the PVP law.

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[82] Registration Control Officer, INIAF Santa Cruz, interviewed on 07 July 2021 at INIAF Santa Cruz Office, Bolivia.

[83] IBCE, *Impacto Socioeconómico y Medioambiental en Bolivia a Partir de la Soya y Maíz Genéticamente Mejorados* (2016), 6.

[84] See A Bessa and K Veiga, 'El Orden Jurídico y Las Dinámicas Socioeconómicas de Las Semillas En Sistemas Alimentares de Santa Cruz de La Sierra, Bolivia' (2020) Working Paper No. 9, 59; Confirming the popularity Munasqa soybean variety, the Director of *Asociación Nacional de Productores de Oleaginosas y Trigo* (ANAPO) (National Association of Oilseed and Wheat Producers) also stated that the variety has led to collection of good amount of royalty. Interviewed on 06 July 2021 at ANAPO, Santa Cruz, Bolivia; Also see the national INIAF 2023 (n 79); For the further details about Munasqa variety see M Villca Lopez and others, 'Validación de dos variedades de soya (Glycine max (L) Merril) en la comunidad de Chane 1: Campaña de invierno 2013' (2014) *Universidad, Ciencia y Sociedad* 35.

[85] M Høiby and JZ Hopp, 'Bolivia: Emerging and Traditional Elites and the Governance of the Soy Sector' in Benedicte Bull and Mariel Aguilar-Støen (eds), *Environmental Politics in Latin America* (1st edn, Routledge 2015), 60.

[86] ibid

[87] Acción por la Biodiversidad, *Atlas del Agronegocio Transgénico en el Cono Sur: Monocultivos, Resistencias y Propuestas de los Pueblos* (Acción por la Biodiversidad 2020), 15.

[88] INIAF 2015 cited in Acción por la Biodiversidad (n 77), 73.

[89] Director of Eastern Region, Tierra Foundation Interviewed on 07 July 2021 at Office of Tierra Foundation, Satna Cruz, Bolivia.

[90] Ibid.

[91] Acción por la Biodiversidad (n 87) 51; As of 2011, these 78% of farmers controlled only 9% of the land producing soybean, while 2% of large-scale soybean producers controlling 71% of the soybean producing land; B McKay, 'The Politics of Control: New Dynamics of Agrarian Change in Bolivia's Soy Complex' (Doctoral Degree Thesis, Erasmus University Rotterdam 2017), 134.

4.1. Farmers' difficulty to save and exchange seeds:

The Bolivian PVP system allows the use of the protected variety for non-commercial or experimental purposes, allowing exemptions for researchers, breeders, and farmers. Article 36 of the PVP regulation has detailed provision conditioning the farmers' right to use the protected seeds. Farmers with an agricultural holding equal to or less than 200 hectares are allowed to save seeds of the protected variety for use on their own holding with the following cultivation:100 hectares for soya, wheat, maize, sorghum, sunflower or cotton; 50 hectares for rice and 20 hectares for other species. Hoverer, they cannot sell the seeds, exchange or give them as gifts. If they do, their seeds can be seized, and they can be fined.

The farmers planting the PVP protected soybean buy the seeds from an authorized seed company dealer with cash or on a credit agreement. Any farmer with more than 200 hectares of land must pay a royalty to the seed company. They cannot multiply the seed but can only sell the harvest as a final product. The manager of FUNDACRUZ summarized, '*The farmer who has more than 200 hectares in his property has to pay a royalty for his own use, the small farmer who has a land of 200 hectares or less does not pay royalty unless he wants to multiply the seed to sell*.'[92] Currently, FUNDACRUZ has six soybean varieties (eg FCZ TRUENO RG, TMG 7363 RR) protected under PVP law.[93] If the smallholder farmers do not intend to multiply the seeds, meaning to sell or exchange the harvest as seeds, they only pay the price of the seeds. However, the seed companies collect royalties from any farmer who decides to produce seeds. Any farmer who plants one of the protected varieties in order to multiply seed has to recognize the royalty.[94] If a farmer wants to sell seeds, the field where they intend to plant the soybean for seed multiplication must be registered with INIAF. Once the field is registered, INIAF asks for permission from the owner (the company) of the variety, and if the owner agrees, they initiate the necessary procedure of signing a contract between the company and the seed-growing farmer. As the company issues an exploitation license, the farmer pays 50% of the estimated value of the expected harvest in advance and assumes the cost of plantation, storage and harvesting.

