Epistemic Marginality, Higher and Environmental Education in Colombia

Marginalización epistémica, educación superior y ambiental en Colombia

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ABSTRACT

Due to their ecological and cultural wealth and diversity many Latin American countries suffer from the exploitation of natural resources and environmental conflicts. These are furthered by many interconnected factors: divergent world views on land and territory and the competitive interests that stem from them (land and nature as livelihood with symbolic meaning *vs.* land and its resources as commodity), multiple legal systems (legal pluralism), different social relations and equally divergent strategies and technologies to transform nature. In Colombia among other countries, these factors are largely responsible for the emergence and intensification of the unsustainable resource use and the exploitation of natural resources, for example through an increase of extractive activities such as mining and agricultural practices in the style of the green revolution. Both are privileged in the current conventional and neoliberal model of development, with serious destructive consequences for the natural and cultural environment (symbolic, social, economic, political and technological). Strategies to solve the mentioned problems need a critical reflection on the epistemic foundations that represent diverse perspectives on ecology, development and the environment. We assume that higher and environmental education are important aspects, political agents and protagonists for the enforcement of ideologies and interests, and should therefore be diversified to increase political participation and decrease social inequalities.

RESUMEN

Como consecuencia de su riqueza y diversidad ecológica y cultural, muchos países Latinoamericanos sufren de la explotación de sus recursos naturales y de conflictos ambientales. Estos problemas son el resultado de muchos factores interconectados: cosmovisiones divergentes sobre la tierra y el territorio y los intereses competitivos derivados de ellas (la tierra y la naturaleza de la vida con un significado simbólico *versus* la tierra y sus recursos con un significado de mercancía), múltiples sistemas jurídicos (pluralismo jurídico), distintas relaciones sociales y estrategias y tecnologías divergentes para transformar la naturaleza. En Colombia, entre otros países, estos factores son en gran medida responsables de la emergencia e intensificación del uso insostenible de recursos naturales, por ejemplo, por el aumento de actividades extractivistas como la minería y las prácticas agrícolas al estilo de la revolución verde, ambas privilegiadas en el actual modelo convencional y neoliberal de desarrollo, con graves consecuencias sobre el del medio ambiente, tanto biofísico o natural como cultural (simbólico, social, económico, político y tecnológico). Las estrategias para resolver estos problemas requieren una reflexión crítica del papel de la educación superior y, en particular, de la educación ambiental, junto con sus fundamentos epistémicos que representan diversos planteamientos desde la ecología, el desarrollo y el medio ambiente. Asumimos que la educación superior y ambiental son aspectos claves, agentes políticos y protagonistas para el fortalecimiento de ideologías e intereses que tendrían que ser diversificados para aumentar la participación política y disminuir las desigualdades sociales.

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Introduction

Colombia is one case in point for a country in which social inequalities are deeply entrenched with certain development models, territorial rights, land use, land access, extraction of natural resources and related diverse forms of violence, thus reproducing structural inequalities and conflicts (Fajardo, 2014; Rodríguez and South, 2017). The long-lasting armed conflict between various Colombian governments which started in the mid-1960s and different guerrilla groups such as the FARC-EP (*Fuerzas Armadas Revolucionarias de Colombia – Ejército del Pueblo*, today *Fuerza Alternativa Revolucionaria del Común*) and ELN (*Ejército de Liberación Nacional*) among others, shows the linkages between the armed conflict and the historically derived inequalities of access to land and territorial distribution (Alvarado et al., 2016). In Colombia, this relation has led to the exploitation and destruction of the environment, the expropriation of land (land grabbing) and the ongoing displacement of the rural population[1]. Currently, Colombia faces a unique historical challenge with the 'post-conflict' (*posacuerdo*), because the peace agreement with the FARC seem to place an end to the armed conflict, at least concerning this armed group of the political insurgency (because there still exist other violent sectors which are tied to processes of illegal trafficking of narcotics and territorial dispute). In addition, questions of social equity and improved education seem to play a crucial and acknowledged role for a stable and peaceful cohabitation. Agroecological practices and ways of using and protecting the natural resources are subjects of environmental education (Johnson and Mappin, 2009), which increasingly matter for ensuring a sustainable peace in Colombia.

Andean countries with indigenous population are confronted with two lines of argument that stand in opposition to each other and take different shapes: on the one hand, the modern binary and Eurocentric thinking has fostered the capitalist and developmentalist notion of an ongoing and increasing potential for economic progress, very much coherent with a biblical notion of dominating the

earth and all living creatures therein (cf. Grosfoguel, 2000). On the other hand, there is the communitarian thought of living in harmony with nature, respecting the finiteness of the natural resources on earth and the need to protect ecosystems as a subject of legal constitutions (Acosta, 2013).

The domination of the former virtually materializes in an aggressive dynamic of international market forces characterized by unjust terms of trade that marginalize the countries of the Global South within the international markets. It further causes the increasing destruction of livelihoods and ecological systems, climate change, the decrease of biodiversity, among other disastrous impacts. On the other hand, the mentioned communitarian thought has been debated critically and at international level, for example, at the annual World Social Forum where civil society organizations come together to discuss alternative modes of living. It was also applied in critical theory and post-colonial thinking to de-colonize science and higher education and give justice to non-Western epistemes and educational approaches (Escobar, 2000; Grosfoguel, 2013).

