COMUNICATION MANAGEMENT MODEL OF ENVIRONMENTAL ISSUES TO ENCOURAGE THE CONSUMPTION OF SUSTAINABLE PRODUCTS IN CHILE

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1. Introduction

1.1 Sustainable consumption

The concept of sustainable consumption originates as a consequence of a succession of four historical milestones: the First Earth Summit hosted by United Nations in Stockholm in 1972, the Brundtland Report written by the United Nations in 1982, the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 (where the definition of "Sustainable Development" was coined as a systemic relationship between humanity's development and its environment, based on social, environmental, political and economic pillars), and the signing of the agreement known as "Agenda 21" defined in 1992 in the aforementioned UN conference, where a series of actions was established in order to achieve sustainable development.

Within the framework of these actions, and according to the Agenda's chapter 4, "sustainable consumption" is defined as an environmental responsible consumption based on changes in the production and consumption patterns, oriented mainly towards the creation of strategies and national policies related to the protection and use of non-renewable natural resources.

As goals of this type of consumption, the Agenda proposes to encourage production and consumption patterns oriented to reduce environmental stress, still satisfying basic needs of humankind, and generating a better understanding of the role of consumption in environmental care, helping the development of more sustainable patterns of consumption.

However, despite of what was proposed in the Agenda, it is no easy feat to achieve such consumption, mainly because the feasibility of the proposed changes is based on the economic viability of manufacturing sustainable products for this consumption and the demand that such products can have in the different markets. Such demand has not behaved as expected because of three factors.

1. Persistence of a capitalist consumption model inherited from the Post-World War II period and the Industrial Revolution with an economical system sustained on the excessive consumption of products with short life cycles [London 1932] and supplies that become obsolete rapidly which in turn use a lot of energy in their production processes and use highl- contaminant raw materials with a low percentage of recuperation, generating large and uncontrolled waste volumes [McDonough and Braungart 2002].

2. The impossibility to implement global environmental policies and regulations, due to the strong socio-economic inequality, wealthy countries with a lot of economic resources, and poor

countries whose main concern is the survival of their people and not the caring for the environment. [Sandström et al. 2006]

3. Loss of sustainable competitiveness of products due to their higher cost, mistrust of their functional performance, and confusion due to the type of environmental declarations used as references to the products [Bearse et al. 2010].

Regarding these issues, authors such as Mcdonough and Braungart [2002] have proposed that the feasibility to implement changes in consumption patterns and habits proposed in "Agenda 21" is related to the way these new sustainable products can be integrated into a given market context. They also state that the success to stimulate their production and consumption would be determined by a change in the products themselves, not in the consumption patterns, because the latter would destabilize the predominant economic system and would make sustainable development not viable.

Following this logic, since the feasibility of any development is related to its economic viability, it is vital that social consumption needs have to be satisfied with environmentally friendly products, which requires the existence of social demand of these products, as well as their supply [Mcdonough and Braungart 2002]. It is also necessary to have a cultural and legislative environment that stimulates the production and consumption of these products [Krajnc et al. 2004].

In this manner, and according to the background presented, it is possible to identify that the foundation for "Sustainable Consumption and Development" is the creation of a cultural and legislative environment that encourages the side of the offer (production) as well as the demand side (consumption) of these goods.

1.2 Development of sustainable products

The development of sustainable products has gone through several stages. Initially, it was related to the definition of indicators to measure environmental impact based on Life Cycle Analysis (LCA). This was not enough to generate demand for this type of products in the market [Thobanoglous et al. 1994]. Afterwards, Eco-labels were developed as instruments for the management and communication of environmental aspects in a product, in an attempt to differentiate and identify products that are made with respect and care for the environment [Conesa 1996].

Aware of this, the European Commission released a road map towards efficiencies in the use of resources in 2011 (COM [2011] 571 final). It defines as intermediate goals for 2020 to encourage citizens and authorities to acquire products and services that are more efficient, with the right price management, clear environmental information, the establishment of norms for minimal environmental performance, and the elimination of the most contaminant products.