After the process of exploitation license and the contract is completed, a farmer can start seed production. When the harvest is ready, INIAF indicates the amount of the seed certified and based on which seed companies charge the farmers the remaining amount of royalty, which is usually around 280BS per ton.[95] The exploitation license is also controlled in processing plants where the seeds are processed before storage.[96] If the farmers do not have the

[92] Manager, FUNDACRUZ, interviewed on 07 July 2021 at FUNDACRUZ office, Santa Cruz, Bolivia.
[93] INIAF (n 79), 52-53.
[94] Interviewed on 07 July 2021 at FUNDACRUZ office, Santa Cruz, Bolivia.
[95] FUNDACRUZ charges 280BS per ton of seed produced. 'For example, if the seed grower registered 50 hectares with INIAF, we estimate an average of how much seed he will produce on that land. If it were 50 hectares, he could harvest about 60 tons, we would multiply in that case 60x280BS, which would make a total of 16,800BS. Of this estimated amount we charge 50% as a guarantee, which would be 8400 BS, which is what they pay us as a guarantee...Once the seed grower already has his harvest, let's say he harvested 70 tons of seed, then in that case if we multiply 70x280bs, that would be a total of 19,600 Bolivianos. Of that amount, he has already left us 8400BSas a guarantee, so he only has to pay the difference, that is, the remaining amount, which would be 11,200 bolivianos.' Interviewed on 07 July 2021 at FUNDACRUZ office, Santa Cruz, Bolivia.
[96]Director, ANAPO Interviewed on 06 July at Asociación *Nacional de Productores de Oleaginosas y Trigo* (National Association of Oilseed and Wheat Producers (ANAPO), Santa Cruz, Bolivia

license or permission to use the variety for seed multiplication, the INIAF retains and confiscates their seeds.[97]

While the smallholders do not need to pay royalties for plantation of GM soybean, they are entitled to save seeds for their own use if they do not involve in selling of those seeds. In the case of soybean, the Bolivian PVP regulation allows smallholder farmers who hold less than 200 hectares to save seeds of the protected variety for their own use if they cultivate soybean on less than 100 hectares (Art.36). Therefore, the smallholder farmers are allowed to save the seeds and plant for the next season as many times as they want, under farmers' exemption, locally referred to as *bolsa blanca* (white bag). A farmer (001) in Cuatro Cañada stated, '*If they are large plantations, they generally buy [seeds] from companies/ suppliers, but there are also some [farmers] who produce their own seed when their plantation is not very large*.'[98]

However, not many smallholders save seeds even if they are legally permitted to. According to the president of the *Cámara Agropecuaria de Pequeños Productores del Oriente* (CAPPO) (Agricultural Chamber of Small Farmers/Producers of Orient), in their estimation, only around 25-30% of the farmers save/exchange soybean seeds or buy in the informal market, although it is a cheaper option.[99] The rest, around 70% of the farmers, he suggests, purchase soybean seeds in the formal market.[100] The reason for this, he explained, is the cost associated with saving seeds. Saving soybean seeds requires some investment, for instance, equipment like a harvester, processing machine, storage facility and technical knowledge. He shared, '*The seeds cannot be harvested and sown directly...There may be larger or smaller grains, which is not good for sowing. They have to select standard seeds. And farmers do not have the processing machine... There are specific conditions to store the seeds. They cannot be stored in a regular bag. It has to be done in a closed, proper environment…If you sow the seed that was stored in bad conditions, it may not germinate, or the crop may be damaged or weak… It is difficult because small farmers need money and training to be able to save good seeds. They need a machine with the latest technology so that it does not damage it when harvesting. They need a good seed processing machine so that they get a good number of seeds. And this is the cost just to save the seed*.'[101] A local scientist working in the GM Soybean sector stated that it is not easy for farmers '*to distinguish if it is good quality and certifiable seed.'*.[102]

Although the PVP regulation forbids farmers to sell or exchange the protected seeds, the soybean seeds are available in informal market at cheaper rates. But generally, farmers are apprehensive about the quality of farm saved soybean seeds available in the informal market. They are concerned that the poor-quality seeds may lead to crop failure and economic loss. The CAPPO's president stated, *'Now about the seed produced and exchanged between farmers, it*

[97] Registration Control Officer, INIAF Santa Cruz, interviewed on 07 July 2021 at INIAF Santa Cruz Office, Bolivia.
[98] Farmer 001, interviewed on 08 July 2021 in Cuatro Cañada, Bolivia.
[99] Interviewed on 06 July 2021 in Santa Cruz, Bolivia.
[100] This figure was also corroborated by Director of ANAPO. He said, 'We had 70% of certified seed in Bolivia that respected the use of intellectual property and there are 30% that were contraband or white bags; but for the most part it [intellectual property] is respected.' Interviewed on 06 July 2021 at ANAPO office, Santa Cruz, Bolivia.
[101] Interviewed on 06 July 2021 in Santa Cruz, Bolivia.
[102] Biotechnologist, IGEM Bolivia, interviewed on 25 June 2021, online.

can be the same [as bought from seed companies], or sometimes it can be bad. Since the product may not be the same [quality as seed companies] and it may not produce the same. It may be damaged by bugs. It may happen that if I put ten grains and only five germinate, that can cause damage to my yield and can cause a big economic loss.…There is a lot of difference [between certified and uncertified seeds], because the certified seed tells you that if you put ten grains of seed in the soil, it guarantees that nine will germinate. It also guarantees the health and the size of the seed.'[103]

