

La administración de la cadena de suministro sustentable y las pequeñas y medianas empresas de economías emergentes: caso México

The Sustainable Supply Chain Management and the Small and medium-sized enterprises of emerging economies: The case of Mexico

A administração da cadeia de suprimentos sustentável e as pequenas e médias empresas de economias emergentes: caso do México

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Resumen

La administración de la cadena de suministro sustentable (*sustainable supply chain management* o SSCM por sus siglas en inglés) es un tema de investigación que ha cobrado mayor interés en los últimos años; sin embargo, todavía faltan estudios que se enfoquen en la SSCM y en las pequeñas y medianas empresas (pymes) con inversión nacional, principalmente en economías emergentes como la mexicana. Por esta razón, el objetivo de este trabajo fue realizar una revisión literaria para conocer y comprender la situación en la que se encuentran la SSCM y las pymes mexicanas con inversión nacional. El método de investigación para lograr la revisión y alcanzar el objetivo fue por medio de un análisis de contenido. En síntesis, los resultados demuestran que aún existen varios vacíos teóricos a nivel estratégico, táctico y operacional, por lo cual no es posible generalizar modelos conceptuales y matemáticos, ni tampoco es posible generalizar dicha teoría entre economías emergentes y desarrolladas. En consecuencia, se deben concretar más investigaciones centradas en determinados sectores mexicanos en los que también se puedan considerar diversas metodologías para tener una perspectiva más profunda. Aun así, se puede asegurar que la



incentivación de la SSCM en las pymes mexicanas puede generar beneficios económicos, sociales y ambientales para los miembros de la cadena de suministro, dependiendo del sector y del caso de estudio.

Palabras clave: administración de la cadena de suministro sustentable (SSCM), pequeñas y medianas empresas (pymes), revisión de literatura, sustentabilidad.

Abstract

The Sustainable Supply Chain Management (SSCM) is a research topic that has taken more interest in recent years; however, there is still a lack of studies focusing on SSCM and Small and Medium Enterprises (SMEs) with national investment, mainly in emerging economies such as Mexico. That is why, the objective was to carry out a literature review to know and understand the Mexican situation according to the SSCM and the SMEs with national investment. The research method to achieve the review and the objective was through a content analysis. In summary, the results show that there are still several theoretical gaps at a strategic, tactical and operational level, therefore, it is not possible to generalize conceptual and mathematical models, nor is it possible to generalize this theory between emerging and developed economies. Consequently, it is necessary to develop more research focused on certain Mexican sectors with different methodologies to have a deeper perspective. However, it is pointed out that incentivizing the SSCM in Mexican SMEs may generate economic, social and environmental benefits for members of the supply chain, depending on the sector and the case study.

Keywords: Sustainable Supply Chain Management (SSCM), Small and Medium Enterprises (SMEs), Literature Review, Sustainability.

Resumo

A administração da cadeia de abastecimento sustentável (SSCM por sua sigla em inglês) é um tema de pesquisa que ganhou mais interesse nos últimos anos; No entanto, ainda faltam estudos focados em SSCM e pequenas e médias empresas (PMEs) com investimento nacional, principalmente em economias emergentes como o México. Por esta razão, o objetivo deste trabalho foi realizar uma revisão literária para conhecer e compreender a situação em que as PMEs do MSC e do México são encontradas com investimento nacional. O método de pesquisa para alcançar a revisão e atingir o objetivo foi através de uma análise de conteúdo. Em suma, os resultados mostram que ainda existem várias lacunas teóricas em nível estratégico, tático e operacional, para as quais não é possível generalizar modelos conceituais e matemáticos, nem é possível generalizar essa teoria entre economias emergentes e desenvolvidas. Consequentemente, mais pesquisas focadas em determinados setores mexicanos devem ser especificadas, nas quais diferentes metodologias podem também ser consideradas como tendo uma perspectiva mais profunda. Mesmo assim, pode-se assegurar que o incentivo do SSCM nas PMEs mexicanas possa gerar benefícios econômicos, sociais e ambientais para os membros da cadeia de suprimento, dependendo do setor e do estudo de caso.

Palavras-chave: gestão sustentável da cadeia de suprimentos (SSCM), pequenas e médias empresas (SMEs), revisão de literatura, sustentabilidade.

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Introduction

The available literature suggests that more research is needed related to the administration of the sustainable supply chain (SSCM), especially regarding environmental and even more social aspects (Carter and Rogers). , 2008; Seuring, 2011). The SSCM is based on long-term partnerships (Seuring and Müller, 2008), which is often difficult to achieve (Chkanikova, 2012), it is expensive and there is no clarity on how to implement it (Wolf, 2011), also lacking good metrics. established (Ahi and Searcy, 2014).



In addition to this, and in contrast to what happens in developed countries, in emerging economies there are fewer studies on environmental and sustainable issues that include SMEs and SSCM (Ehrgott, Reimann and Carter, 2011; Zhu, Sarkis, Lai and Geng, 2008). Some reasons that probably cause a lower implementation of the SSCM are the lack of resources, as well as the lack of external pressures to which these companies are subjected (Zhu et al., 2008). Also, there are different standards and a limited administrative capacity of the suppliers from these countries (Sautter, 2002, cited by Koplín and Schneidewind, 2003).

Their limited resources do not allow SMEs to access new technologies or innovations to address new opportunities (Hillary, 2000), however, these restrictions must be addressed to achieve competitive advantages supported by the principles of sustainability (Young and Young, 2001, cited by Bispo, Roldan and Hansen, 2011), because according to the European Commission (EC, 2005) this type of companies tend to generate a large amount of pollutants.

