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RESEARCH ARTICLE

Qualitative and quantitative analysis of scientific contributions in agribusiness

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Abstract

The agribusiness is a major generator of employment and income worldwide and contributes to food security and nutrition. Therefore, the objective was to perform a qualitative and quantitative analysis of the scientific contributions in agribusiness. A bibliographic consultation was made in Scopus and "Agribusiness" was used as keyword. A textual analysis was performed on 407 scientific papers from 2020, through Nvivo 12 software using the following analysis codes: Mega trade agreements and institutional harmonization, farm-level technology pricing and contracts, market power related to the mega consolidation of companies, new agricultural technologies, emergence of agrocorporations, institutional land access rules, property rights regimes and their consequences, private enforcement of property rights, farmer class action studies and territorial reconversion. Two more codes emerged in the analysis process: Environmental impact and human health impact. Current scientific contributions in agribusiness are focused on new agricultural technologies (24%), environmental impact (17%) and local actions of farmers (14%). A qualitative improvement of the contributions is observed as more elements that support the complex processes agribusiness generates are increasingly incorporated. From focusing on economic and financial aspects, sustainability-oriented and social commitment domains are now considered. A modern and innovative concept defines agribusiness as economic activities with different forms or models of production, derived from or linked to agricultural products. It considers production-consumption processes and farmers are inserted in a differentiated way according to their economic rationality. These activities are not only focused on the generation of monetary value, but also on the social processes it produces, where multiple actors are involved.

Keywords: agribusiness; agroecology; conventional agriculture; sustainable development.

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1. Introduction

With the increasing demand for food products, agribusiness is one of the most important sectors for maintaining food stability in countries. Agroindustrial activities take place mainly in rural areas and are of vital importance to maintain productivity --without food shortages-- (Herliana, Aina, Sutardi, Lawiyah, & Ulfah, 2019; Yunita & Dhewanto, 2015). For this reason, the capacities of agribusiness and actors at all levels must be strengthened, and opportunities for production, export and transformation of the agricultural sector must be created (Babu, Manvatkar, & Kolavalli, 2016; Herliana et al., 2019; Sánchez & Betancur, 2016). Current challenges include obtaining higher yields and improving environmental performance --taking into account production and pollution problems-- to feed an increasing population in a sustainable manner (Cui et al., 2018).

The concept of agribusiness dates back to the contributions of Davis & Goldberg (1957) who defined it as "*The sum of all operations involved in the manufacture and distribution of agricultural supplies, on-farm production operations and the storage, processing and distribution of agricultural products*". This concept also considers the interaction and influence between the links in the chain. Thus, agribusiness is the management of all activities that include the production, handling, transportation, processing and marketing of agricultural products, integrating technologies and methods in agricultural activities to evolve a primary activity into a value-generating approach (López, 2017). There are large and small, for-profit and nonprofit organizations involved in the production, distribution, marketing or utilization of food, fiber, forest products or biofuels, including those that supply water and collect waste (Van Fleet, 2016). This represents a fundamental link to connect farmers with retailers and consumers (Katchova Ani & Enlow Sierra, 2013).

In recent decades, agribusiness has evolved, and it represents an important activity within the economy.

However, it has been conceptualized according to commodities, large-scale production (conventional agriculture) and minimization of costs and productivity (Olarte Calsina, 2012). Moreover, there is a tendency to highlighting the economic rather than social or environmental importance of agribusiness (Rodrigues Moreira, Kureski, & Pereira da Veiga, 2016). These issues are still pending due to the negative impact generated by this mode of production. Additionally, food, fiber and bioenergy production are connected to issues of food security, global warming, consumer preferences, consolidation of global corporations, environmental impacts, mega trade agreements and persistent problems of food accessibility (Zylbersztajn, 2017).

Thus, a transformation in agribusiness is fundamental nowadays in view of the Sustainable Development Agenda, specifically aimed at responsible production and increasing profitability without additional use of natural resources --this can mitigate trade-offs and enhance environmental synergies--(Hinson, Lensink, & Mueller, 2019). Agribusiness encounters compelling evidence regarding the impact and potential of agroecology as a path towards more sustainable agricultural and food systems. This includes the need of diversified practices and the application of a framework of participation, inclusion and social, economic and environmental justice (Chappell et al., 2018). Such renovation is a way to reconstruct an agriculture that is capable of avoiding widespread food supply disruptions in the future by territorializing food production and consumption (Altieri & Nicholls, 2020). Therefore, the objective was to perform a qualitative and quantitative analysis of the scientific contributions in agribusiness.