One of the constraints for smallholder farmers to save their own seed is the rapid deterioration of the seed after harvest. Therefore, even when they manage to save seeds, it can be used for a couple of seasons and again they need to buy from the company.[104] However, the CAPPO's president believes that with the right machinery for harvesting and processing, farmers can get good quality seeds themselves, and some smallholder farmers are learning and making investments to save soybean seeds of good quality. Even the smallholders use different tricks to save seeds, and they are sometimes successful. For instance, regarding the saving of soybean seeds to use for next season, a farmer (002) shared, *'It has to be kept in the dark; it has to have air and ventilation. That is why I kept it in my shed so that it would also get wind. I kept it in August until the end of November we store it for planting. It has to be stored for four months.'*[105] In principle, there is no prohibition in saving seeds, but due to the cost and technical knowledge involved, it is not always practical to save seeds. The farmers who save their seed do so through some government program or they join some cooperatives to have the resource and machinery needed to save seed.[106] The risk of bad harvest using uncertified seeds of unknown quality also discourages large producers from trying to save and reuse the soybean seeds.[107]

The Director of *Asociación Nacional de Productores de Oleaginosas y Trigo* (ANAPO) (National Association of Oilseed and Wheat Producers) (small as well as medium), believes that the farmers are more and more aware and are willing to pay for the high-quality seeds. '*They are willing to pay more for the quality of the seed because, in seed of 100 grains, 95 will germinate. And they also come with a strong vigour... If it does not have vigour, when it rains, the stem bends and does not grow; this does not happen with Argentine seed that we are importing*.'[108]

While purchasing the seeds, the seed selling companies inform the farmers that they need to plant certified seeds to produce a better harvest. A farmer (001) stated, '*The first thing is that companies inform the farmers that they have to plant certified seeds to produce a better harvest.'*[109] She further said*, 'They inform me of all the studies and characteristics of the soybean; if it is genetically modified, I know that it is no good for me to plant again; if I plant it again, the production will not be the same as it was in the first season.'* The Association of Seed Producers (Asosemillas) also actively promotes the use of certified seeds and discourages

[103] Interviewed on 06 July 2021 in Santa Cruz, Bolivia.
[104] Bessa and Veiga (n 84), 59.
[105] Farmer 002, interviewed on 08 July 2021 in Cuatro Cañada, Bolivia
[106] Shared by President of CAPPO, interviewed on 06 July 2021 in Santa Cruz, Bolivia.
[107] Plant breeder, Gabriel Rene Moreno University, interviewed on 05 July at Gabriel Rene Moreno University, Santa Cruz, Bolivia.
[108] Interviewed on 06 July 2021 at ANAPO, Santa Cruz, Bolivia.
[109] Farmer 001, interviewed on 08 July 2021 in Cuatro Cañada, Bolivia.

seed saving and seed piracy through different mediums, including social media.[110] The Asosemillas shared their concerns with CAPPO because farmers are now training, learning and making necessary arrangements to save seeds for next season.[111] CAPPO is also working on projects to have a seed processing centre, storage centre and required products to treat the seed to enable its members to save their own seeds.[112]

The President of CAPPO further stated that the problems with smallholders have been that they do not have access to seed production, technical assistance, nor direct access to agrochemicals. After the formation of organizations like CAPPO, and other small farmer organizations, they have been working to obtain better prices for seeds and agrochemicals. '*CAPPO was born to promote the use and production of our own seed, now there is exchange and sale of seed between producers, for example, in the northern zone, they produce seed in winter for us (east) to sow in summer and, also we sell to the north in winter. So, we have that experience, but it is not applied 100% because we have to know how to manage the technical and agronomic part with insecticides and agrochemicals*.'[113]

Thus, in highly mechanised farming, mere exemption to save seeds does not necessarily transform in farmers exercising those rights. Without adequate support to access seeds and necessary equipment, smallholders may be pushed out of the farming altogether, as discussed in the following section.

4.2. From expensive seeds to land renting:

As stated above, farmers can purchase seeds from any authorized seed seller, and there is no contract or licence as long as they use the seed in their own holding and do not sell the harvest as seed. However, things get complex as they enter into a credit contract. The highly mechanized soybean farming in Bolivia means that along with GM seeds and agrochemicals, it requires access to heavy machinery such as a tractor, sower, harvester, fumigator, and transport truck, which smallholder farmers often lack.[114] Furthermore, while a tonne of soybeans costs around $320, a tonne of soybean seed can cost up to $700.[115] The estimated total cost of production for soybean cultivation (excluding the rent for machinery) is around USD 464 per hectare. [116]Around 80 to 85% of producers are small-scale farmers[117] and they usually need credit to continue soybean cultivation.[118]

The Bolivian law does not allow farmers with less than 50 hectares of land to use their land as collateral for credit. Although the law intends to protect smallholder's land[119] a