In fact, the Organization for Economic Cooperation and Development (Organization for Economic Co-operation and Development or OECD for its acronym in English), SMEs included in this organization constitute between 96% and 99% of all registered companies, of there they offer a large number of jobs (OECD, 2002). Meanwhile, in the case of the emerging Mexican economy¹, SMEs not only make up 99.7% of the total number of companies in the country, but also generate 42% of GDP, as well as 64% of general employment (OECD, 2002).

All this should be an indisputable argument so that in our country more research and proposals that link SMEs with the SSCM could be concluded. However, reality shows that it is usually focused on large companies, which act as a focal company, that is, they lead their supply chains, without identifying if they have international or national investments and if their members are SMEs.

For these reasons, the objective of the present investigation is to carry out a literary review to know the situation of the SSCM and Mexican SMEs with national investment through a content analysis. For this, the following questions have been proposed:

¹ De acuerdo con las clasificaciones realizadas por Morgan Stanley Capital International (MSCI, 2018) y FTSE Russell (FTSE, 2018), se puede señalar que México es una economía emergente.



- What is the Mexican situation regarding SSCM and SMEs with national investment?
- What are the findings and opportunities for SMEs with national investment to incentivize SSCM in emerging economies such as Mexico?

Likewise, and considering that this research is of a qualitative nature, the following hypothesis has been used: the research and the incentive of the SSCM and the Mexican SMEs are in an initial state.

Theoretical framework

Sustainable development and supply chain management (SCM)

Sustainable development (SD) is a concept that underlies an environmental, social and economic dimension (Carter and Rogers, 2008), so it can be defined as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs "(World Commission on Environment and Development [WCED], 1987, p.54). This purpose, however, lacks results that explain how sustainable strategies can be introduced in regular practice or how they can be used to improve competitiveness (Baldwin et al., 2005, cited by Walke, Topkar and Kabiraj, 2010).

On the other hand, the administration of the supply chain (supply chain management or SCM by its initials in English) is conceived of the following way:

The management of a network of relationships within a company, and between interdependent organizations and business units consisting of suppliers of materials, purchases, production facilities, logistics, marketing, and related systems that facilitate the forward and backward flow of materials, services, finances and information from the initial producer to the end customer with the benefits of adding value, maximizing profitability through efficiency and achieving customer satisfaction (Stock y Boyer, 2009, p. 706).



This term, however, still requires guidance on how the stakeholders can apply their basic concepts, so it is necessary to have a deep understanding of how companies interact with each other to achieve the implementation of SCM (Seuring , 2004). The SCM has for years been a key function of the companies, since more than half of the creation of value is carried out by the suppliers (Koplin and Schneidewind, 2003). That is why, members of the supply chain share productivity, reliability, as well as environmental and social problems, so that they increasingly depend on each other (Kaluza and Tretz, 1997, cited by Koplin and Schneidewind, 2003).

Small and medium enterprises (SMEs)

It is complex to define the concept of SMEs (small and medium enterprises), since there is no international consensus on their nature or on their characteristics (Henríquez, 2009), which is why their main classification is based on employment, sales and the volume of business they generate, as well as in the economic sector to which they belong (González, 2005), which in short is also often questionable. Therefore, it is common for SMEs to be considered as such by their number of employees.

In this sense, and taking as reference the Classification of the European Union (EC) (2005) and the Official Gazette of the Mexican Federation (DOF, 2009), in a microenterprise would work less than 10 employees, in a small company less than 50 workers, and in the medium company less than 250 employees. In this classification, in addition, SMEs that are part of large companies with high capital, which are known as franchises are discarded (Henríquez, 2009). Due to the above, in the present investigation, SMEs are considered to be those that have less than 250 employees.

The management of the sustainable supply chain (SSCM)

According to several researchers, there are few studies that offer reflections and solid theory on SSCM, so that case studies and surveys represent opportunities to contribute knowledge to this theory (Chkanikova, 2012, Gold, Seuring and Beske, 2010). In the SSCM it should be taken into account that the SCM is combined and complemented with sustainable development. For this reason, Carter and Rogers (2008) point out that in the SSCM there is a close link between the SCM and a triple balance (known in English as triple bottom line) determined by environmental, social



and economic aspects, which together form the development sustainable, for which said authors define the SSCM in this way:

The transparent, strategic integration and achievement of social, environmental and economic goals of an organization in systemic coordination of key business processes between organizations to improve the long-term economic performance of the company individually, as well as its supply chains (p. 368).

An important aspect of the SSCM is the long-term associations (Seuring and Müller, 2008), which are difficult to achieve, since the maintenance and integration of an association are often expensive and risky (Bensaou, 1999, quoted by Chkanikova, 2012), needing in some cases a high investment of human resources, time and technology, which could nevertheless be rewarded by the benefits of the SSCM (Wolf, 2011), which are linked to a competitive advantage for the members of the supply chains (Gold, Seuring and Beske, 2010). This means that in order to replace SCM with SSCM, companies must have both conventional SCM performance criteria and the SSCM's sustainable performance criteria (Halldórsson et al., 2009, cited by Seuring, 2011).

The management of the sustainable supply chain (SSCM) and the SMEs of emerging economies

A study on emerging economies (Zhu et al., 2008) showed that medium and large companies in general pay more attention to environmental problems and the management of the green supply chain (GSCM).) that small businesses, which often depend on large companies to implement them. This dependence exists because in most cases the focal company has more power than the provider. However, to achieve innovation in SSCM, companies must have an interdependence of power with common interests (Cox, 2001, cited by Chkanikova, 2012).

