Analysis of organizational management and supply chains in ecotourism companies of Lejanías, Uribe and Mesetas (Meta-Colombia)

Gerardo Avendaño-Prieto
Faculty of Business Administration, EAN University
Bogota Colombia
gavendanop@universidadean.edu.co

William E. Mosquera-Laverde
Faculty of administrative and economic sciences
Universidad Cooperativa de Colombia
Bogotá D.C., Colombia
williame.mosquera@campusucc.edu.co

Oscar A. Vásquez-Bernal
School of Basic Sciences, Technology and Engineering
Universidad Nacional Abierta y a Distancia - UNAD
Bogotá D.C., Colombia
oscar.vasquez@unad.edu.co

Abstract

Promoting the correct implementation of organizational management and effective supply chains in the regions of Colombia affected by the armed conflict is complex and difficult, therefore, the research shows a way to integrate tour operators of the populations of Mesetas, Uribe, and Lejanías for the economic development of the country actively, for it, the categories to be studied were looked for and of them six instruments were designed that allow to diagnose the tourist operation, with which, the shortcomings in administrative management, marketing, financial and supply chain. With which, protocols and guides for easy-to-use web applications were designed and delivered a technological tool that helps improve the income and logistics and business management of these tour companies.

Keywords
Ecological marketing, organizational management, technological tool, logistics, supply chains.

Introduction

This research consists of an exploratory study of organizational management (Arellano, 2013) to learn how the tourism sectors in the Meta department have evolved, focused on the municipalities of Lejanías, Uribe, and Mesetas, diagnosing how their organizational structure and chains are of supply to have a point of reference of how it is implemented in large hotel industries. With the support of the Ministry of Tourism and Commerce that promoted visiting all the operators that are located in the populations under study; In this way, the organizational management models and models will be identified, the technical norms that are currently being implemented in the tourism sector will be determined, and if they are being applied to promote ecotourism so far.

To analyze the organizational aspects that implement its business model with the collaboration of the Noesis strategic and Induspymes research groups of the Universidad Cooperativa de Colombia and the Sennova group of the National Apprenticeship Service (SENA), it begins with a systematic literature review from secondary sources where factors such as the environment, safety, ecotourism, the quality of tourism are chosen. And from these factors several
instruments are designed to know and value the services and characteristics of the places where it is expected to provide the hotel service, so that, not only can they satisfy the needs of tourists, but they also contribute to the society of these places, which is the sector of the eastern plains in the department of Meta that covers the municipalities of Lejanías, Uribe, and Mesetas (Riaño, 2015).

As a result, contribute to the care of the environment and that can provide a new organizational model in tourism (Mosquera, 2018) and not only that, but also, these areas will benefit economically, since through ecotourism more jobs will be generated than contribute to the integral development of Colombia. Especially in post-conflict zones, supporting the objectives of Sustainability. In addition, support for the implementation of the technical standard NTS - TS 002, which will be a guide in which it will verify if the hotels or tourist sites are implementing sustainability in the tourism industry, if the management for sustainability is being implemented, the identification of environmental socio-cultural and economic aspects and impacts, in turn, this will also allow us to know what documentation and legal, environmental, socio-cultural and economic requirements should be made, as well as what are the evaluation criteria for the granting of the certificate of tourist quality.

1. Methods

It begins with a review of the existing bibliography, where it was found that, despite the development of several studies of biodiversity management, environmental impact and sociological studies in some regions, there is no research focused on aspects related to the management that can be improved to make ecotourism companies development axes, sustainable over time and allowing regional socio-ecological growth. For this reason, it can be affirmed that it is a subject or research problem little explored as shown in table 1.