Some authors have developed and implemented other strategies related to the consumption of sustainable products and to the goals of the aforementioned road map. Among these we can highlight Mcdonough and Braungart [2002], whose focus was the development of products manufactured with biodegradable or highly recyclable materials. Related to patterns of consumption, Jacoby et al. [1998] proposed that consumption and decision making are linked to age, social and cultural issues, attitudes, and gender. According to this and with the intention to generate behavioral changes in patterns and habits of consumption, several authors have presented a series of studies and strategies. Among these, we can highlight the works of Buenstorf and Cordes [2008], and Lilley [2009], who expose that the main problems to generate these changes have been the difficulty to experience the advantages of buying these products, since the consumers do not directly appreciate the benefits of a sustainable purchase. Maneiro and Burjillo [2007] have proposed the existence of information asymmetries associated to the use of new raw materials, as well as the ambiguity in the use of indicators in the environmental impact statements in the products. According to Bearse et al. [2010], this situation has caused not only confusion in the consumers, but also mistrust in the functional performance of these products. This, added to the higher cost that sustainable products usually have, becomes a deterrent to the acquisition of these products.

In this way, using the analyses of several authors, it is possible to appreciate that the context for the development of these sustainable products turns out to be very complex, due to the high number of

factors and the variety of parties involved in the definition of legislative and regulatory frameworks for the development of products and manufacturing processes.

2. Purpose and scope of the research

Given the number of variables and factors related to the stimulation of sustainable production and consumption, and with the recent publication of the "Sustainable Production and Consumption Program" [MMA 2015], from the Ministry for the Environment in Chile, the purpose of this research is to propose a model for communication management at a domestic level, to handle environmental information according to the realities of the market, the legislative and regulatory context, and the level of environmental awareness of the local consumer. The scope of this research is limited to the analysis of the international state of the art of the development of models for Eco-labeling, a field study to identify the levels of environmental knowledge and awareness in local consumers, and a revision of the legislative and regulatory framework in Chile.

3. Methodology

We conducted an international review of the state of the art in the use of eco-labels, and an analysis of the operational model of the eco-labels: "Blauer Engel" (Blue Angel) in Germany, "European Flower" from the European Community and "Thai Green Label" from Thailand.

3.1 Field study to identify factors that encourage sustainable consumption in Chile

The field study was conducted in the southern region of Bío Bío. Chile is divided in 15 regions, with the capital region having the largest population divided in highly segmented districts [Adimark 2004], with a per capita income that is different from the rest of the country. According to the census data available, Bío Bío is the second region of the country in employment by the productive sector and also the second region with the most supermarkets with more than three checkout positions [INE 2010]. The region presents a 53.7% of economically active population, which is similar to the figure for the whole country [58.2%] [INE 2014], and the average annual income per household is 627,500 Chilean Pesos, close to the national average of 639,000 pesos [INE 2014].

We chose to conduct the study in a hypermarket chain, because this type of establishment presents the highest concentration of products and industrial sectors in the same space, which would allow us to identify, in a multi-sector manner, the levels of environmental knowledge and awareness of local consumers, the relevant involved parties at the consumer level to manage a sustainable certification in Chile, and the types of indicators that local consumers recognize and comprehend.

Considering the previous points, the study was conducted in the leading hypermarket chain (LIDER, which belongs to Walmart), which has 34% of the national market.

To gather the information required for this study, it needs to be defined as "exploratory", because "there are no previous similar studies, nor is there a precise and clear idea about the phenomenon to be studied", and as "descriptive" because we want to "specify properties, characteristics, and important traits of any phenomenon under analysis that describes trends of a group or population" [Sampieri et al. 2010].

We also determined that the instrument for gathering information should be a survey, to be administered to 200 subjects, with a confidence level of 95%, and a maximum variance that gives an estimation error of 6.93%, according to the average sales of the supermarket where the survey was administered.

3.2 Management model validation

We then built the prototype of the model and validated it through a field study to identify the perception of the consumer and evaluate its effectiveness.