The discourse around the "*Buen Vivir*" or "Good Living" (Sumak Kawsay in Quechua), a concept that arose among the indigenous population of Latin America in early colonial times (Quijano, 2012) as a form of social living beyond colonial structures of power, was recently revitalized. These opposite positions of development and well-being influence the purpose of education and environmental education, which often serve in the function of advocacy for respective socio-cultural, economic and political systems. Even though the concept of "*Buen Vivir*" has been made a subject of the constitutions of Ecuador and Bolivia (Gudynas and Acosta, 2011) and forms the center stage of critical debates about development, it is still a marginalized and utopian vision of social life.

Within the educational variety, higher education reveals itself as a political agent and protagonist for the enforcement of ideologies and interests. These interests stem from a larger socio-economic and political context and its impact on the environment. To address environmental issues, changes and conflicts in a post-colonial setting such as Latin America and Colombia, a research desideratum arises from the

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1 Currently there are up to 7 Mio internally displaced people in Colombia.

question on how global educational spaces still reflect structural conditions and practices of exclusion from the 16th century onwards. Since then and for centuries, 'other' systems of knowledge production within the colonialized countries were marginalized and provincialized systematically (Grosfoguel, 2013). Point of departure for this argument is the assumption that eurocentrism and a western philosophy were brought forward to dominate the structure of knowledge production at global level, while claiming a universal value which is leading to an epistemological dualism, dividing knowledge and respective environmental practices into 'superior' and 'inferior'.

The present article results from an ample discussion among partners within the German Academic Exchange Service (DAAD, by its acronym in German) funding line "Bilateral graduate program" between the Center for Development Research (ZEF, by its acronym in German) at the University of Bonn and the Institute for Environmental Studies (IDEA, by its acronym in Spanish) at the National University of Colombia (UNAL, by its acronym in Spanish). Within this framework an interdisciplinary doctoral studies support program (DSSP) is established which is financed by DAAD and the German Ministry for Economic Development and Cooperation (BMZ, by its acronym in German). Further objectives of the project are to jointly develop a research program addressing the Sustainable Development Goals (SDGs) and to critically reflect on the role that universities and higher education play for reaching the SDGs, taking into consideration an internationalized educational system that commercializes and synchronizes the worldwide existing and diverse educational structures, contexts and contents.

Therefore, the objectives of this paper are:

1. Identifying the epistemological asymmetries within higher education landscapes (geopolitics of knowledge) of today and link these differences to historical trajectories of colonialism, eurocentrism and the coloniality of power which influence environmental thinking and acting. It is assumed that the geopolitics of knowledge affect both educational inequalities and the

structural vulnerability of the so-called developing countries.

2. Describing and contextualizing (embeddedness of knowledge production) the multiple inequalities in Colombia and their impact on the environment, on environmental thinking and on environmental conflicts, including a discussion on different development models (developmentalism) and extractive activities, while looking at alternatives beyond a utilitarian understanding of education for sustainable development.

After this introduction, the second section analyses the geopolitics of environmental knowledge production embedded in higher education policy guidelines within the Agenda 2030 and the SDGs. The third section presents the challenges of higher education in Colombia and argues that the educational system is increasingly commercialized and privatized on the expense of a sustainable agriculture and agroecological practices. In the fourth section environmental education in Colombia is looked at in particular as an alternative educational model also implemented in the Colombian legal system. The fifth section presents environmental education for alternative and more embedded agricultural practices against the promotion of monocultures, the use of heavy agricultural machinery and the massive application of pesticides. The sixth section showcases how knowledge production is embedded in a "colonial matrix of power" (Quijano, 2007) being contested by indigenous councils and organizations involved in (higher) education. The last section concludes with a vote for new approaches and decolonialized methods for the study of complex and interrelated social and environmental problems that can only be successful by recognizing different ways of thinking and living human-nature relationships.

Geopolitics of Knowledge and Globalization of Higher Education or why the Sustainable Development Goal 4 and consequently the Agenda 2030 could fail

The SDG 4, "Ensure inclusive and equitable quality education and promote lifelong learning

opportunities for all", is one out of 17 goals within the UNESCO (United Nations Educational, Scientific and Cultural Organization) resolution for sustainable development that was agreed upon by the international donor community and declared in September 2015 in South Korea. Within the Agenda 2030 a new alliance for more equity and inclusion in education is envisioned for vulnerable parts of the population, including disabled persons, indigenous people, refugee children and poor children in rural areas (UNESCO, 2015). The vision is about transforming lives by means of education, and recognizing the important role of education for development and for accomplishing other SDGs.

Point of departure of the Agenda are the five P's, namely: people, planet, peace, partnership and prosperity, which are meant to represent a holistic perspective. The objectives are driven by shared values and principles such as eradicating poverty, ensuring human rights and dignity, creating gender equality, empowering women and children, realizing inclusive societies, protecting common goods and natural resources, and ensuring good governance. In order to reach the SDGs, trade-offs need to be addressed by scientific and contextualized analysis in order to better understand related problems and processes to solve them.