2. Materials and Methods

A bibliographic consult was performed in Scopus on January 29, 2021. The word "Agribusiness" was used in a search that showed a total of 5,824 papers from 1955 to 2020. The higher quantity of papers was published in the last year. Based on the objective of the research and the increase of contributions on the subject, a filter was applied for the year 2020. A total of 615 documents were found in the All-open Access, gold, hybrid gold, bronze and green modality from different thematic areas (Table 1).

Table 1
Documents by subject area according to the search term "Agribusiness"

Subjects area	Percentage
Social Sciences, Agricultural and Biological Sciences and Environmental Science	52
Business, Management and Accounting	9
Economics, Econometrics and Finance, Engineering, Arts and Humanities, Energy, Computer Science, Biochemestry-Genetics and Molecular Biology, Decisions Sciences, Earth and Planetary Sciences and Medicine	23
Chemistry, Chemical Engineering, Multidisciplinary, Immunology and Microbiology, Material Science, Mathematics, Veterinary, Psychology, Physics and Astronomy, Neuroscience and Nursing	16

Source: Elaborated with data from Scopus January 29, 2021.

Afterwards, another filter was applied to focus on articles and 407 documents were selected. The excluded documents included: conference paper (140), book chapter (25), conference review (20), review (17), editorial (3), note (2) and erratum (1).

The final database in an Excel spreadsheet (N = 407) contains the authors' names, title, year of publication, volume, number, pages, author affiliations, document type, abstract, link and digital object identifier (DOI). These last two data were used to download the complete documents in PDF format. For each document, a record in a Word file was created with the title, author(s), abstract, keywords and conclusions. For the analysis of the information, a textual analysis of the documents was carried out using *a priori* codes (Gallardo-López, Hernández-Chontal, Cisneros-Saguilán, & Linares-Gabriel, 2018). For this purpose, research topics suggested by Zylbersztajn (2017), in agribusiness, were considered. Codes that emerged in the process of analysis were also included (Table 2).

Table 2
Codes of analysis in scientific contributions based on empirical problems

Research topics in agribusiness (Zylbersztajn, 2017)	Mega trade agreements and institutional harmonization (MTAIH) Farm-level technology pricing and contracts (FLTPC) Market power related to the mega consolidation of companies (MPRM) New agricultural technologies (NAT) Emergence of agrocorporations (EA) Institutional land access rules (ILAR) Property rights regimes and their consequences (PRRC) Private enforcement of property rights (PEPR) Farmer class action studies (FCAS) Territorial reconversion (TR)
Emerging codes	Environmental impact (EI) Human health impact (HHI)

Nvivo 12 software for Windows was used and the content analysis technique was applied by coding textual quotations according to the codes mentioned. Quantitative data (percentages of coded elements and their relationship) and qualitative data (textual codings) were obtained as results.

3. Results and discussion

According to the total number of coded items (N = 831), 24% corresponds to New Agricultural Technologies (NAT), followed by 17% of Environmental Impact (EI), Farmer Collective Action Studies (FCAS) and Market Power Related to Mega Consolidation of Companies (MPRMC) with 14% and 12% respectively. Contributions in Institutional Land Access Rules (ILAR), Private Enforcement of Property Rights (PEPR) and Property Rights Regimes and their Consequences (PRRC) were scarce (Figure 1). These results show: a) the dominant model of production that develops hand in hand with technologies and b) the effects that this form of production has generated on both society and nature. Today, agribusiness is focused on information, truthfulness and insights that allows rapid

developing innovative proposals to be included in this industry. This situation has changed current agricultural technology derived from what is known as the Internet of Things (IoT) (Guo, 2021). This makes improvements possible in agricultural productivity. Although there is a recent debate focused on the effect agribusiness has on environmental quality and questions that this model encourages the expansion of farmland, leading to deforestation and degrading the environment (Alhassan, 2021). An added issue is that of pesticides which cause major environmental problems in the world, contaminate natural resources and the food chain (Ansari et al., 2021). Such concerns encourage farmers to act and at the same time, different types of social conflict, forms of social mobilization and organized collective reactions rise to defend the commons and oppose processes of dispossession and enclosure. This occurs due to the recent phenomenon of large-scale land acquisitions associated with the global agrarian transition (Dell'Angelo et al., 2021). In short, industrial agriculture strengthens its control over diets, species and planetary health, intensifies the processes of enclosure, human displacement and corporate monopolization through financing and digitalization (McMichael, 2021).