| Table 1. Study Category. |
|---|---|
| **TOURISM** | **ENVIRONMENTAL EDUCATION** |
| **Category** | **Dimension** | **Sub-dimension** | **Category** | **Dimension** | **Sub-dimension** |
| **ORGANIZATIONAL** | Procedures | Poverty Reduction | **ECONOMIC DEVELOPMENT** | Income enhancement | Education access |
| | Control | Health service enhancement | | | Food insecurity |
| | Operation | Back housing | | | |
| **PRODUCT - SERVICE** | Design | Quality of Life | | | |
| | Passionality | | | | |
| | Price | | | | |
| **MANAGEMENT** | Procedures | Social improvement | | | |
| | Control | Prospective | | | |
| | Policies | Social Content | | | |
| | Implementation | | | | |
| **ENVIRONMENT** | Conservation | Associates | | | |
| | Design | Neighbors | | | |
| | | Improvement | | | |
| | Preservation | | | | |
| | Functionality | | | | |
| | | | | | |
| | Mitigation | | | | |
| | | | | | |
| **IMPLICATIONS OF COMMUNITIES** | Employability | | | | |
| | Strategic | | | | |
| | Mission | | | | |
| | Families | | | | |
| **BENEFICIARIES** | Gender | | | | |
| | Quality of life | | | | |

Being an exploratory study, there are no clearly identified variables, which implies that an experimental study cannot be done. Therefore, what is sought is the observation of organizational, administrative and social management processes, as they occur in their natural context, to be analyzed later. Therefore, a situation is not constructed, but they are observed and inquired about the processes used in conditions in which we cannot interfere; but what help us to find the answers to the problem statement. Also, it is important to clarify that the data collection will be done at a specific time and to a single sample, so its design is: not experimental, transversal.

For the collection of the information, semi-structured interviews were carried out with the managers of the ecotourism units and direct observations on the processes related to socio-ecological management in the area. The semi-structured interviews involve a detailed analysis of the information to guarantee its reliability and validity, this implies a revision from the language, as much in the syntactic as in the semantic and the semiological. Now, these interviews will be crossed with direct observations of the processes that allow to establish the way in which the organizational and administrative management is being done. In this sense, a testing process will be carried out between the two instruments that will then be discussed in a group interview, in this way the triangulation will be completed. Thus, through the analysis of the data the familiarization of the topic under study was achieved, in this case the factors related to the organizational management that can be improved or implemented in the companies located in the post-
Conflict zone of Mesetas, Lejanías, and Uribe and we identify the essential components for a participatory and collaborative tool for business and social growth.

1.1. Delimitation of population and sample
Protected areas in Colombia with real ecotourism development are scarce, only 8 of the 28 possible zones have any application of the Colombian ecotourism policy and therefore organizations with management processes that allow their sustainability and regional development, which is why Take the Meta area. Because it is an exploratory study with the purpose of determining trends or identifying potential relationships with a view to subsequent investigations of a descriptive or correlational nature, this project will work with a discretionary sample of 8 tourist sites for convenience.

1.2. Data collection phase
According to the specific objectives the data collection was carried out in three moments and from three techniques: (one) to describe the organizational and administrative management processes of the ecotourism business units, semi-structured interviews will be carried out with the people in charge of the unit of business or ecotourism company within the selected group; (two) to evaluate the socio-ecological contribution, as well as to establish the social and educational management will develop a direct non-participant observation. In the end, to contrast the results, (three) a group interview will be done with a representative number of the managers of the companies or ecotourism business units studied.

The semi-structured interview is a special form of interview where, from the verbal interaction between the interviewer and the interviewee, despite the existence of a questionnaire, enough flexibility is generated to know the process of organizational management through oral reconstruction. Thus, through the story you can identify what are the processes used for it, as well as the motivations for these forms of organization. The interviewee by means of his explanations will show to what extent he knows and implements processes of organizational and administrative management that allow the sustainability of the companies and the social, ecological and economic development of the region, taking into account the participation of the community. Additionally, the instrument aims to establish the primary needs of managers facing information management, education and socio-environmental contributions. In such a way that the interviewee shows the type of additional training requires or would need to use as support to socio-ecological development as an economic pillar. To carry out the interviews, a questionnaire was designed to guide the inquiry and a syllabus that will be delivered to the interviewee previously. The validation of these two tools was carried out by means of the presentation to four qualified evaluators both in research and in the subject.