The international institutions and organizations working on the realization of the SDGs agree upon the necessity for the implementation of knowledge-based strategies to be able to reach the Agenda 2030. At an international conference organized by German institutions of development research and aid in Berlin in March 2017 on "The role of higher education, science and new alliances", the international community for sustainable development discussed the role of universities and research institutions to foster and intensify international networks and alliances across the globe, North-South and South-South partnerships across territorial, socio-economic, political, cultural and symbolic boundaries, to implement and enforce strategies for joint knowledge production.

It was understood that knowledge production is one-dimensional and Eurocentric, still dominated by the western episteme and transferred from the Global North to the Global South. This hegemony of western educational systems discriminates other educational approaches and impedes educational diversity. What characterizes the international relations in higher education needs to be replaced by joint knowledge production and practice-based capacity building (BMZ, 2017). There is a need to integrate scientists, decision makers and actors from civil society at an early stage in the Global South to identify jointly sustainable development related problems and research for solutions.

Even though the protagonists of the SDGs and respective targets aim at looking beyond a utilitarian approach towards sustainability education, the practice of many international projects and collaborative efforts to improve education worldwide still comes along with a predominantly economic thought. The evaluation and differentiation of universities by standardized assessments with global classifications of educational indicators at international level (such as PISA, AHELO[2]) work into this direction by creating "spaces of equivalence" (Morgan and Shajaran, 2014, p. 6) that are linked with both colonial based geopolitics of knowledge and competition for global positioning and enterprising purposes.

In this utilitarian approach to education, higher education should serve the demands of the market and integrate knowledge carriers, academics and scientists into a rewards-oriented competitive profession (Morgan and Shajaran, 2014). The graduates are going to be prepared and their social capital is made available for an increasing interaction with international companies in order to serve a professional culture of audit and accounting. Educational practice should therefore be adapted to the measuring performance of scholars in higher education as stated by the authors to produce labor for the demand of technological and economic development goals. Those countries who cannot compete, (mainly from the Global South as shown in PISA and AHELO outcomes) stay behind expectations and are being stigmatized of having bad educational systems. In practice, these measures manifest and materialize the production of privileged and

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2 AHELO (International Assessment of Higher Education Learning Outcomes) is one instrument that exemplifies the diffusion and internationalization of competitiveness and monetization of higher education outcomes.

non-privileged regions for the exploitation of human force in the global labor market. In addition to the consequences for global trade and services, the epistemic marginalization of other educational systems internally reproduces injustice and multiple inequalities that need to be investigated and analyzed in its manifold and contextualized effects.

Looking at international and national strategy papers also reveals higher education as an instrument for economic growth and increasing productivity. Higher education plays a key role in qualifying for the demand for skilled work labor for the international market and thus is subject to a commercialization for market requirements. This process can easily be retraced by the different strategy papers applied to higher education at national and international level. In the World Banks' evaluation report on 'Higher education for development', for example, the authors mention three main missions of higher education, and state regarding the first mission 'teaching and learning': "As economies move up the value chain, they require a more educated and productive workforce. This requires improved management and specialized skills such as those in physical and social sciences, engineering, and business management" (World Bank, 2017, p. 3). Competitiveness of national economies, their efficiency and innovativeness is considered besides research (second mission) and community engagement (third mission) as the most important contribution of higher education institutions to development. And the enrollment of the private sector as provider of higher education institutions further influences the educational landscape, making higher education more costly and inaccessible for the less endowed (World Bank, 2017, p. 15). In addition, the increasingly deployed evaluation instruments in higher education such as AHELO stress the strategy towards efficiency and technical innovation. AHELO, an instrument effected by the Organization for Economic Cooperation and Development (OECD) countries to compare higher education outcomes worldwide, was carried out between the years 2010-2013.

The effectiveness study had the objective to immediately evaluate the performance of students at global level and to be valid across different cultural backgrounds, languages and institutions (OECD, 2018). Apart from general aptitudes, the study puts emphasis on the thematic areas economy and engineering, and related capacities needed for entrepreneurial careers (OECD, 2012). Programs such as the PISA "Programme for International Student Assessment" by the OECD advance into the same direction. PISA assesses students at the age of 15 in a triennial analysis with the aim to evaluate educational systems in science, mathematics, capacity to read and solve collaborative and financial problems.