Likewise, it is worth noting that the main reasons that have led companies to implement the SSCM have been the legal norms or sanctions imposed against them (Koplin and Schneidewind, 2003). However, in an emerging country such as China, for example, regulatory pressures from governments have not fostered the sustainable behavior of suppliers (Ehrgott et al., 2011), in other cases companies have found motivation to implement this practice because to which they have perceived the opportunity to obtain a competitive advantage (Gold, Seuring and Beske, 2010), which could be obtained through the reduction of costs, sense of responsibility, desire to satisfy customers and count on their loyalty (Teuteberg and Wittstruck, 2010).



In this way, the focal companies have had more impact on the sustainable behavior of the suppliers when they have devoted considerable efforts to develop collaborative relationships with their suppliers (Charter et al., 2001, cited by Chkanikova, 2012). Thus, purchasing strategies can impact and promote environmental and social practices in SMEs through the supply chain (Wolf 2011), although it should be noted that it is more complicated to practice purchasing strategies with suppliers from emerging economies. This is due to the fact that, most of the time, in those countries organizations lack the drivers, financial opportunities and information to improve their sustainable performance. (Chkanikova, 2012).

On the other hand, and in relation to the preferences of the clients, Seuring (2011) indicates that these could move towards green or sustainable products only if they meet their needs. Therefore, customers must be integrated into the supply chain activities of each industrial sector, since they play a central role in the future, allowing companies their existence and long-term growth (Koplin, Behrens, Seuring and Schneidewind, 2002).

Likewise, it should be foreseen that the level of interest in the practices of the SSCM in the companies depends on what is produced (Bispo et al., 2011), although it is also worth mentioning that marketing strategies can be manipulated through influence demand patterns (Koplin et al., 2002).

In summary, and although the literature on SSCM is still limited, 90% of politicians, economists and the media believe that companies that practice sustainability are more successful in the long term (Kothes, 2001, cited by Koplin and Schneidewind, 2003). Therefore, companies must be able to solve problems with their supply chain partners in order to achieve competitive advantages (Young and Young, 2001, cited by Bispo et al., 2011), since it has been demonstrated that manufacturing companies in developed countries have obtained benefits through environmental management systems (Tan, 2005, citado por Walke *et al.*, 2010).

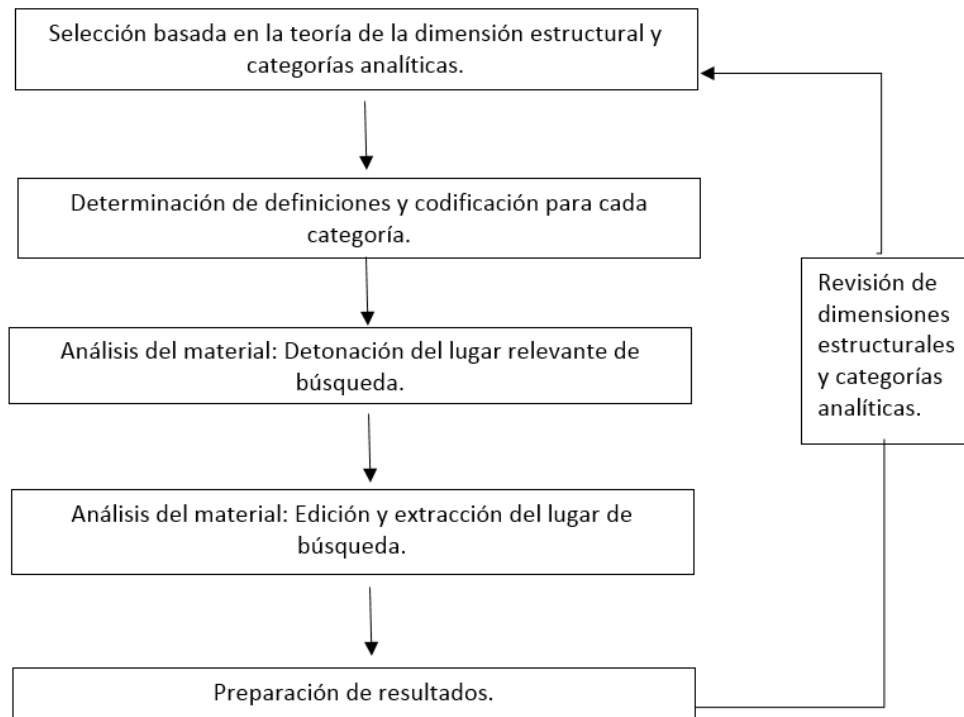


Methodology

Due to the early theoretical stage of SSCM and SMEs, researchers have been including a variety of research methods, which in some cases may not seem as feasible, basically, as Seuring (2011) points out, none can be seen as superior to another, but as complementary. With this observation, the present investigation was developed based on the content analysis, which "implies the development of a representation of relationships between the elements in the objective material. To do this, the qualitative and quantitative aspects of the data must be considered "(Brewerton and Milward, 2001, cited by Kotzab, Seuring, Müller and Reiner, 2005 p.100). In this sense, we followed a process model published by Mayring (2000), which is based on the following steps, based on Figure 1:

1. Collection of material: It is the material that is used during the collection, which defines and delimits the unit of analysis.
2. Descriptive analysis: The analysis is based on criteria established from the objective. Therefore, some formal aspects of the material are evaluated.
3. Category selection: Structural dimensions and related analytical categories are selected that are applied in the literature review to structure the field.
4. Evaluation of material: The content of the documents is analyzed according to the structural dimensions and categories.

