ISSN: 2359-1048
Novembro 2022

GEOGRAPHICAL INDICATIONS AND SUSTAINABLE DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW

JANE MARY ALBINATI MALAGUTI
ESCOLA SUPERIOR DE PROPAGANDA E MARKETING - ESPM

ILAN AVRICHIR
ESCOLA SUPERIOR DE PROPAGANDA E MARKETING - ESPM

Introdução
Geographical Indications (GIs) are an instrument of industrial property that seeks to distinguish the geographical origin of a given product or service (INPI, 2021). GIs are considered collective tools shaped in the form of a registration that serves to enhance the value of traditional products that are linked to a given territory. GIs possess two main endgames: to aggregate value to a certain product and to protect its productive region (DataSebrae, 2021).
Problema de Pesquisa e Objetivo
These studies do indicate the impacts provoked by the GIs in their locations, however, there are few studies that compile those findings to infer the aspect of business model and how they attend to the SDGs expectations. That is the loophole that this works intends to fill. Given this context, this research attempts to answer the question “How does literature identify the relation between the impacts generate by GIs in attendance of the FAO sustainable development parameters and the Sustainable Development Goals of the 2030 Agenda.
Fundamentação Teórica
Sustainable Development and Sustainability.The United Nations defines the concept of sustainable development as: (UN, 1987: 39): “Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. To exist not only sustainable economic growth, but develop, it is necessary the fulfillment and the satisfaction of human’s basic needs (Sachs, 2004), solidarity with future generations, making the involved population to participate in this emancipatory process, saving natural resources.
Metodologia
The methodology of this work is based on the procedures proposed by Gaur & Kumar (2018). These authors suggest four steps for the analysis: data collection, coding, data analysis and data content interpretation. The keywords utilized for the database researched were: “geographic* indication” OR “protected designation” and “sustainable*development” OR “economic* impact” OR “environmental*impact” OR “social impact”.
Análise dos Resultados
The results show that out of the 17 SDGs present on 2030 Agenda, the only one that is not reported by any article is Objective No 14 “Conserve and sustainably use the oceans, seas and marine resources for sustainable development”. The next session will report how each SDG is reported in the examinate cases.
Conclusão
The scientific literature identifies overall positive impacts for the SDGs concerning the branding and utilization of GIs as a production model, even though there are also considerable side effects, and some GIs are more harmful to society, the environment, and the economy. Another point to pin out is that not all GIs can produce results in all the three Sustainable Development feet. Negative impacts or negative with reservations appear in 29,16% of the cases analyzed in juxtaposition of 70,85% of positive outcomes.
Referências Bibliográficas
Agenda 2030. (2015). Plataforma Agenda 2030. Disponível em: . Acesso em abril, 2021. Bardin, L. (2006). Análise de conteúdo (L. de A. Rego & A. Pinheiro, Trads.). Lisboa: Edições 70. Barrera, A. G. (2020). Geographical indications for UN sustainable development goals: Intellectual property, sustainable development and M&E systems. International Journal of Intellectual Property Management, 10(2), 113-173.

Palavras Chave
Geographical Indications, Protected Denomination Origin, Sustainable Development Goals.

Agradecimento a orgão de fomento
Agradecimento a CAPES

GEOGRAPHICAL INDICATIONS AS INSTRUMENTS FOR SUSTAINABLE DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW

Abstract. This article's objective is to assess how the academic literature portraits the impacts of activities Geographical Indications (GIs) regarding Sustainable Development and the United Nations (UN) Sustainable Development Goals (SDGs). The *Scopus* database was the main source of data collection, after screening the articles there present, 29 of them were considered relevant for sampling. The UN definition for the SDGs provided the evaluation criteria on sustainability. The results show that more than half of the analyzed articles sustain that GIs have a predominant positive impact on sustainable development whereas almost a third of them point to the other way. This research contributes to the academic literature by showing what is the mainstream position of academics regarding the impact of the GIs on economic, social, and environmental development. More than that, the article sums up the main points where this literature points out positive and negative impacts. This critical synthesis can guide entrepreneurs, public policy formulators and managerial supportive organs of foment to understand the sustainable status of GIs and how to better handle this kind of business to maximize rights and positive outcomes while diminishing the main source of mistakes that generate negative outcomes to those business and society.

Keywords: Geographical Indications; Sustainable Development; Protected Denomination Origin; Sustainable Development Goals; Economic Impact; Social Impact; Environmental Impact.

INTRODUCTION

Geographical Indications (GIs) are an instrument of industrial property that seeks to distinguish the geographical origin of a given product or service (INPI, 2021). GIs are considered collective tools shaped in the form of a registration that serves to enhance the value of traditional products that are linked to a given territory. GIs possess two main endgames: to aggregate value to a certain product and to protect its productive region (DataSebrae, 2021).

Basically, GIs are utilized to identify regions that have its reputation intertwined with a specific product with notorious quality and differentiated aspects. This connection between product, place and those that inhabit the location is a patrimony that must be preserved and that have their own market value due to their tradition, as much as the growing interest that consumers attribute to it. Consumers are becoming increasingly more interested in the quality and social, environmental, and economic impact of the goods that they choose to buy, as much as the conscience of buying local and respecting the idiosyncrasies and regional habits (FAO, 2009-2010).

The Food and Agriculture Organization of the United Nations (FAO) considers that the GIs can generate sustainable development in agri-food system if only they manage to also contribute to economic development and food security (Vandecandelaere et al., 2018). However, to this development to become a sound reality, it is necessary for it to embrace social, environmental, and economic aspects (Sachs, 2004).

In 2015, by consensus, world leaders agreed on a worldview on the future of mankind regarding sustainability. The 2030 Agenda is a joint deliberation of an action plan composed by 17 Sustainable Development Goals (SDG). Those head of states also committed to 169 indivisible and integrated goals that merge in a balanced way the three dimensions of sustainable development, the economic base, the social and the environmental (UN, 2015). In that sense, (Barrera, 2020) says that the GIs are a way to achieve such goals.