The introduction of PISA as a global evaluation tool was critically discussed due to different problems related to its universal claim of comparability and accessibility of diverse educational systems worldwide. A group of academics from all over the world expressed their concerns about the usefulness of PISA in an open letter to the director of OECD's Programme for International Student Assessment, Andreas Schleicher. The open letter was published in The Guardian on May 6, 2014, underlining that "OECD and PISA are damaging education worldwide - academics" (title of the Guardian article) (The Guardian, 2014). In the open letter the escalation of standardized rankings in education and the "increased reliance on quantitative measures" are underlined. In contrary, less measurable skills "like physical, moral, civic and artistic development" are paid less attention. Countries would have to take short-term actions to climb up the rankings rather than enduring changes that might only take effect after decades. Notwithstanding, educational programs need to be implemented on the long run and cannot expect short term results. The senders of the letter also remarked on the role of the OECD. As an organization for economic development, OECD is "naturally biased in favor of the economic role of public [state] schools". Education should promote political participation, "moral action and a life of personal development, growth and well-being" rather than preparing young people for productive employment. They conclude by emphasizing that: "No reform of any consequence should be based on a single narrow measure of quality" (The Guardian, 2014).

The German Ministry for Economic Cooperation and Development (BMZ, 2015) published a

strategic paper on education for bilateral and collaborative projects on "Creating equitable opportunities for quality education". Therein, more integration of higher education with other educational systems at secondary and primary level is stressed as much as the increasing application of Information and Communication Technologies (ICTs) for the extension of educational measures to centers that should be more effective in innovation and communication. While the strategy paper proposes more equity in the access to education and more quality education at different levels, the practice collides with the ambitious objectives. It is undeniably important to adjust higher and professional education with basic education as it is necessary to create inclusive education in order to avoid leaving someone outside the system. And it is important to improve education in international cooperation by means of curricula development, the equipment of teaching halls and the creation of centers for the training of professionals (BMZ, 2015, p. 3).

The challenge hides behind the claim that education should serve the increasing demand for labor in the informal economy being driven by international companies that act according to the regulations of the World Trade Organization (WTO) and the General Agreement on Trade in Services (GATT). Since its ratification by the Western world in 1948 (compare the charter of La Habana from 1947) and its transformation to WTO in 1995, the GATT regulated diverse aspects of globalization. By means of numerous free trade agreements, the protection of markets and the bargaining power of industrialized nations, the countries of the Global South suffer systematic disadvantages including excessive resource exploitation in developing countries and the homogenization of cultural particularities, with disastrous effects on the environment and local communities (Stiglitz, 2002).

Regarding such globalization forces including the sustainable development paradigm that tries to balance ecological, social and economic dynamics in its conceptualization, Jickling and Wals (2008) state that the nature and purpose of education change because of the restricted freedom of thought and action in environmental and social education. The demand for solutions within diverse educational systems is deprived by the economy and the private sector, which in turn destroys the opportunity for contextualized solutions. It also impedes, as argued by the authors, participatory and transformative action (Jickling and Wals, 2008, p. 9) on the long run.

Having said that, we would venture to point out that the solutions for development presented by the international community to increase the enrollment rate in higher education in African, Latin American, and Asian countries[3] are insufficient to create more equity. We are facing entangled problems related to structural inequalities, power relations and the respective hierarchization of regions, countries, and humans that need further contextualized exploration. It is all the more important to study the interrelationship between the epistemic marginality and education in a contextualized scientific analysis.

Higher Education in the Colombian Context

Colombia does not escape from this global trend. Although we cannot generalize the orientation of the entire higher education system, it is possible to find strong tendencies that reveal the affinity with the market, the competitiveness and the efficiency of many public and private policies on higher education.

Today, higher education in Colombia is based on the mandates established in the Political Constitution of 1991, which, as a social State of law, understands education as a right of the people and a public service with a social function. However, the processes of economic liberalization that took place in the nineties permeated Law 30 of 1992, a public policy that governs higher education in Colombia. These processes guided the policy in order to respond to the demands of the scientific-technological development and the professional market (Soto, 2005), as well as to address the new economic model (which imposed the reduction of the State, macroeconomic stability, enhancement of market forces and economic growth) (Dimaté, 2009). In this way, Colombian

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3   In the African case, the enrollment rate in higher education is with 4-8% still quite low in comparison with Europe or North America, with 75% (UNESCO, 2016).

education has gradually lost its character as a right to be introduced in a logic that reduces it to the level of a service (García, 2018), where programs that support the needs of the market are privileged, ignoring other ways of knowing and living.

Between 1994 and 1998, quality standards in education were introduced in Colombia, including the effectiveness of finding financial resources from universities, dissociating the State from this responsibility and subjecting educational institutions to the search for financial resources (García, 2018), which can transgress the autonomy of educational institutions. On the other hand, educational quality is understood as a strategy to compete (Giraldo et al., 2007) and not as a path for human development.

The introduction of free trade agreements in Colombia since 2000 has also influenced changes in higher education by forcing it to enter into global market dynamics. Therefore, education is understood as a tradable service that can be measured with criteria of maximum utility and minimum costs. Hence, it drastically restricts the freedom of action of educational institutions to these requirements (García, 2018).

The global demands even have had an impact on the conception of the curricular construction, since it is expected that students can demonstrate certain competences to fulfill the tasks demanded by globalization at the end of their training. The modernization of production processes, technological advances, changes in the structure of employment, the emergence of uncertain work environments, new demands for job performance, the use of information technologies, among others (Escorcia et al., 2007) are some of the factors that mobilize the configuration of the curricula. While they can respond to the advance of science and technology, they are limited in terms of the breadth of knowledge and restricted by the framework of the scientific method as a way to achieve it. Under these precepts, the academy becomes another element in the productivist machine, without space for reflection or critical thinking against the prevailing model. Likewise, adjusting to international trends appears as an imperative, blurring the importance of the territory and the particular characteristics of the place (Escobar, 2000).