[110]Facebook page of Asosemillas, published on 03 Dec 2021, available at https://www.facebook.com/productoresdesemillas/posts/415487056889306 (Accessed on 10 Feb 2023).
[111] President, CAPPO, interviewed on 06 July 2021 in Santa Cruz, Bolivia.
[112] Ibid.
[113] Ibid.
[114] McKay (n 91), 135.
[115] Bessa and Veiga (n 84).
[116] McKay (n 91),136.
[117] JM Canelas Schutt, 'Contract Farming in Bolivia: An Overview of Law and Practice' (2012), 17
[118] G Catacora-Vargas, 'Soya in Bolivia: Dependency and the Production of Oleaginous Crops' in Javiera Rulli (ed), *United Soy Republics: Realities about Soya Production in South America* (GRR 2007).
[119] Researcher, Bolivia Catholic University, interviewed on 21 September 2022 in New Delhi, India.

ramification of this provision is that farmers cannot get credit from financial institutions.[120] Therefore, farmers usually enter credit contracts with the seed or soybean processing company.[121] '*The seller with whom they [farmers] buy the soybeans [seeds] can ask for a small payment and give the rest with credit. The same happens with the agrochemicals that they can also give you credit and all this you have to pay with the guarantee of your production.*'[122]

Such a contract requires that the produced soybean must be of the best quality, and the risks of crop losses arising from unforeseeable circumstances shall be borne exclusively by the sellers, meaning the farmers. Companies usually provide seeds and inputs as well. The provision in the contract states the companies do advance payments in the form of agricultural input, including from third-party suppliers.[123] It usually means the seed is supplied through the credit-giving company as a part of a bigger package. Therefore, although purchasing seeds does not require a contract, once the farmers enter credit relation with the seed or soybean processing companies, seed and other input needs to be purchased through their mechanism, ultimately limiting any possibility of manoeuvring by farmers in terms of saving or exchanging seeds. And the majority of farmers who cultivate soybean usually enter into credit contracts.[124]

While access to credit is essential to continued participation in soybean cultivation, entering a credit contract is not risk-free. Farmers have had trouble getting out of debt. One significant factor contributing to debt of smallholders is the bad harvest due to dry weather[125] other is when the price of soybean drops[126] '*They acquire debts for seeds, agrochemicals and machinery, and they have to pay with the profit of each harvest.*'[127] Even in years when the weather turns favourable, the profit margin on a typical plot of land is basically enough to cover the credit and the household's basic needs, without generating significant savings.[128]

The above discussed farmers who enter into credit relation to produce soybean, loosely form a category of within the smallholder farmers, who continue to stay in soybean production. There is another category of smallholders in Bolivia, who being cautious towards getting into debt have started to rent their land to bigger producers. This can be explained in a statement of a farmer: *'The first time we tried to plant on our own we did not have the machines to plant and harvest. It was very difficult because we had to buy the seed, the chemicals and rent the machines, pay a technician to advise us; it was a big investment ...[but] the harvest was bad and ... not enough to pay the debt we acquired... The second time ... same thing happened, we had to get more seed on credit and the agrochemical also... The third time we tried to plant, the harvest was good... we thought that we were going to pay the debt but it was not even*

[120] Director of Eastern Region, Tierra Foundation Interviewed on 07 July 2021 at Office of Tierra Foundation, Satna Cruz, Bolivia; Canelas Schutt (n 117), 17.
[121] Researcher, Bolivia Catholic University, interviewed on 21 September 2022 in New Delhi, India.
[122] Director of Eastern Region, Tierra Foundation Interviewed on 07 July 2021 at Office of Tierra Foundation, Satna Cruz, Bolivia.
[123] See Sample contract in Canelas Schutt (n 117).
[124] Catacora-Vargas (n 118).
[125] Environmental biotechnologist, IGEM Bolivia, Interviewed on 25 June 2021 (Online)
[126] Director of Eastern Region, Tierra Foundation Interviewed on 07 July 2021 at Office of Tierra Foundation, Satna Cruz, Bolivia.
[127] Ibid.
[128] E Castañón Ballivián, 'Discurso Empresarial vs. Realidad Campesina: La Ecología Política de La Producción de Soya en Santa Cruz, Bolivia' (2015) 2 *Cuestión Agraria* 65, 78.

enough, that is why we decided to start renting [out our land] as we could not pay the debts ... now we are not worried about the machines or the seed or the companies...Besides, those who rent from us already have machinery, which is the most expensive thing.'[129]

This trend of smallholders renting out their land to medium/bigger producers has already been documented in some studies. Castañón Ballivián states that although some families opt for credit to access the technological package for soybean production, most prefer to rent their land to other bigger producers who have the necessary capital.[130] Similarly, McKay also found that to avoid debt altogether, smallholder farmers usually rent out their land to other farmers, who might enter into contract farming with the agroindustry.[131] This caution towards credit seems to be based on negative experiences of former families who ended up selling their farms and migrating due to their indebtedness.[132] Since these smallholders rent their land and are not involved in farming, the exemption for seed saving in the case of soybean is practically non-relevant for them. The lack of capital excludes them from the agro-industrial dynamic altogether, as soybean cultivation is a viable option for only a minority of farmers because it requires significant amounts of land and capital that are beyond the reach of the vast majority of the region's smallholder farmers.[133]

Soybean farmers in the Santa Cruz region of Bolivia, therefore, rely primarily on the formal sector to purchase their seeds for various reasons discussed above. While industrial crop like the GM soybean is rewarded with PVP rights, the smallholders struggle to exercise some bargained exemption to save seeds in the capital-intensive model. As such, merely declaring an exemption to save seeds is not adequate for farmers to maintain their ownership of seeds. They require further assistance to be able to exercise the legally recognized right to save seeds, and, ultimately, to be able to stay in soybean farming. Seed is just one yet fundamental component of the complex agro-industrial soybean farming.