Most studies regarding GIs and the relation of these products with rural development emphasize the economic aspects of the business model. Despite the recent increase of research on this area, the focus is still predominantly in the economic and social aspects of it, leaving environment as a secondary interest, thus, making the pool of research that specifically gather the GIs and the SDGs not that wide (Kimura, & Rigolot, 2021).

These studies do indicate the impacts provoked by the GIs in their locations, however, there are few

studies that compile those findings to infer the aspect of this business model and how they attend to the SDGs expectations. That is the loophole that this works intends to fill. Given this context, this research attempts to answer the question "How does literature identify the relation between the impacts generate by GIs in attendance of the FAO sustainable development parameters and the Sustainable Development Goals of the 2030 Agenda.

THEORICAL FRAMEWORK

GIs relevance in the global context.

GIs are turning into a global phenomenon, there are approximately eight thousand recognized IGs in the world, out of those, two thousand are in China, about one thousand in the Americas including the United States and over three thousand and three hundred in the European Union (OriGin, 2019).

Agro-industrial goods and beverages protected by European Union's GIs legislation represent a 75 billion Euro worth in products and over a fifth of this amount results in international exports. (European Commission, 2020).

The European agriculture commissioner Janusz Wojciechowski has stated:"European Geographical Indications reflect the wealth and diversity of products that our agricultural sector has to offer. Producers' benefits are clear. They can sell products at a higher value, to consumers looking for authentic regional products. GIs are a key aspect of our trade agreements. By protecting products across the globe, we prevent fraudulent use of product names, and we preserve the good reputation of European agri-food and drink products. Geographical Indications protect local value at global level." (European Commission, 2020).

In developing countries, the utilization of such a mechanism is only being fostered in recent times. For instance, in Brazil, the IGs are just recently being discussed and recognized as relevant factors for strategic development. Even though this process can add value to goods and services, promote local culture and niche tourism, adding to regional sustainable development (RIMISP, 2006).

Until May 2021, Brazil has registered in its national institute for Industrial Property "Instituto Nacional de Propriedade Industrial (INPI)" a total of 77 GIs. Federal Law No. 9.279, from May 14th, 1996, known as "Industrial Property Law" or (LPI), defines two species of GIs in the country: The Origin Denomination (OD) and the Precedence Indication (PI).

Origin Denomination refers to the geographical name of a country, region, city, or any locality that designs a service or product to which it's characteristics or attributes are exclusively or essentially to a geographic mean, including human factors, natural resources, or cultural reasons (INPI, 2021).

A precedence indication is related to the geographical name of a region or site that has become known as a center for its manufacturing, harvesting, extraction or any sort of production model of a given product or service (INPI, 2021). In terms of legal property industrial right, both PI and OD hold the same hierarchical level.

GIs and SDGs.

A GI is an authenticity label given to those goods and services due to their specific origin that in the end distinguishes them from similar competitors that are out in the market. This label is used in several countries with the goal of national market protection and differentiation (Mafra, 2008).

The presence of GIs in developing countries has been the object of study in a large array of disciplines, but fundamentally, in business and those concerned about the acceleration of economic development. (Chabrol et al.2015) argue that the GIs integrate collective production characteristics, a feature that serves as an organizational mechanism that adds aggregate value both in the production and the marketing dimension.

Sustainable Development and Sustainability

The United Nations defines the concept of sustainable development as: (UN, 1987: 39): "Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

To exist not only sustainable economic growth, but develop, it is necessary the fulfillment and the satisfaction of human's basic needs (Sachs, 2004), solidarity with future generations, making the involved population to participate in this emancipatory process, saving natural resources as to preserve the environment whereas elaboration a social system that guarantees jobs, social security and respect to other cultures and etc.

Sustainability is based on a tripod: social, economic, and environmental (Elkington, 1998). Environmental sustainability is referred to development in balance with nature through de maintenance and conservation of the ecosystems and the biodiversity, social sustainability goes for social development that aims a bigger equality and the upgrade of social levels of entire populations and cultures whereas economic sustainability treats of de economic development linked to maintenance and endurance of the productive system that generates material comfort, well-being and quality of life in the long run regarding the workforce, the national companies and the productive system as a whole.

Even if a territory has a considerable economic growth, it is not enough for the three dimensions of sustainable development to fully fulfilled. It also doesn't mean that that the population there located will absorb in an homogenic way, or even at all, part of this economic growth. On the contrary, economic growth without sustainable development may generate on the long run economic turmoil, social segregation and severe Ambiental damage, thus, economic growth and sustainability is key for any region or nation to progress, but it cannot be chased at all costs (Ramos, 2015).

To achieve the objective set, achieving a development that is in pair with the three dimensions proposed by the UN, the 2030 was designed with a set of programs to guide the fight against poverty and hunger for the fifteen years that follow the agreement.

The 2030 Agenda was ratified in September of 2015 in New York City, after long rounds of debates, meetings between delegations of every member-state of the UN. In it, the agreement held by the parts to walk the path to a sustainable development in the whole plane is reinforced.

"We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path. As we embark on this collective journey, we pledge that no one will be left behind" (UN, 2015: 2).

METHODOLOGY

The methodology of this work is based on the procedures proposed by Gaur & Kumar (2018). These authors suggest four steps for the analysis: data collection, coding, data analysis and data content interpretation. The content analysis consists in set of procedures of technical communications and systematic procedures alongside an objective description of content (Bardin, 2006).

Data collection and coding

The data collection was made utilizing the Scopus Database. This tool was chosen because it is the largest peer reviewed database available in the fields of Management, Organizations, Social Sciences and Business (Hossain, 2018).