Figura 1. Proceso de investigación para la estructuración del análisis de contenido



Fuente: Mayring, 2002, citado por Kotzab *et al.* (2005, p. 95)

Collection of material

This content analysis was delimited as follows:

1. Publications were included in English and Spanish, so other languages were discarded.
2. The search for publications was done in different journals and databases, taking into account works published since 1987 (year in which WCED defined the concept of sustainable development) until 2014.
3. The search was carried out mainly by particular combinations of keywords, such as a) administration of the sustainable supply chain and SMEs in Mexico; b) administration of the supply chain, small and medium-sized companies in Mexico; c) sustainable, sustainability and small and medium enterprises in Mexico; d) small and medium-sized companies in Mexico, administration of the supply chain and the environment; e) Small and medium-sized companies in Mexico, supply chain management and the social term. The search did not include keywords such as reverse logistics, remanufacturing and administration of the green supply chain.

4. For the search, databases or library services were used, such as Scimedirect, Ebsco and Proquest, as well as the International Congresses of Logistics and Supply Chain (Cilog) in Mexico.

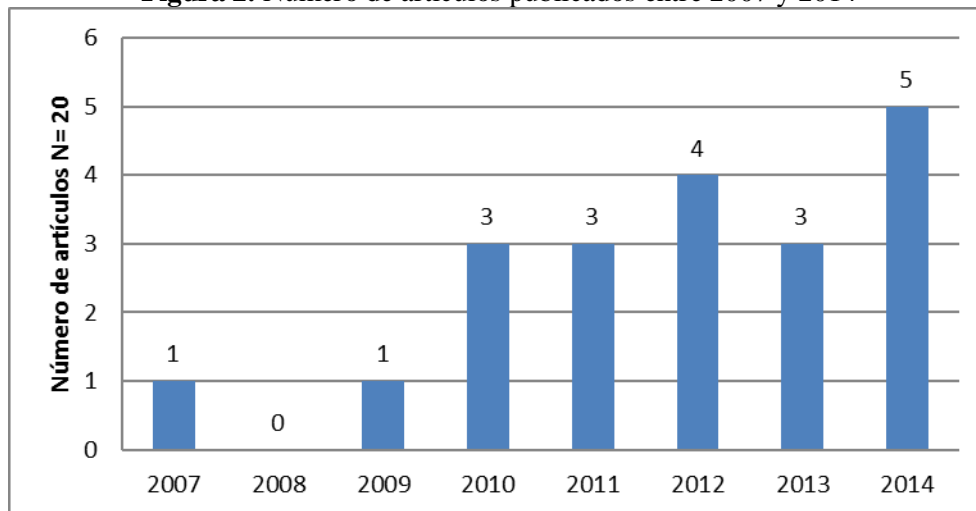
Descriptive analysis

The analysis was made based on the following criteria:

1. What is the distribution of publications from 1987 to 2014?
2. In what dimension are the articles published according to the present content analysis?
3. What is the situation in Mexico regarding SSCM and SMEs with national investment?
4. What are the opportunities and findings to encourage SSCM in emerging countries such as Mexico?

Although the period taken was from 1987, only 20 articles were found between 2007 and 2014 (Figure 2). This means that research on these issues is almost nil, so it can be said that there is still an unexplored field to develop this type of work.

Figura 2. Número de artículos publicados entre 2007 y 2014

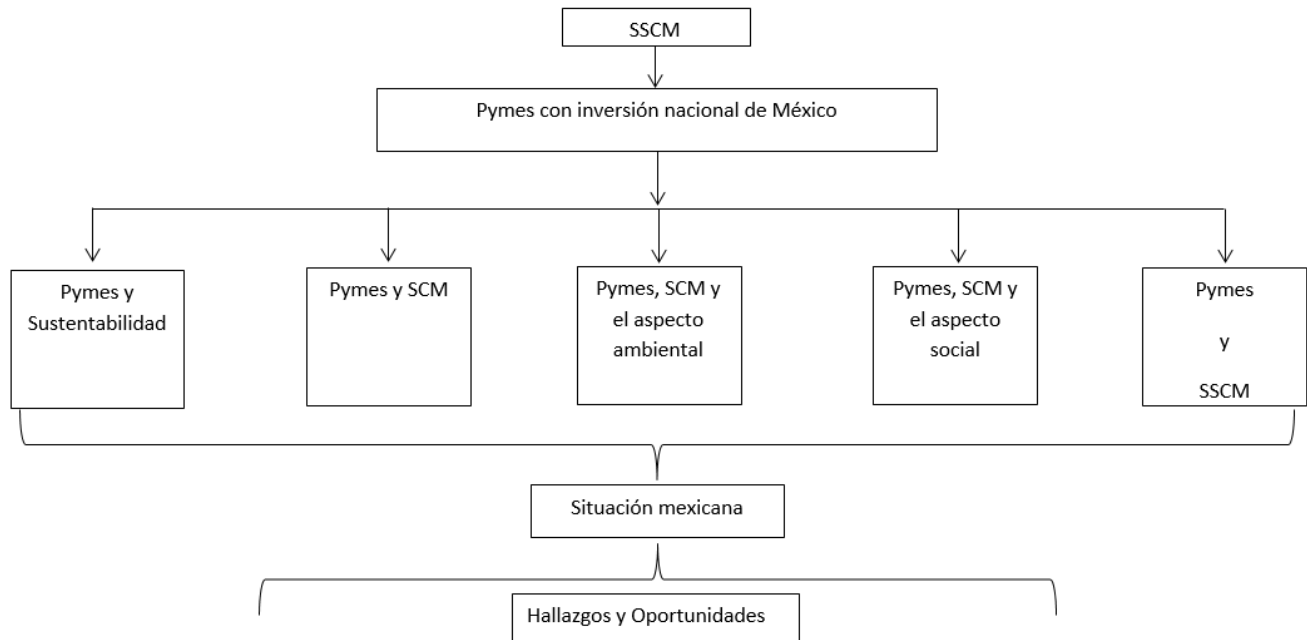


Fuente: Elaboración propia

Category selection

This section shows the dimensions developed in the literature review (figure 3). The articles are divided into five dimensions according to the SSCM and SMEs with national investment; In this way we can appreciate the Mexican situation, as well as the findings and opportunities.