This should be viewed from the perspective that the social cost of GM soybean plantation is much more than mere seeds, inputs and harvest. When one farmer decides to use a GM package, the crops of neighbouring fields are affected by the herbicide, as such, it requires farmers to come to an agreement with a neighbouring farmer to plant GM soybean, convincing them to use the GM package as well. Therefore, planting other crops in the neighbouring is not really an option when farmers have small plots of land and the herbicide from neighbouring fields can easily reach, especially during rainy days.[134] It also has impact on the choices of farmers ranging from whether to keep cattle, whether to rent out the land and so on.[135]

Therefore, the smallholders cannot stay out of the soybean system when most of the neighbours decide to plant GM soybean. Since soybean cultivation requires access to capital, the smallholder farmers rent their land to the bigger producers who have access to more capital. The smallholders cannot adequately exercise their right to save seeds for these various reasons, rather they stop involvement in direct farming.

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[129] Interview, Farmer 003 Interviewed on 08 July 2021 in Cuatro Cañada, Bolivia.
[130] Castañón Ballivián (n 128), 80.
[131] McKay (n 91), 135.
[132] Castañón Ballivián (n 128), 80.
[133] ibid, 83.
[134] Farmer 001, 002 interviewed on 08 July 2021 in Cuatro Cañada, Bolivia; This was also stated by Environmental biotechnologist of IGEM Bolivia and CAPPO's president.
[135]Farmer 001, 002, Interviewed on 08 July 2021 in Cuatro Cañada, Bolivia.

5. The influential agro-industrial sector:

As discussed above, the prevalent soybean farming model is not friendly towards farmers' ownership of seeds, although the law has some flexibility. The concerns of soybean farming not leading to the promised benefits have also been pointed out in other studies.[136] While Bolivia has a remarkable legal framework based on *vivir bien,* which rejects genetic modification and commodification of seeds, the situation of farmers' dealing with GM seeds shows the *de facto* commodification and farmers' dispossession of seeds. The farmers do not have control over the soybean seeds in terms of saving and exchanging. Instead, they depend on the agro-industrial sector for seeds and agricultural inputs. Furthermore, the GM soybean package has also been a cause of debt, ultimately pushing farmers out of the production system. The continued cultivation of GM seeds and the worsening situation of smallholder farmers, in the case of Bolivia, is particularly interesting when seen in comparison with its successful promotion of the rights of farmers and resisting commodification of seeds in different international forums.

It is, however, important to note that both the PVP law and legalization of GM soybean in Bolivia, which remain in force, came during the neoliberal government before the rhetoric of *vivir bien* and the rights of mother earth became the official agenda of the government. After the Movimiento al Socialismo (MAS) came to power in 2005, it attempted to curve the dependence of soybean farmers on the agroindustry. To support smallholder soybean farmers, encourage the production of conventional soybean and reduce their dependence on agricultural companies, the government established a state-owned Company for the Support of Food Production (EMAPA). However, cultivating conventional soybean turned out to be difficult due to competition with GM soybean.[137] EMAPA was also unable to deliver credits and supplies on time, which caused losses for farmers and created distrust among small farmers in the market for conventional soybean.[138]

In the early days of the MAS government, there was no new approval of GM seeds. Rather, as discussed above in section 2, the rights of mother earth, non-commodification of genetic resources and gradual elimination of GMO took the central stage. During this time, Bolivia adopted many laws favourable to smallholder farmers.[139] In line with the above-discussed ideological orientations, Evo Morales attempted to reverse Bolivia's permissive stance towards

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[136] Castañón Ballivián (n 128); McKay (n 91).

[137] M Høiby and JZ Hopp, 'Bolivia: Emerging and Traditional Elites and the Governance of the Soy Sector' in Benedicte Bull and Mariel Aguilar-Støen (eds), *Environmental Politics in Latin America* (1st edn, Routledge 2015), 60–61.

[138] Ibid; For the government's effort to promote conventional soybean also see Bessa & Veiha (n 94), 46; M Smale and others, 'A Case of Resistance: Herbicide-Tolerant Soybeans in Bolivia' (2012) 15 *AgBioForum* 191

[139] The law on the community agricultural and livestock production revolution enacted in 2011 aims to achieve food sovereignty in terms of safety and quality for the *vivir bien* (living well) of the Bolivians (Art. 3, Law 144). It seeks to prioritise organic production in harmony and balance with the mother earth (Article 2, Law 144). The law also recognises indigenous native peasant communities as 'Community Economic Organisation' (Art. 5(2), Law 144). More laws supporting organic production and agricultural insurance were adopted. Acción por la Biodiversidad (n 77), 111.