After the base was selected, the following analytical cleavages were applied: The timeframe analyzed comports articles written in the last sixteen years, specifically between 2005 and 2021was considered. The keywords utilized for the database researched were: "geographic* indication" OR "protected designation" and "sustainable*development" OR "economic* impact" OR "environmental*impact" OR "social impact". The presence of those keywords was at first checked in titles and on the abstracts, no other research filters were applied, nor other scientific research areas served as base.

The first endeavor resulted in seventy-four articles that were feasible for further investigation. Reading the abstracts was the first methodological approach to such vast array of articles to be considered. Out of those seventy-four articles forty-five were discarded due to a poor adherence to the object studied or due to a low academic relevance. This process resulted in a sample of twenty-nine articles to be investigated.

Codification is a fundamental element for achieving research excellence (Strauss, 1987). This process was basically conducted by manual content analysis, meaning that no IT device nor any software was applied in the process. Following (Gaur, & Kumar, 2018) recommendations to split up the coding and the classification steps in two separate works that were later gathered by the impact evaluation.

Social, environmental, and economic dimensions were later coded based on the former SDGs standards presented earlier in the theorical framework. Elkington (1988)

To assess and codify the impacts of the GIs, (Milles, Huberman & Saldana, 2018) punctuation model was utilized. Its evaluative punctuation spectrum varies from -1 to +1. Positive numbers indicate positive outcomes regarding adherence to the SDGs while negative grades show otherwise. Zero might also be attribute if the research points no positive nor negative result for the GIs. Table 1 shows better describes this standardization.

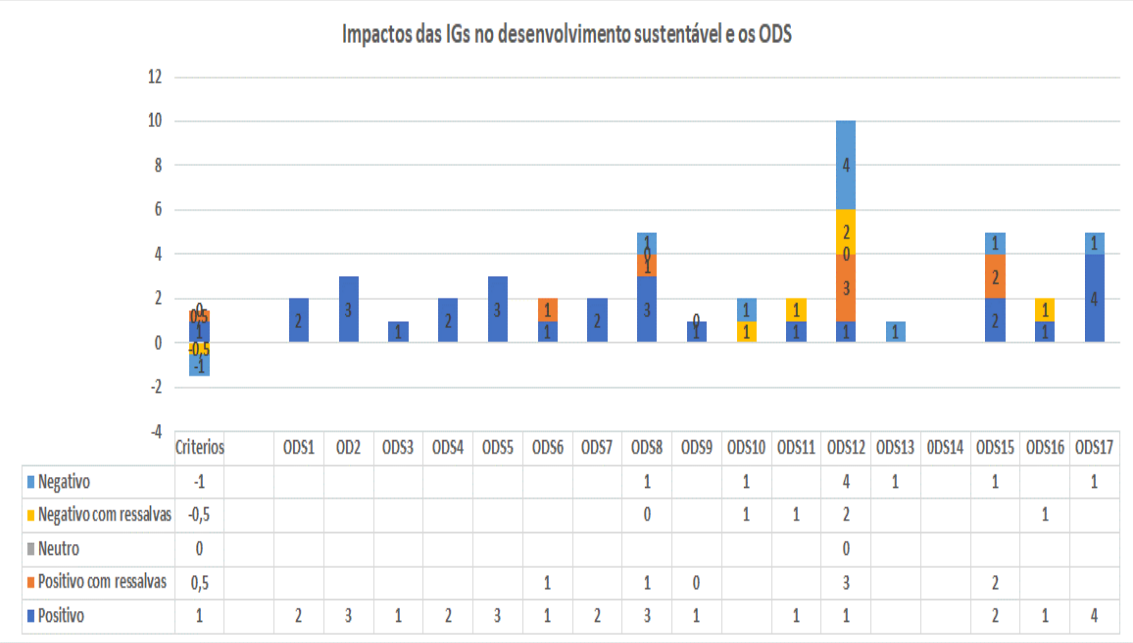
Table 1. Criteria for coding the GI impacts into the three SDGs Dimensions.

Social/Economic/Environmental Dimensions	**Punctuation**
Positive Impact: The author takes the position/gives evidence that the GI does contribute positively for sustainable development.	**1**
Positive Impact with reservations: The author assumes the position/gives evidence that the GI does contribute positively for sustainable development, however states that there are reservations and overall exceptions for it.	**0,5**
Neutral Impact: The author is neutral or does not report any impact on the actions of a given GI concerning sustainable development, or reports that both negative and positive impacts happen at the same intensity.	**0**
Negative impact with reservations: The author assumes that the predominant impact of a given GI is negative or tends to be negative even though some minor positive impacts might occur.	**-0,5**
Negative Impact: The author has a negative view concerning a given GI and its contributions or impacts in the sustainable development.	**-1**

Source: Elaborated by the author (2021)

Results

Graph 1. Results for the GIs impacts on sustainable development according to the SDGs.



Criterios	ODS1	OD2	ODS3	ODS4	ODS5	ODS6	ODS7	ODS8	ODS9	ODS10	ODS11	ODS12	ODS13	ODS14	ODS15	ODS16	ODS17
Negativo	-1								1		1		4	1		1		1
Negativo com ressalvas	-0,5								0		1	1	2				1	
Neutro	0												0					
Positivo com ressalvas	0,5							1		1	0		3			2		
Positivo	1		2	3	1	2	3	1	2	3	1		1	1		2	1	4

The results show that out of the 17 SDGs present on 2030 Agenda, the only one that is not reported by any article is Objective No 14 “Conserve and sustainably use the oceans, seas and marine resources for sustainable development”. The next session will report how each SDG is reported in the examinate cases.

SDG 1 – Poverty eradication

kimura and Rigolot (2021) attest that Mishina Breisho Potato that is originally from Mishina in Japan has greatly contribute to the creation of jobs for women, people with special necessities, Asperger individuals in the field crops and the production process of the potato.

Wang et al. (2021) verify that this GI has also cultivated as a secondary product the Gentiana Flower, in a cooperative form, an action that reinforces the trend in this region to join work efforts with the local population, that promotes technological efficiency but overall is targeted to reduce poverty in vulnerable minorities.