This is how Colombian institutions have tried to transform the role of the university towards a business logic that responds to precepts of competition and the search for efficiency (in which financial interests prevail). In this rationality it is understood that the educational institution must be seen as a knowledge enterprise, where services and goods are produced, such as education, science, technology and culture, to achieve true sustainable and sustainable human development (García, 2018).

A particular example of the productivist trend of education in Colombia is the general objective of the Colombian policy concerning the Human Capital Formation System (SFCH, by its acronym in Spanish) contained in the document of the National Council of Economic and Social Policy (CONPES, by its acronym in Spanish) of 2010. This document literally states that this policy:

"[…] seeks to establish the necessary guidelines to strengthen the SFCH in order to enhance its effects on the growth of the economy, increasing productivity, the ability to innovate and competitiveness, as well as social mobility, from the development and implementation of strategies that allow the Colombian State to build a human resource management scheme for the country. Such a scheme will allow to guide and define in the short, medium and long term the policies of human capital formation, under the principles of relevance, continuous accumulation of knowledge and skills, and assurance of the quality of the training offer, following an approach of labor competences" (DNP, 2010, p. 50).

The mere fact of considering the users of education as "human capital" reveals the strong productivist bias that characterizes the national educational policy of the country. This ideological and conceptual bias has been evidenced by several researchers, who indicate that such educational system operates in terms of production, capital, profitability and economic growth, dividing the world in the way of entrepreneurs, employees and consumers (Martínez, 2017). In this context, "[…] educational institutions, rather than centers of thought, are seen as companies that guarantee economic gains for a few (...) it is an education that is only accessed by 'clients' who can pay for the service" (Martínez, 2017, p. 4).

According to the National-Ten-Year Education Plan 2016-2026 provided by the Colombian Ministry of Education, education is indeed perceived as a driver for economic development (Mineducación, 2017). This trend can also be illustrated by the following example: in 2004, the Ministry of Education designed The National Bilingual Program because "English is seen mainly as a means of increased competitiveness and internationalization in Colombia" (De Mejía, 2011, p. 12). The aim of this program was that by 2019, all university and school graduates should attain a B1 or B2 level in English when finishing their studies. This program is "part of a vision of increased productivity in a globalized world" (De Mejía, 2011, p. 7), but there can be no doubt that it also has its downsides: although the program promotes bilingualism, its main focus is an improved proficiency in the English language. In order to achieve this proficiency, the Ministry of Education published in 2006 a document called "The Basic Standards of Competence in Foreign Languages: English based on the Common European Framework of Reference for Languages (CEFR)" (De Mejía, 2011, p. 8). Hence, the adoption of this framework was at the expense of other forms of bilingualism. Therefore, a number of Colombian scholars have criticized the bilingual policies implemented by the Ministry of Education for not taking local knowledges and perspectives into account. In fact, apart from criticizing the exclusion of indigenous and creole languages, these scholars have also highlighted the exclusion of foreign languages.

In sum, Colombian scholars perceived the adoption of the CEFR framework as an imposition by the British Council (which was responsible for the coordination of processes) and the Ministry of Education (De Mejía, 2011). Although indigenous languages were officially acknowledged by the Political Constitution of 1991 and although the design of curricula which consider indigenous languages was officially acknowledged in 1994, "there remains a notable absence of a coherent national policy involving all languages in play" (De Mejía, 2011, p. 14). Consequently, this example indeed illustrates that the Colombian government is aiming for an increased competitiveness of the country at the expense of local forms of knowledge production.

Environmental Education in Colombia

In contrast to the situation of higher education, there is environmental education, understood as a possible alternative in which a more embedded and integrative vision of education builds the framework for contextualized knowledge production.

In the Colombian case, the first normative elements of environmental education were presented in 1974 in the National Code of Natural Resources (*Código Nacional de los Recursos Naturales*), a document that introduced some specifications in the formal sector of education from a conservationist perspective. Although this Code in the end did not cause relevant changes in this matter, it succeeded at putting ecological education and preservation in the education agenda (Ministerio de Educación Nacional and Ministerio de Ambiente Vivienda y Desarrollo Territorial, 2012).

Later, the context of the National Constitution of 1991 and the creation of the Law 99 of 1993, determined the legal parameters in which environmental education could play an important role and allowed the synchronization between the Ministry of Environment and the Ministry of Education, so they could articulate programs, plans and curricular proposals to strengthen The National Environmental System (SINA, by its acronym in Spanish) (ibíd.).

In 1992, the Ministry of Environment signed an agreement with the IDEA, in which emerged the necessity of inclusion of an "environmental dimension" in education. There were three work phases: (1) an exploration phase, that resulted in projects, proposals and activities; (2) a theoretical reflection about education and environment (that later allowed the formulation of the General Law of Education); and (3) the projection of a National Environmental Education Policy (ibíd).