GM crops, but he could not succeed.[140] Laws were adopted restricting the introduction of any agricultural technology packages involving GM seeds of the species of which Bolivia is the centre of 'origin' or 'diversity', or those that threaten the genetic heritage, biodiversity, health of life systems and human health.[141] Therefore, while the law prohibits introduction of GM seeds, this prohibition is only for the species that are native to Bolivia, thus, exempting soybean, which is not native to Bolivia. However, Art 24(8) law 300 Mother Earth of 2012 explicitly obliges the government to take actions to gradually eliminate the cultivation of genetically modified organisms authorized in the country. This would include GM soybean, the only authorized GM crop. This led to protests from the agro-industrial sector demanding modifications of the law.[142] The law remained unchanged; however, the proponent of GMO began providing different interpretations to argue otherwise. For instance, ANAPO points that the Law No. 300 provides for the gradual elimination of GMO, but there is no specific regulation on the conditions and deadlines for this elimination. It further argues that the provision violates Article 343 of the constitution, which recognizes the right of people to to participate in environmental management.[143]

After 2015, a series of legislations favouring the agro-industrial sector began to emerge in Bolivia, for instance, facilitating deforestation (Law 739 of 2015), authorizing land clearance to expand agricultural production (Law 741 of 2015).[144] The *Cumbre Agropecuaria Sembrando Bolivia,* an agricultural summit held in 2015 to address the agricultural issues and long-term productive agendas, turned out to be an occasion for successfully pushing the agro-industrial agenda.[145] The agro-industrial sector succeeded in including the GMO issue in the summit, as it overturned what had been achieved through the Laws 144 and 300 and reopened the debate and options for use and legalization of GMO.[146] Consequently, the government brought several laws facilitating agro-industrial sector, one notable being the Supreme Decree 2452 of 2015, which requires labelling of products containing GMO, and practically legalizes the production, manufacture, importation, and marketing of foodstuff containing GMO. Soliz Tito argues that although the law ostensibly protects consumers through the labelling requirement, the real motive is to allow and legalize the production, import and marketing of foods that are or contain GMOs.[147] In 2019 the MAS government led by Evo Morales authorized to establish abbreviated procedures for the evaluation of two newer GM soybean events, HB4 and Intact, for the production of Biodiesel.[148]

The agro-industrial sector in Bolivia has been successfully updating its discourse on GM soybean in synchronization with the political stand of the government. After the MAS government came to power, the soybean sector legitimized the GM soybean by successfully arguing its importance for food security and the opportunity it provides for the smallholder

[140] E Dargent and M Urteaga, 'The Power of the Seed: Timing, Quick Structural Change, and Genetically Modified Crop Regulations in the Andes' (2019) 51 *Comparative Politics* 539, 552.
[141] Art. 15(2), Law 144; Art. 24(7), Law 300
[142] Ibid, 553.
[143] ANAPO, *Memoria Anual 2022* (2022), 34.
[144] Acción por la Biodiversidad (n 77), 106,
[145] L Soliz Tito, *Cumbre Agropecuaria "Sembrando Bolivia": Resultados, Ecos y Primeros Pasos Hacia su Implementación* (Centro de Investigación y Promoción del Campesinado (CIPCA) 2015.
[146] ibid, 35.
[147] ibid, 45–48.
[148] Supreme Decree 3874.

farmers.[149] This is manifested in Morales ironically suggesting that GM soybean plantation contributes to attain food security in Bolivia,[150] ultimately weakening the actual meaning of 'food sovereignty' by making it an umbrella for all agricultural development, including the production of GM soybean.[151] Despite the marketing strategy of the agro-industrial sector, GM soybean does not actually contribute to food security or food sovereignty in Bolivia.[152] Rather, the small and indigenous farming sector contributes significantly to the food supply.[153]

Similarly, in 2020, the interim government, led by Jeanine Añez had introduced decrees facilitating the cultivation of GMO, again citing food sovereignty. The Supreme Decree 4232, for the constitutional objectives of Bolivia to guarantee food sovereignty and emergency response to the outbreak of COVID-19, exceptionally authorized the National Biosafety Committee to establish abbreviated procedures for the evaluation of GM maize, sugar cane, cotton, wheat and soya, in their different events. Similarly, the Supreme Decree 4348 provided for identification of areas for the cultivation of GM corn. However, the government led by Luis Arce (MAS) repealed those decrees in 2021 for being against the constitution and the components of the rights of Mother Earth (Supreme Decree 4490). But again, in October 2022, he authorized the detailed evaluation and risk assessment of the suitability of the drought tolerant HB4 soybean.[154] These political episodes of how an interim government quickly introduced the laws and how they were repealed and again brought by the subsequent government show the influence and power the agro-industrial sector in Bolivia holds. Geddes assesses that, in many instances, economic and corporate demands have been prioritized in Bolivia, eroding the strength of this international counter-hegemony project.[155]