SDG 2– Zero Hunger and Agricultural Sustainability

Studies of the sample show positive impacts of some GIs in this specific SDG. Vecchio et al. (2020) found that the Carité Butter has had an important impact in rural communities in South Ghana, generating wealth that has diminished hunger in those traditionally poor areas.

Suh e MacPherson (2007) report that in the six years since the formalization of Boseong Korean Green Tea as an GI, the local production of tea has doubled and the number of tourists that visit the region has tripled, fact that gave a margin for the producers to increase prices over 90%. This is perhaps the main example of the institutionalization of an GI to promote great impact in local economy and the fight against poverty, even though South Korea is a country in better economic conditions than Ghana, there still are problems like inequality, poverty, and the marginalization of minorities.

Bérard e Marchenay (2006) consider that the GIs bring important contributions regarding the preservation of local flora and local ecosystem. According to the authors, the good usage of GIs preserves landscapes, make the agribusiness more sustainable since the regional aspect of this business model does not require massive changes in the soil for it to sustain a plant the is exotic to that region.

SDG 3 – Secure a healthy life and promote well-being for every individual at all ages

Kimura e Rigolot (2021) address that the production process of Mishima Potato utilizes air drying, which enhances the nutritional value of the product and makes it more useful for upgrading the alimentation of vulnerable groups, as much, an example of an GI that both contribute for a healthier life since those potatoes are better for health than the traditional English potato, while also attending to vulnerable groups such as elders a individuals with metabolic condition, thus attending to a social dimension to(Elkington, 1998).

SDG 4 – Education and Quality

Charrouf & Guillaume (2018), while analyzing the Argan GI of Morocco discovered a joint program in this good intertwined to the creation of a program to fight women illiteracy in the region.

Kimura e Rigolot (2021) point that the potato processing that operates in the Mishima products already sell their products and snacks for public schools. Since they focus in the usage of healthier potatoes and products for snacks, while still being attractive for kids, the GI uses the nature of their product to teach about a balanced and healthy diet and also use their farms and plantations to make expeditions to teach those kids about the relevance of agribusiness and a correct diet, or as they say, they forge "The next generation of consumers".

SDG 5 – Achieve gender equality and empowering women and girls.

Three articles point-out to positive impacts of the GIs in this branch of social sustainable development. Again, the Argan Oil studied by Charrouf e Guillaume (2018) in Morocco is an example of an GI that the production of this product has allowed rural areas to develop and, in that case, through female cooperatives created to foster the planting of the argan fruit and later the development of the final product. The income generated by these cooperatives allowed Moroccan females to invest in education and professional qualification for themselves.

Kimura e Rigolot (2021) observe that the Mishima Potato GI also empowered local Japanese female farmers. Vecchio et al. (2020) approach the Carité Butter GI in Ghana also reveals how those products have been able to empower local communities, either by alleviating hunger and helping to break the poverty trap, or to also allowing those women having resources to invest in themselves regarding professional qualification.

SDG 6 – Ensuring the availability, sustainable management, and water sanitization for all.

Hoang et al. (2020) studies on the Cao Phong Orange GI, in Vietnam, is a case where local producers have managed to significantly increase their production and product quality by utilizing a sustainable approach to farming and agricultural production itself. The locals were conscient to preserve the local natural resources like water, the soil, for maintaining the characteristics of the products while the rational usage of them. This is an indicative of fulfillment of the environmental, economic, and social correct usage of the GIs (Elkington, 1998).

The Flinzberg et al. (2020) study on GIs found out a general positive impact, with reservations, of the Brazilian GIs in terms of sustainable development. They claim that the GIs are one of the best options for branding products of agroforest origins. However, they also consider that the initial costs and the lack of awareness and conscientization regarding consumers to agroforestry products are very high and that negatively impacts the GI procedure.

SDG 7 – Securing reliable, sustainable, and modern access to energy for all at an accessible cost.

Concerning the Argan Oil, Charrouf & Guillaume (2018: 2) state that: "building a cooperative was more than bringing some amount of financial independence to women, it was also bringing new means of communication, new roads, and often a long expected reliable access to electricity". Kimura & Rigolot (2021) also demonstrate the favorable impacts of the Mishima Potato GI on reducing energy costs by

adding manual harvesting without the use of machinery and the natural air drying of the products that takes one to two weeks to happen.

SDG 8 – Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Two articles show positive impacts in this SDG, another one reports a positive impact with reservations while another one shows negative impacts of GIs in sustainable development. Kimura e Rigolot (2021) show how young farmers from the Mishima Bareisho GI are forming "Nomins" groups, that work together to fabricate high quality goods through information exchange, that encourages every producer to take risks in product development. Beyond that, the GI has been able to promote local tourism as more and more people started to visit the region to know the product and the productive system. The considerations of Charrouf e Guillaume (2018) about the Argan Oil show that because of the research investment made to promote and understand the functionalities of this oil that is both edible and useful for the confection of beauty products and that has a high commercial value. The findings of the properties of the oil made European cosmetic industries start to demand the product and that helped the GI to thrive.

The Italian Olive Oil GI studied by Menozzi (2014) is remarked as of being of positive effect with reserves. The authors refer to specific issues that must be faced by the producers of the region, like the lack of technical assistance and coordination between them. There also isn't a formalized consortium that formalizes rules and practices that guarantee the quality of the products of each individual supplier, thus, there is also no cooperation and engaged production between the parts.

On the other hand, Vakoufaris (2010) indicates a negative impact regarding economic sustainability of the Cheese due to the incapacity of the in promoting cooperative actions then failing to achieve the full potential of a product of protected origin despite the growing demand said to happen in the research, thus making the Lesvos Greek cheese yet to be successful.