Regarding this work and the National Constitution of 1991, the Law 115 of 1994 (General Law of Education) established the education about environmental protection, ecology and natural resources preservation as mandatory in formal schools (Paz et al., 2014). Nonetheless, this law is not generalized for every education sector, so it does not include higher education, leaving this work at their will and interpretation (Berdugo and Montaño, 2017).

The National Program of Environmental Education was established from these and later normative dispositions, and it has allowed the coordination of the educational system with the SINA and other research institutions. The proposed actions aimed at introducing the environmental dimension as an integral part of formation, understanding it as a complex and systemic subject whose approach cannot be limited to isolated actions, but rather targeting a complete transformation of education (Ministerio de Educación Nacional and Ministerio de Ambiente Vivienda y Desarrollo Territorial, 2012). In the National Environmental Education Policy (2002) there is the intention of improving the system, so every scenery and level of education could be included, and the approach could be as holistic as needed for achieving sustainability.

Education and agriculture

Education understood as an instrument to increase efficiency and competitiveness is applied in most of the agricultural schools, where the lessons about technologies, systems and procedures linked to the Green Revolution (GR) predominate until today. This GR paradigm overlooks the substantial differences between tropical and temperate countries, not only in biophysical (soils, climates, reliefs, biodiversity, water regimes) but also in cultural terms (history of occupation of territories, land ownership, social relationships, economic dependencies, and political orientations). The philosophy of GR is based on the following three general features, among others (León-Sicard, 2007):

1. Promotion of monocultures (contrary to the trends of greater biodiversity in the tropics), generally with seeds certified by multinationals, denying access to farmers.

2. The use of heavy agricultural machinery (insufficiently adapted to the geographical conditions of high mountains, which are characteristic for the main areas of food production in the case of Colombia) unsuitable for the structures of the tropical soil. This generates problems of compaction, loss of organic matter, edaphic water imbalances or displacement of microbial populations.

3. The massive application of pesticides (which eliminates the possibilities of agricultural management via the diversity of interactions between different organisms of different trophic links) that generates indebtedness of the peasants, problems of human intoxication and pollution of soil and water, as well as biodiversity loss.

The GR model, based only on the results of positivist science, also ignored the contributions of millions of peasants, indigenous people, afro-Colombians and local inhabitants regarding the knowledge and management of national agrobiodiversity. Some efforts to counteract this model of agricultural education have been taking place from the point of view of agroecology, one of the paradigms of alternative agriculture. From this perspective, the vertical relationships between the trainer or teacher and the student are questioned and different ways of knowing through sharing are privileged. The dialogue of knowledge, field schools, *campesino a campesino* (peasant to peasant) strategies, networks of seed custodians and peasant fairs are, among others, some of the strategies that are privileged in the Colombian countryside, to break with the vertical dependencies of a teaching entrenched in time and in other realities.

Beyond the symbolic representations and their expressions of value, the ecological agroecosystems have power in themselves and strength in the educational processes of conservation of resources, in the production of healthy food, in the correction of climatic imbalances and in the preservation of life. The agroecosystem is useful as a theoretical reference and as an educational instrument for change, both for children and young people, as well as for older adults (Sarandón, 2002; 2009).

In this sense, the daily actions of organic farmers have been examined to find out how they have constituted true cultures, or what Vandana Shiva (1993, cited by Rojas, 2010) has called *policultures of the mind* that represent a whole vision of the world based on the amplitude of knowledge, which is ecological and cultural at the same time. From this vision, the idea of the relationship between complex thinking and the sustainable management of agroecosystems is developed, and new ways of educational processes are proposed to bring the city students closer to

what is called "the great audience" of the nature in terms of "learning with life", that is, of students' approaches to peasant life, through the collective production and transformation of food (Rojas, 2010).

Of course, in order to achieve the above purposes, at least in higher education institutions in Latin America, some researchers propose a true cultural revolution, meaning that it is necessary to rethink the educational processes and to change the dominant agricultural paradigm (Sarandón, 2002). Such authors have been insisting at least in the last two decades that the change must occur in the entire educational institution, not only in the curricula, but also in the dominant paradigms of agriculture. This means that changes must also take place in the figure of the teacher-instructor, the student and the pedagogical and didactic techniques that persist and currently dominate the generation and transmission of agrarian knowledge, while not forgetting that this also obeys to the general synchronization of society with that dominant model (Sarandón et al., 2001).

The Embeddedness of Knowledge Production: Challenges for Environmental and Higher Education in Colombia

Within the context of higher education in Colombia, Cáisamo and García (2008) also note that knowledge production is linked to an economy, which merely requires professionals who work in a neoliberal system. Furthermore, they argue that the diversity of thoughts is still in continuous conflict with colonial discourses and a coloniality of knowledge that are reproduced by institutions of higher education. In other words, practices of domination and the hegemony of Eurocentric systems of knowledge remain in place (Fröhlich et al., 2017). Since the "European paradigm of rational knowledge" (Quijano, 2007, p. 174) is present until today, non-European cultures and ways of knowledge production are subordinate to the former (Quijano, 2007). This means that the rhetoric of coloniality of knowledge is still ongoing (Mignolo and Tlostanova, 2006; Mignolo, 2007).