Along with the inclusion of GM soybean under the narrative of food sovereignty, the agro-industry presents the soybean sector as an 'inclusive' model benefitting the smallholder farmers.[156] Remarkably enough, some smallholder farmers groups of the eastern region align with the agro-industrial sector in support of GM crops seeking further approval of GM crops. Gustafson argues that the agro-industrial sector can mobilize the smallholder soybean producers to push for GM seeds because they remain trapped in debt relations and continually depend on seed and chemical inputs.[157] Thus, they act on the hope that the newer GM seeds would secure/increase the production, ultimately getting them out of debt. Furthermore, as discussed above in in Section 4.2, within the smallholder farmers there are categories of farmers who (i) stop producing soybean (and rent out their land to bigger producers) and those who (ii) continue producing soybean (and likely enter credit contract with companies). Within this second category of smallholders who continue to produce soybean, there is a sub-category comprising only around 10 percent of the smallholders, which Castañón Ballivián refers to as

[149] Castañón Ballivián (n 128).
[150] Dargent & Urteaga, (n 140), 554.
[151] J Cockburn, 'Bolivia's Food Sovereignty & Agrobiodiversity: Undermining the Local to Strengthen the State?' in *Food Sovereignty: A Critical Dialogue, International Conference, Yale University, Sept 14-15, 2013* (Conference paper 59, 2013), 15.
[152] B Gustafson, 'Continuity and Change in Bolivian Land Politics and Policy' in Soledad Valdivia Rivera (ed), *Bolivia at the Crossroads* (Routledge 2021), 90.
[153] Soliz Tito (n 145), 15–17.
[154] ANAPO (n 143), 31.
[155] Geddes (n 33).
[156] Castañón Ballivián (n 128), 83.
[157] Gustafson (n 152), 90.

'rich' smallholders.[158] This so-called rich smallholder group of farmers manages to insert itself into the soybean production model and appears in the statistics of the agro-industry under the label of 'small producers'.[159] While still smallholders under the law as they formally own an average land of 67 hectares, in practice, they control between 100 and 200 hectares by renting the land of other smallholders.[160] However, they are still subordinate to the big producers. While the number of these farmers accounts for only 10 percent of the smallholder's population, they have formed as a basis for a generalization to include the rest of the region's smallholders.[161] Høiby and Hopp refer to these influential smallholder farmers as a part of the 'emerging elite' in the soybean sector in Bolivia, who, along with the traditional elite, is influencing the government to take a pro-GMO position.[162] While politically these emerging elites have radically different political position than those of the traditional elite, the GM soybean is one of the sectors, where their interests align.[163]

While Bolivia has been struggling to balance its ideological orientation with the interests of economic elites, Ecuador, which has constitutionally embraced *vivir bien,* has successfully banned GM seeds. Connecting the critique of the commodification of plant life with the principles of *vivir bien* and rights of nature, the Ecuadorian court in 2019 ruled that GM soybean cultivation violated Ecuador's constitutional rights to a healthy environment, rights of nature, and the guarantee of being free from transgenic crops.[164] In 2022, the Ecuadorian Constitutional Court once again declared the attempted introduction of GM seeds unconstitutional, citing that the proper lawmaking procedures had not been followed.[165] Jefferson, however, observed that several factors including political pressures and international obligations constrain the Ecuadorian genuine desire for an eco-centric policy shift.[166]

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[158] Castañón Ballivián (n 128).

[159] ibid, 83.

[160] ibid, 80;An Independent Consultant (researcher) from Bolivia suggests that the farmers of Santa Cruz who are involved in GM soybean cultivation and demand more GM crops, although technically smallholders, are comparatively more well-off farmers (Interviewed on 06 September 2021 (Online).

[161] Castañón Ballivián (n 128), 83.

[162] Høiby & Hopp (n 137), 54–62.

[163] ibid, 54.

[164] The court ruled that treating plants and seeds as proprietary goods threatened farmers' food sovereignty and vivir bien rights. The court ordered the Ministry of Agriculture to carry out perennial inspections to prevent the cultivation of GM crops and to conduct training for farmers and concerned officials on the constitutional ban on GM seeds. See *Federation of Agricultural Centres and Campesino Organisations of the Coast vs Ministry of Agriculture* 2019, case nn.12283201802414 (Criminal Judicial Unit of Quevedo, Province of Los Ríos)*;* Also See the decision on the case by the Multi-competent Chamber of the Provincial Court of Justice of Los Rios, case oo: 12283201802414, Second Instance.

[165] In 2022, the constitutional court of Ecuador declared the article 56 of the Organic law on Agrobiodiversity, Seeds and Promotion of Agriculture which sought the entry of GM seeds for research as unconstitutional. The court examined whether the permission for the entry of transgenic crops and seeds, outlined in Article 56 of the Organic Law on Biodiversity, Seeds and Promotion of Sustainable Agriculture, adhered to the constitutional procedure and, as a result, is valid under the Constitution. The permission for the entry of transgenic seeds and crops "to be used for research purposes," as indicated in the text of the contested Article 56 of the law, was introduced by government.The court explained that although the Article 401 of the Ecuadorian Constitution provides an exception that allows entry of GMO when there is a "national interest," and is duly justified, the permission contained in Article 56 of the law is unconstitutional, as it did not follow the proper procedure that should have been observed in the process of law making See Sentencia No. 22-17-IN.