It is important to clarify that since it is a doc instrument, it can vary according to the needs of the research and the special conditions of each company. However, it is this same characteristic that justifies its use within the study, since, as it is a semi-structured interview, the interviewers will have the opportunity to deepen the inquiry in a spontaneous and direct dialogue. In this sense, it is an ideal instrument to capture the process, object of study, since it is a changing reality in which the general tendencies among the different companies must be found. In addition, with it you get a level of depth and detail difficult to achieve with other techniques. The interview is individual or collective has the freshness and vitality of personal exchange and can be complemented very well with inquiries such as direct observation.

The non-participant direct observation on the organizational and administrative management allowed to establish the problems of implementation and operation that can make it difficult for ecotourism to become an economic pillar of the region. In it, the data were collected from a series of protocols and guides, as well as "interrogating" the observed individuals. This technique allows to observe the phenomenon carefully, take the information and register it for later analysis. In addition, it allows the acceptance of unstructured material, as well as working with large volumes of information, which is why it is convenient for exploratory studies such as the present one.

To keep a systematic, valid and reliable record of the organizational and administrative management implemented to comply with the principles of ecotourism and corporate sustainability, once the universe of aspects to be observed through the interviews has been defined. The categories will be established, coding will proceed, and the observation protocols will be elaborated, which will serve to give reliability and validity to the observation. Subsequently, two actions were carried out: (one) survey of management processes by means of flow charts and (two) a list of the aspects, procedures and activities that influence organizational, administrative and socio-ecological
management for growth will be established of the region, in such a way as to serve as an initial point for the establishment of the observation units and categories.

Finally, after analyzing the information obtained in the interviews and direct non-participant observation, a group interview will be conducted with a representative number of ecotourism managers who participated in the process in order to contrast the analysis with the vision they have.

### 1.3. Phase of data analysis

Once the field work is developed, the transcription of the interviews to the ecotourism managers of the companies or business units under study is carried out, in such a way that the clarity and literalness of the story is guaranteed. Subsequently, a typological analysis will be carried out for which categories that classify the material collected according to the need of the investigation are introduced.

To achieve the above, the following phases were carried out: careful reading of the information obtained in order to establish the categories of analysis; coding of these categories to facilitate their recognition in all stories or interviews; then proceed to the evaluation of the meaning and recurrences through the development of semantic and comparative tables. The entire methodological structure is shown in Figure 1.

![Figure 1. Instruments.](image)

For the access to the informants an informed consent was obtained for the use of the information, in the same way, the companies to be included in the project must initially sign a letter of intent and then a commitment in which they allowed us to make visits for field work and use of the information collected, respecting the privacy and good name of the people and institutions that collaborate with the project. The researchers agree not to give any information that could be used against the interviewees and their institutions.

Once the non-participant direct observation was carried out, the material was organized and systematized in order to identify the management processes and the needs of the region from the social point of view, which is the second specific objective. Simultaneously with this, flowcharts were developed for the description of the managements, which is the third objective. With the above, the specific objectives stated are met. However, to achieve greater reliability in the result a group interview will be conducted with some of the ecotourism managers interviewed, in which the results will be presented, and they will be asked what they think about the results and about the specific training requirements that have. This in order to complete the triangulation of the information. Through this process we can contrast the conjectures raised and develop a general theory about the characteristics of the decision-making process in small businesses, as well as establishing variables or categories for subsequent investigations of a descriptive nature.
2. Theoretical framework

The theoretical pillars of this project are: The municipalities under study, ecotourism and post-conflict, in order to understand the importance of the study as follows:

2.1. Municipalities under study
These are in South America, within Colombia and the department of Meta, within the eastern plains, especially the municipalities of Mesetas, Lejanias and Uribe as seen in Figure 2.