SDG 9 – Industry, innovation, and infrastructure

Samper e Quiñones-Ruiz (2017) point to positive impacts for GIs regarding sustainable development and more specific to the SDGs. The authors show how the Coffee GI that belongs to the coffee industry in Brazil and this industry is in position to lead e show significant progress by suppling the necessary scale for the transformation industries that walk alongside this differentiated coffee market. This reality not only helps local societies and small farmers to progress but also demonstrate a clear way on how this joint business can generate economic sustainability (Elkington, 1998).

SDG 10 – Inequality reduction. To reduce inequality within countries and between them.

Two papers show negative impacts of the GIs related to this SDG. Bowen (2010) points out how the Mexican Agave GI connected to the tequila industry failed to fructify its production model to attend the local economy, local society, and the environment.

Because of the lack of a strong legislative support and the inability of the Mexican state to supervise abuses that were committed within this GI industry, small farmers became poorer even when the product was still profiting, due to lobby and political manipulations, the Mexican government only helped the industrial part of the process and made the local inequality even larger, and poverty remained high in those areas.

Ghosh (2016) reveals that the rural population of the Indian Himalaya has suffer for years against from the competition of their local products against fake sellers. Such a poor and needy community has seen for ages their economic level decline and the author proposes the utilization of the GI system to certify the products of the locals so that they may outcome the difficulties. They are unable to compete in local and international market despite having good products, the fake ones are cheaper and have a centralized distribution core.

Those are clear cases where the GIs did not contribute to any sort of sustainable development, those were only capable of increasing poverty and inequality due to bad governance, corruption, and lack of technical support for local producers.

SDG 11 - Cities and sustainable communities. Turning cities and human settlements into safe, resilient, sustainable, and inclusive ones.

Barrera (2020) believes that social cohesion derived from the collective dimension from the GIs model may capacitate marginalized communities and thus lead into a better community integration. This is also the case of the Himalaya case portrayed above.

This is a positive impact that relates to the social dimension of SD while another negative impact with reserves was also demonstrated.

SDG 12 Responsible production and consumption

Kimura & Rigolot (2021) report that the Mishima Potato GI has managed to contribute towards a more responsible production and consumption process. The potatoes are cultivated in mountain areas that are not normally prone for this sort of culture, the agricultures don't use machines in their harvesting, even the soil digging is made with the help of manual tools. This productive process does not use fossil fuels nor pollutes the air. León-Bravo et al. (2021) studied the supply-chain of Grano Padano cheese in Italy, a certified GI.

The authors consider that the evaluation and sustainability were hardly implemented, even thought the steps of doing so are clear in the literature and that that was the case of the Italian cheese. Due to bad evaluation process of that supply chain. In the same perspective, Falcone et al. (2015) considers that despite the agri-food sustainable questions had been somehow developed and strengthened considerably for some time now, in the operational point of view, sustainable agriculture is still evolving, hence systemic production upgrades and research are increasingly necessary.

Belletti et al. (2017) indicate that environmental concerns are not considered in great measure in the product specifications because those result in the necessity of achieving greater and more specific quality standards of the sold product. Laurent et al. (2017) argue about the necessity for the cheese food value chains to review their specifications regarding environmental protection, specially at the farm level and in the meadow management, water, and some other resources. The authors concluded that environmental protection should not be sought after in detriment to economic or social sustainability.

Millet et al. (2020) also analyzed that the Corsigan Grapefruit in France. By being harvested before reaching its biological peak to achieve a better aesthetic that was demanded by the consumers, the food waste was very high, the productive costs were also high. This model diminished economic profits, created a grave environmental issue and did not produce any relevant social impact, thus being a example of a negative contribution of a specific GI.

There is a clear negative impacts section highlighted by many authors in the European milk and cheese GI, mostly concerning environmental bad impacts that despite their greatly economical evidence create unfavorable impacts. In this sense, Famiglietti et al. (2019) also diagnosed that cheese production generates major environmental impact, water waste, soil damage, high CO2 emission and a great energy consumption. Bava et al. (2018) reinforce the need for the cheese factories to make efforts for managing the environment and the damages made by cheese that could be achieved by technical support and good practices internalization.

Dalla Riva et al. (2018) go even further and say that sustainability in dairy sector is known to be a issue globally and that managing this specific Gordian Knot is a good movement towards preserving the environment since milk is one of the most worldwide consumed products in the whole world. González-García et al. (2013) state that a special focus should have been placed in three specific steps: the smoking process, the system heating and residual water treatment steps.

Every impact reported by Elkington affected the environmental dimension and reinforce the need for evolving this specific SDG.

SDG 14 – Action against climate change. Taking urgent measures for fighting climate change and global warming

While analyzing the Italian Asiago cheese IG, Dalla Riva et al. (2018) point to negative impacts. The

authors evaluate environmental impacts upon the manufacturing of this cheese, where the most important damage resides in the raw milk transformation, that requires great amounts of energy and fossil fuel that reverberate in the depletion of the ozone layer, climate change and increasingly energy demand, soil acidification and because of that it became clear that this GI also does not contribute to SD and achieving the SDGs (Elkington, 1998).

SDG 15 – Life on Earth

Charrouf and Guillaume (2018) report favorable impacts from Morocco's Argan Oil GI that combined integrated sustainable development with socioeconomic progress, with the strategy of developing actions to protect the Argan forest in Morocco. Kimura and Rigolot (2021) show that Japan's Mishima Potato GI encouraged farmers to preserve local specialties and use land in cold, mountainous regions. Sinisterra-Solís et al. (2020) assess the GI of Spanish wine Utiel-Requena, pointing out favorable impacts with reservations, stating that regardless of the type of grape cultivation, organic systems are more environmentally correct than conventional ones. Egea et al. (2016) analyze the Spanish olive oil producing GIs and report the importance of the sector and the need for local governance to contribute to improving the sustainability of rural areas, encouraging innovation and entrepreneurship, as well as the expansion of organic and integrated production systems.