[166] DJ Jefferson, *Towards an Ecological Intellectual Property: Reconfiguring Relationships Between People and Plants in Ecuador* (1st edn, Routledge 2020), 187.

Nevertheless, the fact that GM seeds were not introduced earlier in Ecuador might have aided the country to ban them entirely. Notably, in Bolivia, the adoption of GM seeds has led to socioeconomic changes altering the agricultural landscape, making it difficult for leaders to reverse the permissive stance towards GM crops,[167] despite visible political willingness at least in the early days of adoption of the new constitution.[168] Rather, the agro-industrial agenda has been accommodated in the narrative of *vivir bien* and food sovereignty.

As the weeds are becoming resistant to the herbicide [169] the output is decreasing,[170] the soybean industry is pushing for new varieties of GM soybean as the solution. Moreover, while the law explicitly prohibits GMO in species that are centre of origin/ diversity in Bolivia, to make a case for the legalization of GM in corn, which is native to Bolivia, they absurdly argue that the eastern plains are not considered centers of origin or diversity for the crop, and therefore GM maize could be released in those areas.[171] Furthermore, as the maize pollen moves in substantial quantities over a range of more than four kilometers,[172] it will be difficult limit it to the cultivated fields.[173]

6. Conclusion:

While Bolivia has set a journey towards an alternative development based on *vivir bien*, and to a considerable extent influenced international law-making, domestically, it faces several challenges. Although the government initially attempted to reverse its permissive stance on GM soybean, later it found itself facilitating the expansion of GM soybean. The interests of agro-industrial sector are successfully inserted in the broader political ambition of food sovereignty and farmers' rights, which has diluted the meaning and strength of these concepts. From exercising rights to save seeds to the issue of the credit contract, debt and renting out their land as discussed above in section 4, soybean farming in Bolivia shows a wide range of complex matters tangled together that affects smallholder farmers. This article discussed these issues from the perspective of farmers' experience in dealing with the seeds of GM soybean and PVP law.

Despite the refutation of commodification and privatization of genetic resources in international forums, the Bolivian PVP law remains in force. The PVP law stemming from its obligations under UPOV and Andean Decision 345, explicitly restricts exchanging of seeds,

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[167] Dargent & Urteaga (n 150), 554.

[168] The concept of "lock-in" as the end state of a path-dependence could be an interesting analysis to pursue in relation to the situation in Bolivia, however, it is beoynd the scope of this paper. For the use of the concept in seed systems see C Hacquet, J Hermesse, and PM Stassart, 'The "lock-in" of the seed system and issues arising from its reappropriation' (2018) 202 *Études rurales,* 8.

[169] Environmental biotechnologist, IGEM Bolivia, interviewed on 25 June 2021 (Online); Gustafson (n 152), 87.

[170] Gonzalo Colque in Fundación Tierra, '¿Qué Hay Detrás de Los Transgénicos?: Tenencia de La Tierra, Agronegocio y Rendimientos Foro Virtual 04 de Junio de 2020' (2020), 24.

[171] ANAPO (n 143), 32.

[172] F Hofmann, M Otto, and W Wosniok, 'Maize Pollen Deposition in Relation to Distance from the Nearest Pollen Source under Common Cultivation - Results of 10 Years of Monitoring (2001 to 2010)' (2014) 26 *Environmental Sciences Europe* 24.

[173] 'Despite the fact that Bolivia is considered a centre of native maize, GM maize is already in our country. Although there is no legal authorisation, it has been cultivated in Bolivia since at least 2015. The seed comes from neighbouring countries, mainly Argentina. Now, pressure is growing for its legalisation.' Fundación Tierra (n 154), 24.

albeit allowing an exemption for smallholders to save seeds in their own farms. However, in practice, several factors make it practically difficult for smallholder farmers to save seeds; thus, most of them end up repeatedly buying seeds, rendering this exemption unused in case of soybean farming, and creating dependence on buying seeds, along with the required chemicals. The credit terms offered by seed companies further ensure the repeated purchase of seeds. The case of Bolivia shows that a mere exception to save seeds is not adequate to retain farmers' ownership over the seeds, particularly in industry-intensive farming. Therefore, the seed suppliers practically exercise more rights than granted by law, ultimately securing the repeated purchase of seeds even from the smallholders. For smallholders to benefit in the highly industrialized farming, support to exercise their legal rights like seed saving along with facilities like seed processing cooperatives and assisting their inclusion in the value chain is required. Otherwise, they might be pushed out of farming, as seen in Bolivia. This shows that farmers' relation to their land depends on their accessibility and control of primary inputs of agriculture, the seeds. Therefore, enabling these smallholders to exercise their legally recognized right to save and repeatedly use their own seeds could be one of the means to protect them from the agricultural exclusion currently happening in Bolivia.