In the light of this discussion, it becomes evident that "Scientific knowledge (…) is not a transcendent mirror of reality. It both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions" (Jasanoff, 2006, p. 3). In fact, the discussion above reveals that scientific knowledge is indeed influenced by the reproduction of discourses, whereby the discourses themselves are reproduced by institutions such as universities. Against this background, "[t]he action of indigenous organizations and peoples in the construction of a new form of education is evidenced in the role played by the CRIC and the OIA (…) Indigenous peoples and their organizations have developed a resistance movement against the oppression of the State and dominant sectors" (Nemogá-Soto, 2018, p. 15).

Thus, when members of the Regional Indigenous Council of Cauca (CRIC, by its acronym in Spanish) got aware of the exclusionary force of education provided by the government or the church, they started to establish schools that accounted for the needs of indigenous groups. Moreover, they started to provide trainings in order to professionalize bilingual teachers. Since the dominant hegemonic form of education did not acknowledge the needs of indigenous groups, the CRIC also played an important role for the creation of the Intercultural Autonomous Indigenous University. As a result, this university "links education scenarios to the political, social economic and cultural problems associated with the recovery and defense of territory" (Nemogá-Soto, 2018, p. 11). This linkage is reflected in the guiding principles of this university, which address the autonomy, understood as the people's right to develop their own space of cultural, administrative and academic organization (Bolaños et al., 2008).

The second organization mentioned above, namely the Indigenous Organization of Antioquia (OIA, by its acronym in Spanish), "created the Institute of Indigenous Education of Antioquia (INDEI) to orient preschool, school and high school curriculum, and to professionally train teachers" (Nemogá-Soto, 2018, p. 6). The organization did so in 1999 in order to address the shortcomings of conventional education. In 2007, the OIA started to cooperate with the University of Antioquia, whereby it significantly "influenced the curricular and pedagogical design" (Nemogá-Soto, 2018, p.

7) of the Bachelor in Education of Mother Earth (Stocel et al., 2013). According to Fröhlich et al. (2017), this Bachelor seeks to overcome the idea that indigenous actors are scientifically and socially backward. Additionally, the authors highlight that this Bachelor might even have the potential to change Colombia's political and educational system. The Bachelor in Education of Mother Earth uses an approach characterized by a combination of creative, critical, gender and decolonial perspectives. This also means that knowledge is produced collectively, which implies that the Bachelor makes use of intercultural methodologies that take the significant role of the earth as source of knowledge into account (Stocel et al., 2013). Hence, Abadio Green Stocel, president of the Indigenous Organization of Antioquia (Fröhlich et al., 2017) and his colleagues state that "The Bachelor in Education of Mother Earth is a proposal with a political, cultural and academic claim of the indigenous peoples who have always believed that the earth is our mother and teacher" (Stocel et al., 2013, p. 85). Consequently, since the earth is seen as a mother, it is the cultural, political and epistemic basis for everything (Fröhlich et al., 2017).

As can be concluded from the discussion above, the Bachelor in Education of Mother Earth embraces an approach which differs significantly from the predominant approaches taught at universities, since they mostly perceive the earth as a "simple resource" (Stocel et al., 2013, p. 85). Mato (2016) confirms that education programs and universities that adopt the worldviews of indigenous people, consequently promote non-hegemonic worldviews by "thinking about the future of our societies not in terms of 'development' –which continues to be understood as a concept closely tied to notions of 'progress' and 'economic growth', regardless of however much it may have been stylized as 'sustainable' –, but instead in terms of 'Living Well'" (pp. 228-29). This means living in a harmonious relationship with the earth without perceiving humans as superior to other beings and without perceiving humans merely as managers and users of natural resources (Mato, 2016).

Another initiative in the Colombian landscape of higher education, which is committed to the sustainable use and management of natural resources in order to protect them, is the Institute of Education and Research Manuel Zapata Olivella. This community-based institute is supporting afro-descendent groups by providing technical and higher education in accordance with their worldview. The institute is taking the plurality of knowledge and knowledge production into account and it emphasizes the dialogue between different forms of knowledge. Hence, the Institute of Education and Research Manuel Zapata Olivella is significantly contributing to the diversification of knowledge production by focusing on interculturality (Hernández, 2008).

Two further institutions, which also focus on non-hegemonic knowledge production, are the Cauca University (Rojas, 2008) and the Pacific University (Suárez and Lozano, 2008). The first one offers a training program for teachers who work with indigenous and afro-descendent groups. This program, called Ethnoeducation, is also committed to the development of alternative and intercultural ways of knowledge production. Therefore, it focuses on constant exchange and cooperative work with local groups, as well as with local organizations. Those activities are considered essential for a continuous and reciprocal dialogue of knowledges. This dialogue facilitates that local knowledges, for example about the environment, become part of the curriculum (Rojas, 2008). The second university, namely the Pacific University, goes even one step further in its attempt to combine different forms of knowledge: apart from concentrating on the dialogue and exchange of knowledges with local groups, this university is also seeking to establish and strengthen relationships with universities from abroad (Suárez and Lozano, 2008).