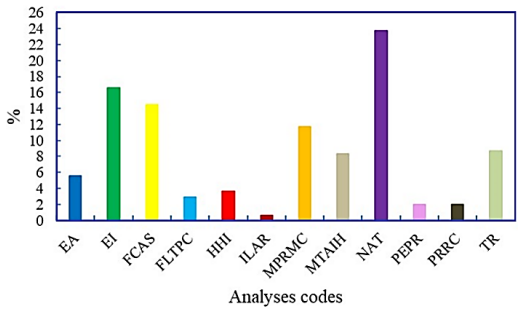

Figure 1. Distribution of coded elements according to analysis codes.

3.1 Contributions of the analysis codes

3.1.1. Emergence of agrocorporations (EA)

The contributions in this code of analysis focus on the ways transnational corporations accumulate power in food production and consumption. These actions that impact involve the impulse of these to guide consumption and its new forms, the effect of large-scale agribusiness on household food security, the promotion of biotechnology-based food and biotechnology policy driven by business-governments, intensive grain sowing, and agricultural cooperatives and financing. One of the main elements for the emergence of agrocorporations is large-scale production as a driving factor (Firdaus & Mandala, 2020). Other aspects are linked to sectoral financing and loaning to finance agriculture, such as the case of the Government of Nepal (Choudhary, Banskota, Khanal, & Gyawali, 2020). Multi-asset agricultural portfolio (Simonian, 2020) and consumer-focused advertising campaigns broadcast by dominant communication media (Manoel Sebastião Alves & Carlos, 2020). This is the result of a historical process that has an impact today, for instance, in China where companies that lobby governments on biotechnology policies and regulations receive verbal or written recognition (Deng, Hu, Pray, Jin, & Li, 2020). In Brazil, agribusiness builds a hegemonic multi/transterritoriality through the corporate use of articulated territories formerly occupied by local residents (Mondardo, 2020). This contributes to the consolidation of agribusiness corporations, but it results in the dismantling of environmental protection policies and populations' land rights (Machado, 2020).

> *[...] The conjunction of the climate, food and financial crises in the late 2000s sparked a renewed interest in farmland and agribusiness investments around the world. This phenomenon became known as the 'global land grab' and sparked debates among social movements, NGOs, academics, governments and international development agencies around the world* (Oliveira, McKay, & Liu, 2020).

3.1.2. Environmental impact (EI)

The negative impact of deforestation for agribusiness expansion (agricultural land and orchards), privatization as well as exploitation of land and natural resources, environmental risks, and intensified use of pesticides are evident. However, measures contribute to reverse this situation, including sustainable energy alternatives that foster social responsibility, conservation of plant species, sustainable management of water resources, management of agroindustrial waste, and environmental education.

Most importantly, economic activity is an engine of financial growth that diminishes social autonomy and generates an unequal distribution of environmental risks (Dorn & Huber, 2020) but incoming of local residents are the most affected (Lemos, 2020). Environmental effects, mainly deforestation, are generated by the territorial expansion of the agribusiness production model (Salizzi, 2020). Governments facilitate these processes considering that they provide inputs for the food industry, i.e., agribusiness in turn finances the policy, producing a dangerous cycle in forest conservation (de Area Leão Pereira, de Santana Ribeiro, da Silva Freitas, & de Barros Pereira, 2020). There are actions to curb the concentration of agribusiness land, for example agroecology that aims to guarantee the farmers' access to land and sustainable production (Acevedo-Osorio & Chohan, 2020). In order to achieve sustainable development and reduce environmental impact, global trends in professional education including the greening of the environment (Mustika, Mohamad, & Dinn Wahyudin, 2020) and agribusiness organizations are already promoting environmentally friendly actions for the present and the future, for example, green accounting (Lee, Liu, & Lin, 2020).

> *[...] Agribusiness is fundamental to human life and eco-innovation is the key driving force for economic and ecological growth. However, in developing countries, setting economic and environmental targets remains a challenge for entrepreneurs* (Ben Amara, Chen, & Hafeez, 2020).

3.1.3. Farmer class action studies (FCAS)

Collective actions generate cooperation and trust, and this synergy makes it possible to achieve common objectives within a productive system to develop small, medium and micro-enterprises. Thus, farmers participate in value

chains at various scales and generate innovation and organization. The findings highlight the leading role of women in agribusiness activities. Other findings are concerned with social capital, cooperativism and alternative forms of production.