Sanz Cañada and Macías Vázquez (2005) point out negative impacts of the GI of olive oils from Serra Magina, considering soil erosion as a number one environmental problem in olive growing. The intensification of production led producers to adopt a productive paradigm of maximizing production at any cost, with excessive use of fertilizers and synthetic plant protection products that harmed the environment, in particular the soil and aquifers.

The research by Charrouf and Guillaume (2018) shows that the studied GI meets the three dimensions of sustainability (Elkington, 1998) and is related to this SDG. Other studies point to the fulfillment of the environmental and economic dimension, however, the negative aspect indicated by Sanz Cañada and Macías Vázquez (2005) shows that the profitability arising from the olive growing activity is placed above this dimension, as well as the others. Therefore, it is necessary to look for ways to minimize the reported negative impacts.

SDG 16 – Peace, Justice and Strong Institutions

Barrera (2020) considers that GIs contribute favorably to strengthening peace, justice, and strong institutions through the establishment of a national legal framework of characterized GIs, which can be a strong association mechanism that emerges, organizes and defends the collective dimension of IG. Nuary et al. (2019) report unfavorable impacts with caveats on the Salak Pondoh Sleman GI by noting that farmers are required to register their land with the Sleman Department of Agriculture, Food and Fisheries to meet the traceability requirement if they want to internationalize. After registration, the farmer is entitled to a special certificate, however, only about 20% of the groups of farmers in the observed area had the certificate. The low number is caused by the high standard of export quality and the reluctance of farmers to comply with administrative requirements.

Note that GIs do not directly contribute to the sustainable development of this SDG, but issues relating to the formal institutional environment (North, 1997), especially the regulatory environment (Scott, 2014). In this sense, for this SDG it is necessary to develop the three dimensions of sustainability (Elkington, 1998).

SDG 17 – Partnerships and means of implementation

Positive impacts are noted in the following articles. Charrouf and Guillaume (2018) show that Morocco's Argan Oil GI helped create cooperatives in rural areas, an expensive project that was made possible thanks to the initiative and governmental and non-governmental subsidies. Hoang et al. (2020) consider that the support of the government of Hoa Binh province, as well as the recognition and GI protection of the Cao Phong orange in Vietnam contributed to the conservation of biodiversity and traditional culture in the local areas.

Kimura and Rigolot (2021) show that the processing company that produces the Mishima croquettes buys class B potatoes, without decreasing the price from farmers, which contributes to their economic support. Belletti et al. (2015) shows how much GI products affect public goods through names/identifiers, such as products, institutional rights, and definitions, etc. For the authors, it is necessary to analyze which aspects and which public goods are connected to GI products to justify their regulation, so that it is more efficient to support GI production systems. Bowen's (2010) study points out as negative impact the lack of strong GI legislation in Mexico substantially undermines the potential for GIs to help small farmers and contribute to rural development.

The studies analyzed together show that the social, economic, and environmental dimensions are reached (Elkington, 1998) and once again denote the importance of a well-developed institutional environment for achieving this SDG.

Note that GIs do not directly contribute to the sustainable development of this SDG, but issues relating to the formal institutional environment (North, 1997), especially the regulatory environment (Scott, 2014). In this sense, for this SDG it is necessary to develop the three dimensions of sustainability (Elkington, 1998).

DISCUSSION

The application of the criteria addressed at Table 1 resulted in the finding of 48 impacts reported by the authors of the 29 articles. Twenty-seven have shown only positive impacts (+1); seven articles point to positive results with reserves (+0,5); none has shown a neutral outcome (0); five articles addressed negative results with reserves and finally nine articles have shown negative impacts of the GIs

Table 2 synthetize these findings.

Table 2. GI impacts in the Sustainable Development regarding the SDGs.

Positive Impacts (+1)	27	56,25 %
Positive Impacts with reserves (+0,5)	7	14,58%
Neutral Impacts (0)	0	-
Negative Impacts with reserves (-0,5)	5	10,41%
Negative Impacts (-1)	9	18,75%
Total	48	100%

Fonte: Elaborated by the author (2021).

For a development to be considered “sustainable”, it is necessary for the three dimensions to be attended (Elkington, 1998; Sachs, 2004). It is verifiable that even though many studies show some form of positive sustainable impact in regional societies, not always the three dimensions are present. Apart from that, it turns out that even when the three dimensions are present, many times this presence occurs when the analysis englobes more than just one producer GI, but a union of GIs efforts and even considering different products that work together.

A few samples of the analyzed GIs can fully and effectively develop the complete SD Tripod. The main examples in our analysis were the Cao Phong Orange Vietnamese GI, (Hoang et al., 2020), the Morocco Argan Oil (Charrouf, & Guillaume, 2018), the Carité Butter in Ghana (Vecchio et al., 2020) and the Mishima Potato in Japan (Kimura, & Rigolot, 2021).

These results confirm that GIs may support sustainable development in agri-food industry, (FAO, 2009-2010; Sachs, 2004; Vandecandelaere et al., 2018) and help many of the SDGs to be achieved even if not every GI is able to foster every single SDG itself. Based on these results, it is advisable that future analysis of other GIs so that the broad understanding on the nature if this business model is advanced since there is not so much available research on the field. It is necessary to understand the best pathway for the GIs to fully thrive. The analyzed GIs contribute to a negative form for sustainable development in goals 10, 12, 13 and 16 of the 2030 Agenda. Because of that, it is necessary for future research projects

to figure out the source of this issues, whether there is any pattern for failure and what measures can be taken to avert those negative outcomes. The results found to SDGs 10,16 and 17 have highlighted the necessity for developing future studies in the business field that should support a further implementation of this business model and what can be done regarding this.

CONCLUSION

The scientific literature identifies overall positive impacts for the SDGs concerning the branding and utilization of GIs as a production model, even though there are also considerable side effects, and some GIs are more harmful to society, the environment, and the economy.