Regarding the universe of customers to be sampled, we had to survey the same universe of subjects and in the same establishment of LIDER hypermarkets, to keep the levels of confidence and the estimation error of the maximum variance, to rationalize the use of resources and expedite statistical processing.

According to previous studies [Cereceda 2014], the industry sector with the most products bearing environmental statements in the local market is home care products. In this sector, the category that has more products is garbage disposal plastic bags.

The Product Category Rule (PCR) defined by the Environmental Product Declarations (EPD) establishes that the environmental indicator for this product should be the carbon footprint.

After defining the environmental impact indicator, we will design a communication strategy for the prototype, adjusted to the level of knowledge and environmental culture of the local consumer, according to the data gathered in the field study. Finally, we will evaluate this prototype through a comparative survey with analogous products that have sustainable characteristics and environmental declarations.

4. Results

4.1 Use of eco-labels

According to the literature review it is possible to appreciate the three factors that make the existence of an eco-label viable: First, the existence of market conditions for its use, which depends on political, social and economic aspects [Taylor Nelson Sofres report 1998], [Olsen and Galimidi 2008], [Bausela et al. 2008], [Regulation (EC) No 66/2010, 2010]. Second, the definition and consensus of indicators to measure and communicate the environmental performance and impact of productive processes [Lim and Moon 2009], [Schumacher 2010], [Golden 2010] and the use of reliable information that lends credibility to the eco-labeling system [Maneiro and Burjillo 2007]. Third, the use of environmental certification procedures to measure the compliance of the requisites of the certification [Hopwoodet al. 2005], [Clarimón et al. 2009], [EEA 2010], [European Union 2012], [BMUB 2013], [TBCSD 2013].

On the other hand, the background we have analyzed enables us to recognize that the main actor that needs to serve as a coordinating institution in order to achieve sustainable development is the central government. It needs to define environmental regulations that optimize the exploitation of natural resources, generating economic policies that encourage changes in social behaviors [Brezet and Van Hemel 1997], [Clarimón et al. 2009].

Regarding the creation of environmental norms, the analysis of national models and strategies for sustainable development identified that the definition of these norms should consider the productive reality and social and cultural patterns of each region of the country [De Vries and Petersen 2009], [Baumgartner 2011]. Since these regulations are oriented towards the protection of resources, the decisions to be made will be closely related to the economic system [Jegatheesan et al. 2009]. This is why this sector must also be included in the process, as well as scientific representatives that help in the definition of indicators and systems for the measurement, monitoring and control of results [Hopwoodet al. 2005], [Gallagher 2009], [Baumgartner 2011].

To stimulate changes in social behaviors, it is possible to identify the need to improve educational policies [Peattie 2010], the creation of a context that is favorable to the application of this political and economic policies [ESI 2005], [Volkery et al. 2006], [Clark and Lund 2007], and the implementation of environmental laws structured based upon Life Cycle Assessment and the enforcement of ISO 14.040 and 14.025. The latter is designed to promote multisector sustainable production and consumption [Tchobanoglous et al. 1994], [McDonough and Braungart 2002], [Clarimón et al. 2009], [Behrisch et al. 2011]. As a scientific party, it is possible to recognize that this is represented by universities and research institutes, that help in the definition of indicators to measure environmental impact [Parris and Kates 2003], [Van Kerkhoff and Lebel 2006], including the measurement, monitoring and control systems that optimize the use of natural resources and minimize the consumption of energy in manufacturing processes.

Finally, with this background, it is possible to state that the interaction amongst political, economic-productive and social actors revolves around the central government and the way the central government can articulate them, is through the design and implementation of plans for environmental education and political-economic strategies that encourage multi-sectorial sustainable production and consumption to generate changes in behaviors and also in the social habits of production and consumption.

4.2 Environmental certification, relevant actors and level of environmental knowledge and awareness of Chilean consumers

Regarding the environmental certification, 97% of local consumers believe that the Environmental Ministry should certify all sustainable products (47%), because this would provide credibility to the environmental information presented (88%). Consumers in developed countries expressed similar beliefs, since international studies state that 89% of consumers are concerned by the use of erroneous environmental information [AFGC 2010], [Sustainability Consortium 2010].