Inclusive agribusiness enables smallholder farmers to participate in regional and global value chains, improving their incomings, food and nutrition security (Wangu, Mangnus, & van Westen, 2020). Regarding this, social capital among agribusiness stakeholders is crucial to helping boost the bargaining position of stakeholders (Bulkis, Rosmana, Nuriftitah, & Azizah, 2020). Furthermore, social innovation and entrepreneurial activities contribute to the alleviation of rural poverty where women play a leading role (Osei & Zhuang, 2020). The creation of cooperatives brings developmental benefits to farmers and peasants as well (Pronko, Furman, Kucher, & Gontaruk, 2020). It is important to highlight that farmer carry out alternative practices with agroecological potential against the current dominant model of agriculture (Ameur, Amichi, & Leauthaud, 2020) and generate other forms of income, such as agricultural tourism (Yu & Spencer, 2021). An emerging cross-cutting issue is the mental health of farmers as they struggle with present economic and environmental difficulties (Rudolphi & Barnes, 2020).

> *[…] The resistance of family farmers to the extension of agribusiness is reflected in unique economic, social and technical practices and strategies, which give them specific reproductive capacities* (Rossi, Filardo, & Chia, 2020).

3.1.4. Farm-level technology pricing and contracts (FLTPC)

Contract farming refers to an arrangement between a buyer and agricultural producers that establishes the conditions applicable to the production and marketing of one or more agricultural products. Scientific contributions focus on market contracts whether total, group or adjusted (Mugwagwa, Bijman, & Trienekens, 2020), optimal production and pricing decisions in an agricultural supply chain (Ye, Lin, & Li, 2020). The role of contract farming and differentiation among farm workers in farmland consolidation is also considered (Oliveira et al., 2020).

> *[…] Contract farming generates guarantees to keep farmers' operations vulnerable, while allowing manufacturers to manage the aggregate risks and prices of the supply chain.* (Fu et al., 2020).

This type of contract promotes benefits for both parties (Genoud, 2020). In contrast, contract farming in the Ugandan context leads to forms of expulsion and marginalization of poor smallholder farmers through social differentiation (Martiniello, 2021). Small farmers may perceive contracts as negative, as in Indonesia (Nasution, Aula, & Ardiantono, 2020) where these documents sometimes lack attributes that enhance farmers' capacity for collective action, information gathering and legal defense (Rosete, 2020). For instance, in the Eastern Cape province of South Africa, people receive benefits in the form of jobs and dividends, but the structuring of sharing contracts is not a fair return on investment for traditional owners and generates a labor discipline effect that only benefits agribusiness (Bunce, 2020).

3.1.5. Human health impact (HHI)

The implications of agribusiness on human health led to questioning agricultural practices from production to consumption of products. Scientific contributions support the consequences that have emerged because of such practices. These comprise household nutritional security, pesticide use, exploitation of human resources, social movements in favor of human health, genetically modified crops that demand high amounts of fertilizers and chemical poisons, and watersheds (de Moura, Rozendo, & de Oliveira, 2020; Gray & Nuri, 2020; Hou, Mutuc, Wu, Lee, & Lu, 2020; Minoia, 2020; Sternberg, McCarthy, & Hoshino, 2020; Wangu et al., 2020). Brazil, one of the world's major influences in the agro-industrial sector has health and environmental repercussions in the production of acerola fruit (Silva, Santos, Abud, & Oliveira, 2020). For example, a study conducted in the distant states of Brazil, the authors conclude that overweight and obesity goes beyond individual lifestyle and access to quality food. The situation is related to eating patterns, food markets and anthropological circumstances (Alves, Dal' Magro, Viacava, & Dewes, 2020). Studies of agribusiness personnel's perceptions of the mental health of their farmer clients indicate that they are "stressed" and "depressed" (Rudolphi & Barnes, 2020). Consequently, farmers and ranchers have higher rates of psychological distress and suicide than the general population (Cuthbertson et al., 2020). Another case regarding workforce and health concerns members of an indigenous community in the state of Jalisco, Mexico. The conflict is the long-term environmental and health implications of increased exposure to chemicals, depletion of soil, water, and loss of traditional foods and ways of life (Day, Magaña-González, & Wilson, 2020). In Uruguay, soybean and herbicide-resistant crops are being fostered; hence, endosulfan, glyphosate and aminomethylphosphonic acid were found in soils, fish and beehives in both protected and non-protected areas (Soutullo, Ríos, Zaldúa, & Teixeira-de-Mello, 2020; Terwindt, Morrison, & Schliemann, 2020).