Figura 3. Selección de categoría para la revisión de literatura



Fuente: Elaboración propia

In the first dimension, SMEs and sustainability are considered. In the second, there are SMEs and SCM. In the third, SMEs, the SCM and the environmental aspect. The fourth dimension is made up of SMEs, SCM and the social aspect. And finally, there are the SMEs and the SSCM. The number of articles found according to the previous dimensions is shown in table 1:

Tabla 1. Numero de artículos encontrados por dimensiones

Dimensiones	N.º de artículos	Porcentaje
Pymes y sustentabilidad	9	45 %
Pymes y SCM	5	25 %
Pymes, SCM y aspecto ambiental	0	0 %
Pymes, SCM y aspecto social	1	5 %
Pymes y SSCM	5	25 %
Total de artículos	20	100 %

Fuente: Elaboración propia

As can be seen, Table 1 shows a greater amount of research on SMEs and sustainability (45%), while in the other dimensions there is a greater shortage of jobs.

Results

In this section we present step 4, that is, the evaluation of the material for this literature review, for which the categorical selection was taken as reference (step 3). The analysis was based on table 2, in which the authors, the objectives, the category and the year of the publications are shown.

Tabla 2. Clasificación de artículos analizados

Autor	Objetivo principal del artículo	Dimensiones				
		1	2	3	4	5
Rosas-Baños y Lara-Rodríguez, (2013)	El objetivo de este trabajo es analizar el caso de San Pedro El Alto de México, con la perspectiva de desarrollo endógeno local. El análisis es desarrollado de acuerdo con la propuesta de Víctor Toledo (1996) sobre comunidades sostenibles, es complementado con otras investigaciones que presentan la transición de la producción de subsistencia a una producción que aumenta la calidad de vida (Barkin y Rosas, 1996; Rosas, 2011).	X				
Michelena y Espinosa (2007)	El objetivo general de este trabajo es desarrollar y aplicar un modelo de gestión para la operación sostenible y gestión de la calidad en las fábricas de café para que puedan operar de manera eficiente y eficaz.	X				
Mun y Seo (2012)	Este estudio analiza las implicaciones que puede tener el comercio justo para los agricultores mexicanos de pequeña escala. El comercio justo trata de cubrir el costo de producción y las necesidades básicas de los pequeños agricultores, así como la creación de vínculos directos entre productores y consumidores.	X				
Velázquez-Sánchez, Gómez-Velázquez, Gaytán, Flamenco y Núñez (2014)	En esta investigación se examinaron las dimensiones del desarrollo sustentable en servicios ecoturísticos y actividades de 35 comunidades indígenas de México. Este estudio propone una metodología alternativa para el análisis del ecoturismo y el desarrollo sustentable.	X				
García, Portales, Camacho y Arandia (2010).	El propósito de este trabajo es analizar la metodología y los instrumentos utilizados para evaluar la sustentabilidad y la responsabilidad social en las organizaciones con el fin de proponer una encuesta para evaluar la sustentabilidad del negocio de pequeñas y medianas empresas en México debido a que menos de la mitad sobreviven los primeros diez años de funcionamiento.	X				
Kú, Pool, Mendoza y Aguirre (2012).	El objetivo principal es proponer una metodología para evaluar la viabilidad del subsidio económico en los sistemas de producción a través de indicadores locales de sustentabilidad en la Región Constitución, Calakmul, Campeche (México).	X				
Vidaurri y Morgan (2011)	El objetivo es estudiar cómo la autoridad norma y cómo la actividad empresarial desempeña la gestión sustentable en residuos sólidos y líquidos, emisiones y consumo de energía, específicamente en la industria de la curtiduría.	X				
Portales, García, Camacho y Arandia (2009)	Se tiene como objetivo presentar un modelo de negocio sustentable, que surge de la necesidad percibida de generar modelos que favorecen la supervivencia de las pequeñas y medianas empresas en un contexto en el que aproximadamente 65 % mueren durante sus dos primeros años de funcionamiento.	X				
Magallón y Montoya (2011)	El objetivo es comprender por qué las pequeñas organizaciones familiares son importantes y las circunstancias que inducen a las redes de cooperación, los factores que determinan que se faciliten o impidan su estancia de institucionalización en contextos como la Sierra Nevada, una región estratégica para el desarrollo, inmersa en procesos continuos de cambios sociales, políticos y económicos.	X				
Van Hoof y Lyon (2012)	Esta investigación evalúa los beneficios y costos de los proyectos de producción más limpia, formulada por pequeñas y medianas empresas (pymes) que participan en un programa de proveeduría sustentable en México.					X