Regarding the relevant actors that should guide sustainable production and consumption in Chile, those surveyed recognized that the government should lead these processes (41%), issuing norms that regulate the environmental information that will be used in sustainable products (67%). This finding is consistent with other countries, according to the study mentioned in the previous section, where eco-labels depend on a ministry or environmental protection governmental agency.

Another interesting finding is related to the role of consumers to stimulate sustainable production in Chile, where 32% of those surveyed think their role is to put pressure on the government to issue regulations that stimulate the supply of this type of products, and 29% think they should prefer sustainable products, even if their sales price is up to 10% higher.

Regarding the considerations to acquire a sustainable product, environmental considerations do not influence the purchasing decisions of the Chilean consumer, because 73% of them do not know if they acquired sustainable products in their last purchases. This is similar to Australia, [AFGC 2010], where 80% of consumers declare to consider environmental issues in their purchases, but only 13% had purchased a sustainable product when surveyed.

On the other hand, it is also possible to identify the factors that have a negative impact on their purchasing intentions, such as higher pricing (27%) and lack of knowledge of materials and functional performance (18%). This is similar to what was found in the United States [Bearse et al. 2010], where most consumers are influenced by price and performance when selecting a product.

In relationship to the environmental impact of a product, Chilean consumers perceive this type of impact in the waste a product generates (37%), and its associated manufacturing processes (25%). As the largest source of environmental pollution associated to the consumption of products, the consumers surveyed recognized industries (46%) and the waste generated by all of us (36%). Finally, when asked how they think that the environmental impact associated to the consumption of products could be reduced, the surveyed consumers declared that they could prefer recyclable products (47%) and sustainably produced products (30%). These figures are the only ones that present a difference with international results, where during a study conducted by the Sustainability Consortium in nine countries in 2010, surveyed consumers declared that they perceived the environmental impact of a product mostly in its packaging (26%) and the use of the product during its lifecycle (22%).

4.3 Environmental legislative framework in Chile

In terms of environmental regulation it is possible to find only seven norms/regulations where two of them refer to incentives, two more are related to packaging or certifications and the remaining three refer to the creation of public and semipublic organisms and the approval of regulations related to the supervision, oversight, promotion, research and development of sustainable production activities.

Regarding the political legislative context, an analysis of the laws related to sustainable consumption and production in Chilean legislation shows two laws, one of them recently passed in June of 2015.

The first law, N° 19.496, was passed in 1997, and its most recently modified in 2005. This law was emitted by the National Consumer Service [SERNAC] and has 61 articles where only two of them refer partially to the sustainable consumption issue.

The second one was approved in June 2015 and regulates the framework for waste management and extended responsibility to the producer, known as the REP law. This law "compels companies, manufacturers and importers of high-priority products, to dispose properly of their products once their life cycle finishes" [MMA 2014].

Given these results and understanding that regulations can be voluntary, it is possible to show that there is an incipient environmental protection policy oriented towards sustainable production and consumption in Chile.

4.4 Communication management model design for sustainable products in Chile

According to the analyses performed to sustainable development strategies and to the eco-label models, and the results found in the field study and the Chilean environmental laws, it is possible to conclude that, in order to attain the consumption of sustainable products in Chile, it is necessary to have a communication model of environmental aspects to stimulate a change in the way to consume. Such a model would lend credibility to the handling of environmental information and would encourage purchase decisions. This model should be composed of four pillars (Figure 1); First, the "Definition of indicators and environmental norms" written by the Ministry of the Environment, with 6 committees: political, scientific, environmental, entrepreneurial, economic and social, where each committee has to be comprised by representatives that are recognized, validated and considered relevant at the regional and national levels.

Second, the design and implementation of an environmental certification that regulates, validates and monitors the use of environmental information for the consumers.