> *[…] Community members are concerned about the long-term environmental and health implications, such as increased exposure to chemicals, soil and water depletion, loss of food and traditional ways of life* (Day et al., 2020).

3.1.6. Institutional land access rules (ILAR)

Institutional rules are embedded within a legal framework on land tenure and define how property rights can be allocated within societies. That is, they determine who can use which resources, for how long, and under what circumstances. Concerning this, some authors question whether in the agribusiness line, sustainability certifications really ensure access to land for local populations. This question is directly examined in palm oil production in Colombia where a human rights approach is lacking (Genoud, 2020). Brazil faces cases of institutional rules on access to land due to the processes of deforestation in Apui, a hotspot of deforestation. Another issue is the

current processes of land use change in this Amazonian development frontier (Carrero, Fearnside, do Valle, & de Souza Alves, 2020). Moreover, the conflict of land and territory on the border between Brazil and Paraguay shows that agribusiness farmers cement a hegemonic multi/transterritoriality through the corporate use of articulated territories on both sides of the border. Thus, their populations struggle and resist the jurisdiction of traditional territories (Mondardo, 2020).

> *[...] Land use regulations are a tool to regulate the use of agricultural land and to establish conditions to safeguard and improve land quality* (Moteva & Marinova, 2020).

3.1.7. Market power related to the megaconsolidation of companies (MPRMC)

Market power is the ability to price consumers above competitive levels and suppliers below competitive levels. In other words, it has to do with the power of the seller and the buyer. This is related to various aspects: consumer behavior and consumption growth, negotiations between suppliers and sellers, exports and imports of products, prices, and competitiveness. Aggressive restrictions by companies on customers to accept what they offer may occur among negotiations (Bansal & Dyer, 2020). Forms of production and impacts of companies are closely scrutinized by society throughout increasing critical judgments (Santos, Moura-Leite, Pereira, & Pagán, 2020). In relation to consumption, food preferences derived from political and economic changes are important as it occurs in Russia (Hovhannisyan, Kondaridze, Bastian, & Shanoyan, 2020). Globalization and the opening of international markets are directing companies to make greater efforts to increase their competitiveness (Kruja, 2020; Vega Martínez, Martínez serna, Parga Montoya, & Bautista Sánchez, 2020). Export strategies and value capture trajectories are also visualized (Hongzhou, 2020; Whitfield, Staritz, Melese, & Azizi, 2020). There may also be agreements between the State and businessmen to favor legislation about pesticides (de Moura et al., 2020). Companies face challenges in trying to translate a problematic past into profit, this is the situation faced by the multinational Monsanto (Hamilton & D'Ippolito, 2020).

> *[...] In Chile, corporations use authoritarian legality, an approach that relies on authoritarian structures and policies within the state, to influence legal outcomes. These cases reveal the mechanisms corporations use to institutionalize their power advantages through the law* (Ipsen, 2020).

3.1.8. Mega trade agreements and institutional harmonization (MTAIH)

This refers to the agreement between two or more countries to comprehensively regulate their trade relations with the purpose of increasing trade and investment flows as well as economic and social development. This arrangement promotes a stable and barrier-free environment for trade and investment and ensures access of the countries' products and services to external markets. Agricultural production in the United States and Europe since the 1930s, and then in the 1970's above in Asia, Africa and Latin America has been referred to as "industrial". It describes how agricultural production resembles industrial manufacturing processes (Flachs, 2020). Thus, emerging and innovative organizational forms are business model associations, business platforms, incubators and centers, public-private partnerships, agribusiness foundations and spin-offs, short supply chains, community-supported agriculture and other community self-organization experiences (Dentoni et al., 2020). Within the European Union (EU) and MERCOSUR (South American trade bloc) governments association, demands have been made to boycott Brazilian products and to withhold ratification of their trade agreement (Rajão et al., 2020). This intensified the potential of the agro-industrial sector for deeper integration in economic relations (Reznik Nadiia & Kudirko Ludmyla, 2020).

> *[...] The EU is characterized by a high level of openness to trade, which increases the vulnerability of its members countries to external shocks from the rapidly changing global environment* (Civín & Smutka, 2020).