Another point to pin out is that not all GIs can produce results in all the three Sustainable Development feet. Even when they achieve one or two of those dimensions, the impacts that follow are mostly positive or generate positive outcomes with reservations.

Negative impacts or negative with reservations appear in 29,16% of the cases analyzed in juxtaposition of 70,85% of positive outcomes.

GIs could become strategic tools to promote sustainable development in regional efforts. Endeavors to enhance the GI business model are still deeply necessary, the way that they are implemented and managed in time, a 29% gross margin of negative outcome is still high enough to create concerns, but the clear positive majority of outcomes points to a bright future, since authors normally point that the bad outcomes come either because of bad public policy and government relations, or due to lack of professional training for the locals.

To finish, it is also made clear in the research that the economic sustainability part is still the most fetched SD feet for the companies, thus the most observable by the research of the GI field. Social and Environmental dimensions are gaining ground being the latter the least prestigious of the two. Full sustainable development will not come if all of dimensions are taken into consideration, since accomplishing standards and tees in one or two of them is not enough. What this research has found out that according to literature, GIs can help in the directing of the SD efforts given that a better method for GI elaboration and implementation is developed.

REFERENCES

Agenda 2030. (2015). *Plataforma Agenda 2030*. Disponível em: <http://www.agenda2030.org.br/participe/eventos>. Acesso em abril, 2021.

Bardin, L. (2006). *Análise de conteúdo* (L. de A. Rego & A. Pinheiro, Trads.). Lisboa: Edições 70.

Barrera, A. G. (2020). Geographical indications for UN sustainable development goals: Intellectual property, sustainable development and M&E systems. *International Journal of Intellectual Property Management*, 10(2), 113-173.

Bava, L., Bacenetti, J., Gislon, G., Pellegrino, L., D'Incecco, P., Sandrucci, A., . . Zucali, M. (2018). Impact assessment of traditional food manufacturing: The case of grana padano cheese. *Science of the Total Environment*, 626, 1200-1209.

Belletti, G., Marescotti, A., & Touzard, J. M. (2017). Geographical indications, public goods, and sustainable development: The roles of actors' strategies and public policies. *World Development*, 98, 45-57.

Belletti, G., Marescotti, A., Sanz-Cañada, J., & Vakoufaris, H. (2015). Linking protection of geographical indications to the environment: Evidence from the european union olive-oil sector. *Land Use Policy*, 48, 94-106.

Bérard, L., & Marchenay, P. (2006). Local products and geographical indications: Taking account of local knowledge and biodiversity. *International Social Science Journal*, 58(187), 109-116.

Bowen, S. (2010). Embedding local places in global spaces: Geographical indications as a territorial development strategy. *Rural Sociology*, 75(2), 209-243.

Chabrol, D., Mariani, M., & Sautier, D. (2017). Establishing geographical indications without state

involvement? Learning from case studies in Central and West Africa. *World Development*, 98, 68-81.

Charrouf, Z., & Guillaume, D. (2018). The argan oil project: going from utopia to reality in20 years. *OCL*, 25(2), D209.

Comissão Europeia. (2020). *Valor económico dos regimes de qualidade da UE, das indicações geográficas e das especialidades tradicionais garantidas*. Disponível em: <https://ec.europa.eu/portugal/news/geographical-indications-european-treasure_pt>.Acesso em maio, 2021.

Dalla Riva, A., Burek, J., Kim, D., Thoma, G., Cassandro, M., & De Marchi, M. (2018). The environmental analysis of asiago PDO cheese: A case study from farm gate-to-plantgate. *Italian Journal of Animal Science*, 17(1), 250-262.

Dede, D., Didaskalou, E., Bersimis, S., & Georgakellos, D. (2020). A statistical frameworkfor assessing environmental performance of quality wine production. *Sustainability (Switzerland)*, 12(24), 1-16.

Egea, P., & Pérez y Pérez, L. (2016). Sustainability and multifunctionality of protected designations of origin of olive oil in Spain. *Land Use Policy*, 58, 264-275.

Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st- century business. *Environmental Quality Management*, 8(1), 37-51.

Falcone, G., Strano, A., Stillitano, T., De Luca, A. I., Iofrida, N., & Gulisano, G. (2015). Integrated sustainability appraisal of wine-growing management systems through LCA and LCC methodologies. *Chemical Engineering Transactions*, 44, 223-228.

Famiglietti, J., Guerci, M., Proserpio, C., Ravaglia, P., & Motta, M. (2019). Development and testing of the product environmental footprint milk tool: A comprehensive LCA tool for dairy products. *Science of the Total Environment*, 648, 1614-1626.

Flinzberger, L., Zinngrebe, Y., & Plieninger, T. (2020). Labelling in mediterranean agroforestry landscapes: A delphi study on relevant sustainability indicators. *Sustainability Science*, 15(5), 1369-1382.

Food and Agricultural Organisation of the United Nations (FAO). (2009–2010). Linking People, Places and Products: A Guide for Promoting Quality Linked to Geographical Origin and Sustainable Geographical Indications, *SINER-GI project*, 2nd ed. [online]. Disponível em: <http://www.fao.org/3/i1760e/i1760e.pdf>. Acesso em abril, 2021.

Gaur, A., & Kumar, M. (2018). A systematic approach to conducting review studies: An assessment of content analysis in 25 years of IB research. *Journal of World Business*, 53(2), 280-289.

Ghosh, P. (2016). Geographical indications: A corner stone in poverty alleviation and empowerment in the Indian Himalayan region. *National Academy Science Letters*, 39(4), 307-309.

González-García, S., Hospido, A., Moreira, M. T., Feijoo, G., & Arroja, L. (2013). Environmental life cycle assessment of a galician cheese: San simon da costa. *Journal of Cleaner Production*, 52, 253-262.

Hoang, G., Le, H. T. T., Nguyen, A. H., & Dao, Q. M. T. (2020). The impact of geographical indications on sustainable rural development: A case study of the Vietnamese Cao Phong orange. *Sustainability*, 12(11), 4711.