Third, a mixed strategy between suppliers and distributors, coordinated by the Environmental Ministry, to identify and classify the sustainable products offered in commercial establishments, so the recognition of sustainable products in points of sale is easier.

Fourth, the design of a strategy for the communication of environmental aspects adjusted to the cultural, knowledge and environmental conscience of the local consumers that contemplates the environmental information that is regulated, managed and certified by the Environmental Ministry with mixed, direct and easy to understand, quantitative, qualitative, and concrete (not ambiguous) indicators.
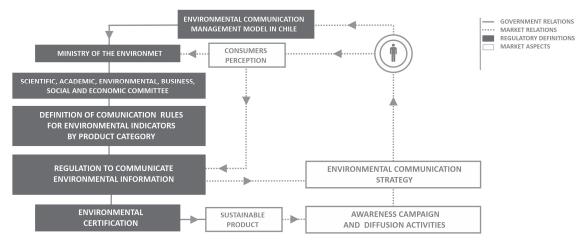

Figure 1. Communication management model for sustainable products in Chile

4.5 Validation of the communication management model of environmental issues for sustainable products in Chile

According to the results presented in sections 4.1 through 4.3, we designed two eco-labels. The first one presents a quantitative carbon footprint indicator, according to a Chilean regulation (that still does not exist), and the second one, a qualitative certification for sustainable product, awarded by the Ministry of the Environment (which does not exist either).

We applied both labels to the prototype and performed a comparative survey with analogous products in the hypermarket. We could identify that the proposed model is effective, because 88% of the subjects declared that the use of both labels gave them confidence and would make them prefer the prototype.

When we used a carbon footprint eco-label, in a language accessible to the customer, 86% of those surveyed declared that this information did help them understand the environmental impact of the product. Fifty-seven percent (57%) declared that this information made them prefer the prototype, even if it was more expensive, even though 53% declared they were not sure of the meaning of a carbon footprint, but they recognized its importance in the environmental impact of a product.

5. Discussion and conclusions

From the analysis of the literature and fieldwork, it is possible to conclude that in order to attain the consumption of sustainable products in Chile there are two milestones that have to be considered: first the generation of behavioral changes and consumption habits and second an environmental education in consumers and manufacturers.

Regarding the behavioral changes, the theories, models, and strategies of sustainable development we analyzed, say these changes can be attained through two paths: a specific one (short term) and a structural one (long term):

- The specific changes allude generally a particular behavior or habit that can be changed in the short term through political-economic strategies like tax increases or fines, measures that clearly cannot generate profound or extensive changes.
- Structural changes pose the possibility of profound transformation at a cultural and educational level, assimilable on a long-term basis with a lot of work to be done including interaction and compromise of political, economic and social actors involved.

With respect to environmental education, the high percentage of local consumers that declared they did not know if they had acquired a sustainable product in their last purchase, and the correct recognition of the environmental impact of a product among those surveyed, lead us to recognize that a campaign for environmental awareness should be centered around increasing the environmental consciousness levels in consumers and the positive impact of purchasing a sustainable product.

With respect to the changes in behaviors and consumption habits presented in this discussion, as well as the importance of environmental education, it is possible to state that the use of reliable environmental information, as well as a governmental regulation recognized and validated by consumers, are instruments of environmental management that would help to encourage demand of sustainable products, because the local consumer declared that the use of such instruments would help them to understand the environmental impact of a product and would encourage them to purchase sustainable product, even if these had a higher price.

According to the results obtained, it is possible to conclude that, in order to stimulate sustainable consumption and production in Chile, three fundamental milestones are required:

- That the Government generates the market condition to encourage the commercialization of sustainable products, using political-economic strategies such as subventions and tax breaks to sustainable companies.
- That the Ministry of the Environment establishes, along with academic, industrial, scientific and social sectors, an environmental certification system that has goals, deadlines, and levels of certification, to facilitate and expedite its implementation in local companies.
- That society at large raises its level of environmental awareness and recognition, through environmental sensitization and education campaigns lead by the government, through mass media and in distribution points.

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DESIGN METHODS