China uses food as a foreign policy tool against the U.S. in the context of its trade war (Hongzhou, 2020). Chinese agribusiness companies engage with established systems of private governance in the Brazilian soybean sector, but the engagement is accommodated, contested and shaped in various ways by local realities (Peine, 2021). In the case of NAFTA (North American Free Trade Agreement) between Mexico and the United States, complementarity is displayed without generating losses in the agribusiness of both countries (Osorio-Antonia, Bada-Carbajal, & Rivas-Tovar, 2020).

3.1.9. New agricultural technologies (NAT)

The term "AgTech" is being used worldwide to refer to new emerging technologies applied to the agricultural sector. These technologies are incorporated into production processes. They make it possible to improve crop yields and reduce input and labor costs. These contributions also consider the processes of technology transfer, adoption and innovation by farmers. These include irrigation systems with automatic monitoring (Zeeshan, Sundaraguru, Vijayakarthick, & Kumar, 2020), new plant varieties (Medina-Hoyos, Narro-León, & Chávez-Cabrera, 2020) and germplasm conservation (Dantas et al., 2020), crop yield prediction systems (Doi, Sakurai, & Iizumi, 2020), disease identification techniques (S.Thilagamani, 2020) and plant hormones (Albrecht et al., 2020), precision agriculture technologies (Kolady, Van der Sluis, Uddin, & Deutz, 2020) and food biotechnology (Johnson et al., 2020; Silva Junior et al., 2020; Vasconcelos et al., 2020). Other improvements focus on biodigesters for animal (Franqueto, da Silva, & Konig, 2020), and agricultural waste management (Mendieta, Castro, Rodríguez, & Escalante, 2020) and solid waste management with fungi (Economou, Philippoussis, & Diamantopoulou, 2020). Processes that involve the use of LoRaWAN (network protocol using radio frequency modulation technology) communication network in the context of a farm IoT application are also considered (Annapoorani, Pandimeena, & Amutha, 2020; Miles, Bourennane, Boucherkha, & Chikhi, 2020). Technology has reached not only production processes, but also marketing and post-production processes. Innovations

such as the Farm Fresh Food Box (F3B) have been used to expand farmers' markets, stabilize rural retail businesses and improve access to rural food (Sitaker et al., 2020), digital logistics (Inna, Oleksandr, Olesia, & Revytska, 2020), e-commerce in agribusiness enterprise agility (Lin, Li, Luo, & Benitez, 2020), and blockchain technology in commerce (Lakkakula, Bullock, & Wilson, 2020).

> *[...] Technology transfers improve the performance of small enterprises and help boost rural development. The effectiveness of transferred technology has a major impact on small business competitiveness and access to international markets* (Chege & Wang, 2020).

3.1.10. Private enforcement of property rights (PEPR)

This is the assignment of rights to a private party which may be an individual, a married couple, a group of people, a legal or commercial entity, and a non-profit organization. Regarding agriculture in the rural areas, contributions are oriented towards work in terms of land, labor and ethnicity. These political-economic items facilitate the understanding of the violence and exploitation carried out against groups because of agribusiness development (Ioris, 2020a). There are empirical cases that show how these situations develop mainly in indigenous communities. In Taita-Taveta, a Kenyan city, patrols on the border keep the distance from the local communities, people affected by this claim that the estate expands, taking their properties, roads and rivers and relocates them as illegal inhabitants on what they see as their ancestral land (Minoia, 2020). In Brazil, these confrontations and struggles among parties are relevant to the agency of the Guarani-Kaiowa that emerges from such attachments to places (Ioris, 2020b). In Apui, a Brazilian municipality in the interior of the Amazonas, it is unquestionable how political and economic forces favor the agro-industrial sector, foreshadowing increasing rates of forest clearing for pastureland (Carrero et al., 2020). Therefore, it is evident that government agencies intervene in land use planning, mostly in favor of agribusiness entrepreneurs (Castilla, 2020).

> *[...] The Persian Gulf states are extractive zones; enclaves created through articulation with investor states and the disarticulation of their society. The commodity chains linking these projects to the Gulf economies transfer surplus value in the form of labor time, but also biophysical matter such as water, energy and soil nutrients* (Henderson, 2020).