Hossain, M. (2018). Frugal innovation: A review and research agenda. *Journal of Cleaner Production*, 182, 926-936.

Instituto Nacional da Propriedade Industrial (INPI). (2021). Guia Básico de Indicação *Geográfica*. Disponível em: <https://www.gov.br/inpi/pt-br/servicos/indicacoes- geograficas/guia-basico>. Acesso em abril, 2021.

Kimura, J., & Rigolot, C. (2021). The potential of geographical indications (gi) to enhance sustainable development goals (sdgs) in japan: Overview and insights from japan gi mishima potato. *Sustainability (Switzerland)*, 13(2), 1-12.

Laurent, C., Hulin, S., Agabriel, C., Chassaing, C., Botreau, R., & Monteils, V. (2017). Co- construction of an assessment method of the environmental sustainability for cattle farms involved in a protected designation of origin (PDO) cheese value chain, cantal PDO. *Ecological Indicators*, 76, 357-365.

León-Bravo, V., Caniato, F., & Caridi, M. (2021). Sustainability assessment in the food supply chain: Study of a certified product in Italy. *Production Planning and Control*, 32(7), 567-584.

Mafra, L. A. S. (2008). Indicação geográfica e construção do mercado: a valorização da origem 20 no Cerrado Mineiro. Tese de Doutorado (Doutorado em Ciências) - Universidade Federal Rural do Rio de Janeiro/RJ.

Menozzi, D. (2014). Extra-virgin olive oil production sustainability in northern Italy: A preliminary study. British Food Journal, 116(12), 1942-1959.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). Qualitative data analysis: A methods sourcebook. Sage publications.

Millet, M., Keast, V., Gonano, S., & Casabianca, F. (2020). Product Qualification as a Means of Identifying Sustainability Pathways for Place-Based Agri-Food Systems: The Case of the GI Corsican Grapefruit (France). Sustainability, 12(17), 7148.

North, D. (1997). Institutions, institutional changes and the functioning of the economy. M.: Nachala.

Nuary, R. B., Sukartiko, A. C., & Machfoedz, M. M. (2019). Towards sustainable Salak Pondoh Sleman (Salacca edulis cv Reinw) farming system: a socio-economic perspective. In IOP Conference Series: Earth and Environmental Science, 355(1), 012030. IOP Publishing.

Organization for an International Geographical Indications Network (OriGIn). (2019). In See the presentation origin the Global Alliance of GIs. Disponível em: <https://www.origin-gi.com/about-us/background.html>. Acesso em maio, 2021.

Pisoni, A., Michelini, L., & Martignoni, G. (2018). Frugal approach to innovation: State of the art and future perspectives. Journal of Cleaner Production, 171, 107-126.

Ramos, C. D. M. (2015). Desenvolvimento territorial sustentável e indicações geográficas: a sustentabilidade ambiental do território dos Vales da Uva Goethe-SC. Disponível em: <https://repositorio.ufsc.br/handle/123456789/169351>. Acesso em abril, 2021.

RIMISP. (2006). Proyecto de desarrollo territorial rural a partir de productos y servicios con identidad: estudo de caso – Brasil. Versión preliminar.

Sachs, I. (2004). Desenvolvimento: includente, sustentável, sustentado. In Desenvolvimento: includente, sustentável, sustentado (pp. 151-151).

Samper, L. F., & Quiñones-Ruiz, X. F. (2017). Towards a balanced sustainability vision for the coffee industry. Resources, 6(2), 17.

Sanz Cañada, J., & Macías Vázquez, A. (2005). Quality certification, institutions and innovation in local agro-food systems: Protected designations of origin of olive oil in spain. Journal of Rural Studies, 21(4), 475-486.

Scott, R. W. (2014). Institutions and Organizations: ideas, interests, and identitites. CA: Sage.

Sinisterra-Solís, N. K., Sanjuán, N., Estruch, V., & Clemente, G. (2020). Assessing the environmental impact of Spanish vineyards in Utiel-Requena PDO: The influence of farm management and on-field emission modelling. Journal of Environmental Management, 262, 110325.V

Strauss, A. L. (1987). Qualitative analysis for social scientists. Cambridge university press.

Suh, J., & MacPherson, A. (2007). The impact of geographical indication on the revitalisation of a regional economy: a case study of 'Boseong'green tea. Area, 39(4), 518-527.

United Nations (UN). (2015). Transforming Our World: The 2030 Agenda for Sustainable Development. Department of Public Information United Nations. Disponível em: <https://search.un.org/results.php?query=transforming%20our%20world&fq=url%3A(www.un.org)&tpl=unn>. Acesso em maio, 2021.

United Nations. (1987). Report of the world commission on environment and development: Our common future. UN Documents. Disponível em: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>. Acesso em maio, 2021.

Vakoufaris, H. (2010). The impact of Ladotyri Mytilinis PDO cheese on the rural development of Lesvos island, Greece. Local Environment, 15(1), 27-41.

Vandecandelaere, E., Teyssier, C., Barjolle, D., Jeanneaux, P., Fournier, S., & Beucherie, O. (2018). Strengthening sustainable food systems through geographical indications: an analysis of economic impacts. European Bank for Reconstruction and Development (EBRD). Disponível em: <http://www.fao.org/3/I8737EN/i8737en.pdf>. Acesso em maio, 2021.

Vecchio, Y., Iddrisu, A. L., Adinolfi, F., & De Rosa, M. (2020). Geographical Indication to Build up Resilient Rural Economies: A Case Study from Ghana. Sustainability, 12(5), 2052.

Wang, J., Xue, Y., Wang, P., Chen, J., & Yao, L. (2021). Participation mode and production efficiency enhancement mechanism of Geographical Indication products in rural areas: A meta-frontier analysis. Physics and Chemistry of the Earth, Parts A/B/C, 121, 102982.