Van Hoof y Thiel (2013).	Esta investigación puso a prueba un modelo teórico de la capacidad de colaboración como un constructo de organización multidimensional para medir la implementación de la producción limpia dentro de las cadenas de suministro.						X
Van Hoof (2013)	Se midió el aprendizaje organizacional en producción más limpia mediante el acceso diferencial de desempeño entre los proveedores en la implementación de proyectos de producción más limpia.						X
Van Hoof y Thiel (2014)	Este estudio analiza las relaciones de los estímulos de las empresas focales para contribuir a la difusión de producción más limpia y su contribución real, siguiendo un enfoque de respuesta estimulante.						X
Cano, Orue, Martínez, Mayett y López (2014)	Esta investigación tiene como objetivo el diseño de un modelo conceptual de gestión logística en pymes implicadas en el sector textil. Este modelo detecta las variables que tienen el mayor impacto en los procesos de logística por medio de un análisis factorial exploratorio.		X				
López, Martínez, Cavazos y Mayett (2012)	Esta investigación tiene dos objetivos principales: 1) obtener la situación del proceso global de mezcal y 2) desarrollar un modelo de planificación táctica de la cadena de suministro de mezcal.		X				
Morales, Luna y Ayala (2010)	El objetivo es identificar las características de acuerdo con un análisis exploratorio descriptivo entre clientes y proveedores de la cadena de suministro de cuero-calzado (vendedores y fabricantes de calzado).		X				
Villarreal y Soria (2010)	El objetivo general es analizar el efecto de la implementación de la logística integral para lograr la competitividad y la creación de valor en las pequeñas y medianas empresas del sector del calzado en la ciudad de León, Guanajuato.		X				
Camargo (2011)	El propósito de este trabajo fue explorar los factores de desempeño en las empresas integradoras mexicanas (una forma de alianza estratégica), mediante la aplicación de un modelo teórico integral derivado de una revisión exhaustiva de la literatura publicada desde 1985 hasta 2010.		X				
Acevedo, Lobato, Ruiz y Heras (2014)	El objetivo de este trabajo es proponer un marco para el análisis y toma de decisiones en las cadenas de suministro sociales, tomando el programa Liconsal del gobierno mexicano que distribuye leche a precios subsidiados.					X	
Reyes y Bernabé (2014)	Se presenta un modelo para su aplicación en los sistemas de medición del desempeño logístico de proveedorías nivel 1, no transnacionales y con pequeñas y medianas empresas. Este modelo sugiere la aplicación de métricas de logística por etapas, evolutivamente, pasando de un estado a otro gradualmente, moviendo la conducta, el propósito y la actitud hacia la aplicación de métricas.						X
Total de artículos		9	5	0	1	5	
<p>Dimensiones: 1: Pymes y sustentabilidad; 2: Pymes y SCM (administración de la cadena de suministro, <i>supply chain management</i> o SCM por sus siglas en inglés); 3: Pymes, SCM y aspecto ambiental; 4: Pymes, SCM y aspecto social; 5: Pymes y SSCM (administración de la cadena de suministro sustentable, <i>sustainable supply chain management</i> o SSCM por sus siglas en inglés).</p>							

Fuente: Elaboración propia

As seen in table 2, there is not a lot of research in Mexico. In fact, the main authors who have worked on issues related to SMEs and the SSCM are Van Hoof, Thomas P. Lyon and Marcus Thiel. The results of each proposed dimension are explained in detail in the following subsections.



SMEs and sustainability

The investigations found in this section have been developed mainly with the purpose of having a direct impact in some regions of the country. To a large extent, publications based on qualitative studies were found, so it can be said that quantitative works are scarce.

In particular, there were projects that tried to include and help the local population in competitive businesses with environmental and social aspects of sustainability (Rosas-Baños and Lara-Rodríguez, 2013, Toledo and Ortiz-Espejel, 2014). Likewise, successful projects were found that sought to achieve the three aspects of sustainability, involving SMEs and local communities. An example of this was an ecotourism work that showed a positive relationship between the three dimensions of sustainable development in indigenous communities in Mexico (Velázquez-Sánchez et al., 2014).

Another evidence is small Mexican farmers from indigenous communities where they tried to connect producers directly with customers to achieve fair trade in coffee production. However, it was evident that this type of relationship does not offer the solution to all the problems of small farmers (Mun and Seo, 2012). Even so, it can be indicated that cooperatives and associations are trying to work in a network, based on small organizations with the goal of providing jobs and self-employment, and helping the regional economy through small groups of autonomous companies.

The network of eco-farmers is a clear example of this, formed by ten small organizations that produce and sell organic foods in a regional market (Magallón and Montoya, 2011). These initiatives open a path for entrepreneurs who wish to develop sustainable SMEs with the participation of their families through local networks, although it should be anticipated that in family businesses the owner plays an important role, since it can lead to success or failure, which would therefore also affect the entire network.

On the other hand, a study was found in the Mexican tannery industry, mostly made up of SMEs, in which a qualitative evaluation is carried out on sustainable aspects, finding a low sustainable yield, and showing the government at its three levels (local, state and national) as a key element to improve the harmful effects of the industry (Vidaurrí and Morgan, 2011).



Likewise, it should be noted that the majority of Mexican research has focused on sustainable models and evaluations for SMEs. Michelena and Espinosa (2007), for example, developed a model for coffee agroindustry in order to work with sustainable operations, production optimization, quality management and added value. This proposal was not applied, although it provided support for strategic planning.

On the other hand, the results reported by Kú et al. (2012) showed that the production systems of chile and corn have different levels of integration, even when both projects were from the same region. Specifically, these authors developed a methodological proposal to evaluate productive projects through sustainable local criteria.

Finally, a theoretical model of sustainable business was found, composed of five dimensions that assess the sustainability of SMEs in order to achieve competitiveness (García et al., 2010; Portales et al., 2009).