3.1.11. Property rights regimes and their consequences (PRRC)

Land tenure conflicts develop from the existence of competing claims since land tenure constitutes a network of interrelated interests. They favor dominant interests when a sovereign power has the control to allocate or redistribute land through expropriation. Through overlapping interests several parties receive different rights or complementary benefits (parties with the same interest). Competing interests refers to different parties claiming the same interests for the same parcel of land. Example of complementary interests is the development policy of the multi-million Southern Agricultural Growth Corridor of Tanzania (SAGCOT) that aims to create a healthy environment between agribusiness and smallholder farmers and improve food security and environmental sustainability. Nevertheless, disputes involve bureaucrats, investors and smallholder farmers over access to land and competing visions for agricultural commercialization (Sulle, 2020). Another example is the Russian regional program for the development of the agro-industrial complex. In that context, 217 thousand hectares of arable land and 336 thousand hectares of fallow land not used for the intended purpose and unclaimed by the owners of the land shares will be involved in the rotation of agricultural production (Voronkova et al., 2020). Contract farming schemes are an alternative to 'land grabbing'. They promote inclusive development processes through the integration of small farmers into global agro-industrial production complexes (Martiniello, 2021). Concerning competing interests, studies show how agribusiness leads to a new residential behavior that redefines the local relational system. It also supports the transition from a "peasant" to an urban way of life through the logic of the peasant population expulsion in addition to the logic of agribusiness (Neiman & Blanco, 2020).

> *[...] Dominant interests are perceived when the State grants certain property rights to corporations, an example of which is shown in the accumulation strategies of agribusiness corporations specialized in the land market, the processes and actors involved and the connections made by global financial capital to access the land market and agricultural production in north-central Brazil* (Spadotto, Martenauer Saweljew, Frederico, & Teixeira Pitta, 2020).

3.1.12. Territorial reconversion (TR)

The characteristics of the territorial relocation of production establish concrete functions of each of the spaces that are part of a nation and the role they have in a larger geographical plane. The operational scenarios for international-national capital are related to the displacement of the State in the management of productive processes and the granting of tax and credit subsidies. This also influences the legal reforms tending to strengthen the mercantile business character in all productive activities in the country, this means, the privatization of the national economy. The scientific contributions address issues of dispossession, strengthening of agribusiness and institutional support through public policies developed in favor of agribusiness. The new occupations of communal lands in the dry forest of the northern Peruvian coast where communities have customary rights over thousands of hectares is an illustration of such problems. However, the advances of agro-industrial companies on these territories generate new struggles and the families seek to legitimize the negotiation with the agroindustry and show a progressive loss of communal control of their territory (Burneo, 2020). It seems that the conquest of peoples is associated to the conquest of land, which is reason for resistance to agribusiness all over the world (Gray & Nuri, 2020). Historically, Argentina has been among the world leaders in the production and export of agricultural products. Now, the country faces serious conflicts emerging from trade-offs between the actors involved in the agricultural

sector (Maydana, Romagnoli, Cunha, & Portapila, 2020). Under the present Brazilian administration, measures were implemented to reduce environmental restrictions on cattle ranching. It is the main greenhouse gas (GHG) producing sector and responsible for most of the country's deforestation. The measures favor the expansion of this type of agriculture which in turn provides inputs for agribusiness (de Area Leão Pereira et al., 2020). A study in Kilombero Valley, Tanzania indicates the expansion of agricultural land over wetlands. Local perceptions proclaim that rapid deforestation over the last decade, importing regions and countries where land is leased fail to consider local knowledge, needs and future aspirations (Johansson & Abdi, 2020).

> *[...] Investment and trade policies promote agribusiness but overlook environmental assessments that present social and ecological contradictions. Expressions of power, evidence of how agribusiness practices undermine the potential for sustainable agriculture and rural development, and how agribusiness practices undermine the potential for sustainable agriculture and rural development* (Manda, Tallontire, & Dougill, 2020).

3.2. Relationships between analysis codes

When exploring the relationships between the codes with the highest percentage and the rest of such coding, patterns were found that show the intercessions between codes in relation to the elements coded. This means that according to the coding EI is related to a greater extent with TR (N = 12) and HHI (N = 9). Similarly, the FCAS correlates in a less significant quantity of elements: N = 6 for TR and N = 4 for HHI (Figure 2). There is no doubt that the environmental subject has gained strength and most of the contributions come from *ad hoc* research areas (Table 1). The urge for environmental solutions is a main counterpoint to agribusiness that promotes deforestation and environmental degradation (Alhassan, 2021) generated by the territorial expansion of this productive model (Salizzi, 2020). Moreover, agribusiness has an impact on human health, principally caused by the extensive use of pesticides. Those substances affect the respiratory, reproductive, nervous, hormonal, endocrine and circulatory systems and can cause various health-related problems (Ansari et al., 2021). Certainly, there are actions that are increasingly gaining impetus such as agroecology. This area aims at securing laborers' access to land and sustainable production and to halt the concentration of land for agribusiness (Acevedo-Osorio & Chohan, 2020).