As mentioned above, various Colombian institutions and organizations are dedicated to non-hegemonic and alternative ways of knowledge production. Thereby, they are diversifying the country's educational system. Furthermore, the examples reveal that the role of the environment as well as its protection are central for alternative knowledge production. Apart from this, they show

that the inclusion of different forms of knowledge is also central in order to make education less dependent on Eurocentric discourses.

Having said this, it is necessary to consider that the Colombian government is also involved in a process of making education more inclusive and fairer. Accordingly, the Ministry of Education developed *Guidelines for Inclusive Education*. These guidelines were established in 2014 and according to the Ministry, they are essential for a society that seeks peace through reconciliation and reparation. Moreover, the Ministry has developed an index that enables institutions of higher education to evaluate how inclusive they really are, for example how they respond to a diverse student body (Mineducación, 2014). Additionally, the National-Ten-Year Education Plan 2016-2026 mentioned above also reveals that quality education is not only about being competitive but also about providing an educational system that is continuously improving and contributing to equity. The educational system has to compensate for socioeconomic disadvantages in order to develop equal opportunities and to attain socially desirable results for everyone (Mineducación, 2017). Hence, one of the challenges mentioned in the Educational Plan refers to the construction of a peaceful society on the basis of equity and inclusion with respect for ethics and gender equality. Therefore, one of the strategic guidelines concerns the avoidance of any kind of exclusion and marginalization. Thereby, it addresses for example the inclusion of people with disabilities, the development of relevant and own approaches for social groups and thus the associated recognition of diversity.

A further challenge mentioned in the Educational Plan addresses the promotion of a form of education that transforms the dominant paradigm in education. The strategic guidelines state, for example, that tendencies of homogenization have to be overcome in order to account for the heterogeneity of the country. Furthermore, they notice that educational institutions need to embrace an inclusive and participatory paradigm that is in line with the contexts, as well as with the social and cultural diversity of the country (Mineducación, 2017).

As clarified by the discussion above, education in Colombia is embedded in a frame of global competition and economic transformation (De Mejía, 2011; Mineducación, 2017). This frame has exclusionary consequences and reproduces discourses of domination (Fröhlich et al., 2017). However, various organizations and institutions of higher education are approaching knowledge production and education in a non-Eurocentric, inclusive, intercultural and decolonial way (Bolaños et al., 2008; Cáisamo and García, 2008; Fröhlich et al., 2017; Stocel et al., 2013; Hernández, 2008; Nemogá-Soto, 2018; Rojas, 2008; Suárez and Lozano, 2008). Moreover, the Colombian government is also engaged in a transformative process concerning the educational system in order to make it more just and equal (Mineducación, 2014, 2017).

Conclusion

This paper aimed at showing the potentialities and challenges for the achievement of SDGs in the Colombian context under conditions of the neoliberal model of development and education. It was argued that in Latin America in general and in Colombia in particular, knowledge and different forms of knowledge production are embedded in a coloniality of power relation in a post-colonial setting that still creates multiple forms of inequality, materialized in environmental educational systems and ways of agricultural production.

Although the paper has shown that Colombian higher education indeed focuses on competitiveness and productivity (De Mejía, 2011) by perceiving education and knowledge production as tools for economic development (Mineducación, 2017), and although the paper has argued that this leads to forms of exclusion (Fröhlich et al., 2017), alternative ways of knowledge production within Colombian higher and environmental education have also been presented. The paper highlights various initiatives such as the "Bachelor in Education of Mother Earth" (Stocel et al., 2013, p. 85) and agroecological practices focused on non-hegemonic and inclusive forms of knowledge production that take local contexts and environments (Rojas, 2008) into account.

This pluriversality (Mignolo, 2007) of knowledge production and environmental thinking is related to the ethnic and cultural diversity, different

languages, values, normative practices and community trajectories within this colonial matrix of power (Mignolo, 2007). Following this line of argument to discuss the role that (higher) education could play for reaching the SDGs, the purpose of this paper was to critically reflect and initiate a debate on the concepts and methods in international development and educational standards. Rather than imposing the Eurocentric development model that reproduces structures and relations of power and inequality by abusing the educational system to serve the interests of the market while destroying educational diversity and environmental education in Latin America, it is important to jointly discuss and conceive alternative development concepts based on decolonial methods and situated knowledge production.

Hence, engaging in the study of epistemic foundations, related practices and politics, means to look into the embeddedness of knowledge production in social identities, institutions, representations and discourses in order to state their role in the constitution of social order and power relations (cf. Jasanoff, 2006). It is important to find new approaches and methodologies in studying complex and interrelated environmental problems by addressing both social practices and material realities in an integrated way. The investment in jointly drafted projects, integrating scientific and non-scientific institutions, knowledges and practices outside the educational guidelines of the OECD countries is needed to engage in transformative action for more sustainability.

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