SMEs and SCM

This section shows more advanced research on SMEs and SCM than on SMEs and SSCM. Mexican studies on SMEs and SCM have been found mainly in the textile, mezcal, leather-footwear industries, among others. Also, and according to various inquiries, it can be noted that there is a lack of integration in the supply chain with the SCM and Mexican SMEs, as is the case with the mezcal industry. Therefore, if there is an improvement in logistics and commercialization between the primary and secondary sectors of said industry, it could have a better integration and benefits throughout the supply chain (López et al., 2012).

On the other hand, Cano et al. (2014) have designed a conceptual logistic model based on SMEs in the textile sector. This was based on the exploratory factor analysis, resulting in three main factors: the administration of distribution and supply, the administration of demand and the administration of production. In this work, it was perceived that SMEs needed greater efforts in strategic areas such as coordination to establish and define production systems that can more effectively integrate SMEs into supply chains.

Likewise, Morales et al. (2010) described some integration problems in the leather-footwear supply chain related to the lack of a formal contract along the supply chain, which occurs in 74% of the cases; as well as the absence of a common policy on inventory management (88%) and the lack of technical assistance to suppliers (62%).

On the other hand, Villarreal and Soria (2010) reported that the footwear sector, which is mainly made up of family SMEs, has organizational and administrative deficiencies due to the fact that most of its owners only have empirical knowledge, being the directors and managers an important piece to develop the footwear supply chain. Added to this, the mentioned authors indicated the lack of deliveries of the suppliers.

In the context of SMEs with national investment, in short, the integration of the supply chain must be improved in order to boost competitiveness and innovation. Even so, it must be foreseen that it is difficult to build a general model to achieve this objective, since there are determining factors in each sector (Camargo, 2011).

SMEs, the SCM and the social aspect

In this dimension we found only one research on the SCM and the social aspect. The objective was to propose a framework for analysis and decision making in social supply chains, considering distribution in an efficient, equitable and regulated manner. Specifically, this research focused on the Liconsa program of the Mexican government, which distributes subsidized milk, although the price at the national level is higher than that referenced abroad, the government prefers to make national purchases. This is to contribute economically to the sector and also distribute it to the population that is in a situation of poverty (Acevedo et al., 2014).

SMEs and the SSCM

On this subject, it can be indicated that there are few researches in which the authors explain if the SMEs are focal companies and if they have national or international investments. In fact, in the review conducted it was found that there are SMEs functioning as focal companies that are leading or trying to lead supply chains.



Other researchers (Van Hoof and Thiell, 2014), meanwhile, have focused on aspects of clean production (clean production or CP for its acronym in English) and the SSCM in Mexico, involving SMEs with national and international investment. This work has been developed in cooperation with the Sustainable Supply Chain Program of Mexico, which grouped a variety of companies of different sizes and sectors. The focal companies were usually large transnational companies, while the rest of the companies were regularly suppliers classified as SMEs. The companies that participated in this program did so because they wanted to obtain better performance of suppliers, leadership in sustainability, reputation of socially responsible business (CSR), and also wanted to improve their collaboration with the Commission of Environmental Cooperation of North America (Commission of Environmental Cooperation in North America or CEC) and with environmental authorities (Van Hoof and Thiell, 2014).

The capacity of collaboration in Mexican companies is dictated by the type of companies and managers. Companies are influenced to a greater extent by the sector to which they belong, while managers influence companies in the collaborative aspect according to their educational profiles (Van Hoof and Thiell, 2013). For this reason, it is essential that the focal companies select the appropriate managers to impact the members of the supply chain, so that they can generate sustainable supply chains (Van Hoof y Thiell, 2013).

The CP, in fact, is an element that contributes to the SSCM (Van Hoof, 2013). In this regard, Van Hoof and Lyon (2012) confirm that some applications of the PC in Mexico have a net present value higher than innovation and best practices, although the benefits depend on the size of the company. In addition, Van Hoof (2013) points out that organizational learning is a vital element for the implementation of the PC. This means that Mexican companies -depending on the supply sector, the size of the company, the type of supplier and the characteristics of the managers- can obtain more or less CP organizational learning levels both internally and among the members of the chain of supply.

Seuring and Müller (2008) point out that focal companies play a crucial role in sustainable supply chains, as they drive and govern the supply chain. In Mexico, Van Hoof and Thiell (2014) found that Mexican focal companies are key links both to integrate supply chains and to persuade their members towards sustainability and CP.

The measurement of sustainability is important to evaluate and to explore the potentialities of the supply chain when companies wish to implement SSCM. Consistent with this idea, Reyes and Bernabé (2014) develop a theoretical measurement instrument for Mexican SMEs related to the SSCM. Its proposed model implies logistic metrics that can be applied sequentially, passing from one state to another gradually. This model focuses on non-transnational suppliers that seek to evolve and measure their internal and external logistics performance in order to achieve sustainable supply chains.

However, according to Koplín et al. (2002), it is more difficult for SMEs than for large companies to meet the requirements of a sustainable evaluation. Although the latter is not a general rule, since to measure the performance of the SSCM, the particular circumstances of each supply chain have to be assessed (Ahi and Searcy, 2014), for which all internal and external factors must be considered. external, which will vary over time. Finally, it should also be noted that in emerging countries SSCM practices do not necessarily represent an improvement in cost performance or short-term profitability (Esfahbodi, Zhang and Watson, 2016).

The Mexican situation on SSCM and SMEs

Research on the Mexican situation in SSCM and SMEs with national investment is in an initial state, although there are more and more advances. In fact, two main types of situations were identified in the country: one in the primary sector and another in the secondary, which were divided in that way according to their similarities and characteristics through content analysis.