The MPRMC code was mostly related to MTAIH (N = 13). In a similar way, the NAT code was related to MTAIH at a lesser extent (N = 4) (Figure 2). These codes of analysis and relationships show a different picture to that described above in relation to agribusiness. Aspects of market power, new technologies and trade agreements are contested at broader levels. Here, large companies put their greatest effort into expansion, and it is difficult for local forces (farmers) to impose themselves. In other words, they can orient consumption and food preferences according to economics and politics (Hovhannisyan et al., 2020). Aspects that emerge encompasses competiti-veness, exports and imports, and value capture (Kruja, 2020; Whitfield et al., 2020). Conflicts mostly occur between the State and the businessmen (de Moura et al., 2020) within trade agreements and economic relations in general.

Finally, discussing agribusiness nowadays is far from the initial notions based on economic and financial aspects according to a conventional production model. Recently, environmental concerns and farmers' actions are emerging. This is a significant shift from the traditional conception of agribusiness, concerning that even though it considers production operations and other links, value generation and marketing, it is still based on large-scale production (conventional agriculture), cost minimization and productivity. If agribusinesses were understood in a practical way, a current and innovative concept must recognize agribusiness are economic activities derived from or linked to farm products. A new definition needs to recognize that different forms or models of production co-exist and that farmers with diverse economic rationality are introduced in a differentiated manner in the economic and market processes. Additionally, the production-consumption linkage processes should not only focus on the generation of monetary value, but also on the social processes it generates in which multiple actors are involved. A change is required since agribusiness functions encompassed by the concept of agribusiness and the political coordination that dominates the agribusiness market usually operate in an orchestrated manner (Pompeia, 2020). It is also relevant to deliberate on the direction of agribusiness towards the development of emerging economies and market (Sánchez & Betancur, 2016). Addressing challenges related to organizational, governmental and political, global knowledge and financial aspects is equally crucial (Mangla et al., 2021).

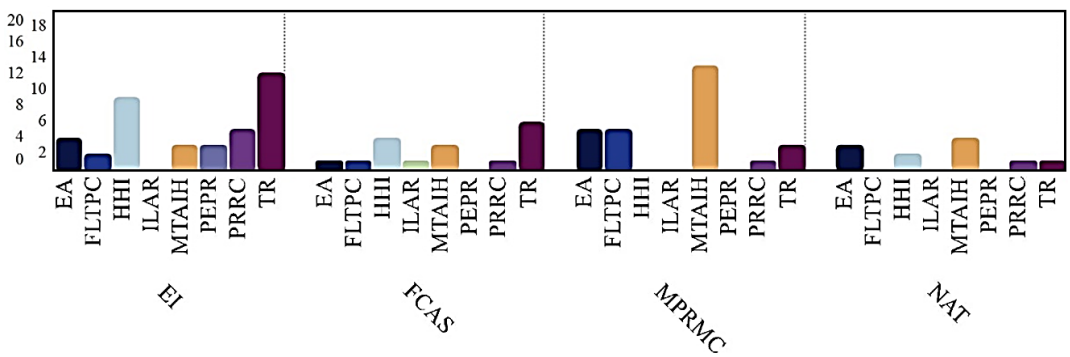

Figure 2. Relationships between analysis codes considering coded elements.

4. Conclusions

Current scientific contributions in agribusiness focus on new agricultural technologies, environmental impact and farmers' actions. These implications have evolved along with the dominant model of production, and because of the effects that this form of production has generated in the interrelationship between society and nature. There has been a qualitative improvement in the contributions of agribusiness, gradually incorporating elements that support the complex processes it fosters. From focusing on economic and financial aspects, agribusiness now considers aspects oriented to sustainability and social commitment -food production-.

Apart from considering consider local aspects of primary production, chains, or links with a regional or strata approach, agribusinesses are also concerned with global aspects that have a resonance in their development: economy, markets, international policies and treaties. Empirical data is needed to show how agribusinesses incorporate the analysis codes applied in this study.

It is suggested that future studies consider the importance of economies of scale, mainly small agribusinesses, as generators of income, employment and food security. The relevance of agroecological production, which promises a new agribusiness model for a new food system, should be considered. It is important to know from the farmers' perspective, how they are inserted in credit schemes, contract farming and in the different market levels. In the context of social demands on the dominant model of production represented by agribusiness, public policy proposals should be generated to achieve sustainability.

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