In the first one, the manufacturing SSCM was located, constituted by the SMEs of that sector; while in the second, the food and agriculture SSCM was grouped, basically formed by organizations, associations and SMEs in the primary sector. The results of both situations are explained in more detail in the following sections.

The Mexican situation on manufacturing SSCM and SMEs

The manufacturing SSCM is formed by family SMEs of that sector. These supply chains have infrastructure, markets and have survived for many years, although they have problems competing in the global market, especially with Asian companies.

Some findings were the difficulties that family SMEs have to integrate and direct the supply chain from the role of a focal company. Although they have infrastructure and a market, their supply



chains are not working productively, effectively and efficiently. However, there is a high possibility of improvement, as in the footwear sector, in which a cluster could even be potentialized (Hernández and Morales, 2012), but first they must seek alternative solutions to their problems, among which they highlight certain deficiencies in distribution, marketing, demand management and production, organization and logistics.

These companies, therefore, must work with greater impetus in the formalization of the supply chain, as well as in the "paradigm of collaboration", which is part of the integration of the SSCM. The improvement in this manufacturing sector through the SSCM could help to maintain jobs and to collaborate in economic growth in a sustainable manner, since currently there are problems to compete and achieve sustainability, as is the case with the footwear and textile industry.

The Mexican situation on the agro-food SSCM and SMEs

The initiatives to develop sustainable agri-food supply chains are promoted in particular by family SMEs in the primary sector. In Mexico, efforts have been made to involve the sector more in sustainable research and projects, including not only companies, but also the communities where SMEs are located, although in many cases the limitations to compete with the majority of family SMEs from different sectors.

Therefore, and to achieve the agro-food SSCM, some key elements are important, such as formalization, collaboration and operations management. In this sense, the SSCM is more likely to be reached if the administrators of SMEs have an adequate educational profile that helps promote sustainable initiatives. Likewise, if SMEs work with sustainable supply chains, they could face global competition and generate new ones.



Discussion

The results of this work demonstrate an initial state of research and encouragement of SSCM and SMEs with national investment in Mexico. Consistent with this statement, Wolf (2011) points out that the SSCM theory is limited regarding how to internally and externally integrate sustainability. In the country, it is observed that the main challenge for SMEs is the horizontal and vertical integration of the SSCM so that they can compete in the global market.

Likewise, it can be noted that some classic problems related to this issue have to do with financial elements, formalization, administrative capacity and innovative technology, since these do not allow SMEs to compete efficiently. In this scenario, some SMEs in the manufacturing sector come to react corrective only to stay afloat in the global market, but without evolving rapidly in environmental and social issues.

In this review, on the other hand, it was found that some SMEs are trying to play the role of a focal company, as they try to lead their supply chains without belonging to a supply chain of a large company. Unfortunately, it is difficult for SMEs to incentivize the SSCM to be focal companies, since they first need to overcome some classic obstacles faced by this type of companies (EC, 2005) and then have to assume an interdependence of power with the companies or organizations involved in its chain of supply (Cox, 2001, cited by Chkanikova, 2012).

Likewise, it is possible to point out that the implementation of SSCM has happened, in most cases and in a general way, due to government pressures (Koplin and Schneidewind, 2003). In the case of Mexico, however, there is no documentary evidence to support this idea, although it can be mentioned that the government used a program to promote and promote sustainability in supply chains (Van Hoof and Thiell, 2014).

Finally, a study on emerging economies showed that medium and large companies generally pay more attention to environmental problems than small businesses (Zhu et al., 2008), which is also evident in the footwear sector of our country. , since a large part of these SMEs are not interested in this type of situation. However, it is also worth noting that large companies are more interested in sustainability when they take on the role of a focal company, although this depends on the sector (Van Hoof and Thiell, 2014). In addition, it should be noted that some useful tools for large companies may not be feasible for small businesses (Chen and Hambrick, 1995, cited by Zhu et al., 2008). Therefore, the situation of the manufacturing SSCM and the agro-food SSCM have their



main challenge and opportunity in the formalization and integration of the supply chain to try to achieve the SSCM.

Conclusions

In this study it was found that it is not possible to have a general knowledge about SSCM and SMEs with national investment in Mexico. In fact, it can be said that in these areas there are still several theoretical gaps at a strategic, tactical and operational level, so it is not possible to generalize conceptual and mathematical models, much less generalize this theory between emerging economies and developed countries. Consequently, more research focused on specific Mexican sectors should be specified, which should also consider different methodologies to have a deeper perspective.

The main findings in SMEs show deficiencies in financial matters, formalization, administrative capacity and novel technology, which represents a limitation to compete efficiently. In some SMEs in the manufacturing sector it was observed that they react corrective only to survive in the market, while other SMEs in the primary sector are trying to take a role as a focal company to promote sustainable initiatives in supply chains. This, in short, could serve to generate jobs and self-employment in local populations, which would help to address poverty and even consolidate food security.

SMEs to address SSCM have very different needs. At least in the collaboration and organization of learning, companies depend on several factors, such as the sector to which they belong, the size of the companies, the type of provider and the characteristics of the managers. Therefore, the most important changes should be directed by focal companies with a broad vision and capacity to influence the members of the supply chain, as this will allow them to move towards the SSCM according to the case and the sector to which they belong. In short, the most prominent opportunities for Mexican SMEs to incentivize SSCM are in formalization, integration, design and strategic planning, for which non-controllable factors such as the government and consumers should also be considered, as this will allow them to address themselves towards competitive scenarios.



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