![Figure 2. Geographical location of the study (CODAZZI, 2018)](image)

Therefore, the study of the three areas where it can be evidenced that administrative management has been implemented for such reason, we can say that initially the economic perspective of Lejanias is focused on the agricultural sector is how we basically find that it is the agricultural sector which has more relevance unlike the farmer.

"The most representative crops are: Citrus, Pear Guava, Cocoa, Coffee, Beans, Passion Fruit, Pineapple, Blackberry, Avocado, Soy, Papaya, Lulo, Banana, Cane Panlera, Traditional Maize, Technified Maize, Arazá, Moni, Pisciculture and Poultry." (Digital, Mayor of Lejanias, 2018). On the other hand, in terms of the economy of plateaus, half of the inhabitants of the urban population are linked to the agricultural sector and in the rural sector the vast majority live off agriculture, the main crops are: corn, coffee, cocoa, banana, cane, fruit and citrus. "The cattle activity is the one that more income it generates to the producer with a contribution of 74.1% according to the municipal code 50330 of plateaus" (Digital, City hall of Mesetas, 2018), nevertheless, the bovine benefit is made of general way employing races meat producers within which zebu and san mariner stand out. In the Uribe, meta economy has a greater focus on the construction of civil engineering works, then this municipality focuses on livestock production and hunting thus generating a great contribution to the municipality, in addition to receiving income from direct sale of livestock and milk, some producers receive other income within the livestock line such as those coming from the sale of pasture and the lease of paddocks. (META, 2016)

2.2. Ecotourism
The term ecotourism was coined by the Mexican architect Héctor Ceballos-Lascurain in 1983, who since 1971 worked in the planning and development of sustainable tourism in all its aspects. Ceballos-Lascurain defines it as: "the execution of a trip to natural areas that are relatively undisturbed or polluted, with the specific objective of: studying, admiring and enjoying the panorama with its plants and wild animals, and likewise any manifestation cultural (past and present) that is found in these areas, which fosters an active and socioeconomically beneficial involvement of local populations" (Ceballos 1998).

The relationship between tourism and ecology is: making the activity of leisure and recreation a time to enjoy and enjoy, save and respect nature; make known without damaging the environment (Gonzales, 1999). Ecotourism also proposes new alternatives to tourists based on sustainable development, seeking recreation and education through: the observation and study of natural values, producing a minimal impact on natural ecosystems.
An important portion of the income generated by these ecotourism activities are destined to the promotion and conservation of the natural areas in which it is carried out. The World Tourism Organization (WTO) defines it as: "all forms of tourism in which the main motivation of tourists is the observation and appreciation of nature and that contribute to the conservation of the natural environment and cultural heritage with the less possible negative impact" (UNWTO, 2002). This organization also recognizes that, in addition to actively contributing to the conservation of natural and cultural heritage, ecotourism includes local and indigenous communities in their planning, development and operation, therefore it is better suited to independent travelers, as well as circuits organized for small groups. Ecotourism considers the principles of sustainable tourism regarding the economic, social and environmental impacts of tourism; but, it differs from the general concept of sustainable tourism in that it actively contributes to the conservation of the natural and cultural heritage, includes the indigenous communities contributing to their well-being, interprets the natural and cultural heritage of the destination for visitors and lends itself to a low flow of visitors (Vasquez, 2018).

Sustainable development is linked to the social development of the area to be conserved; therefore, sustainable tourism applies to all forms of tourism and all types of destinations, including mass tourism and different segments. The principles of sustainability refer to the environmental, economic and sociocultural aspects of tourism development and the balance that these must have in the long term. Thus, sustainable tourism must ensure the optimal use of natural resources, respect the sociocultural authenticity of the host communities and ensure socio-economic benefits for all those involved (Mosquera, 2018), as can be seen in Figure 3.

2.3. Ecological marketing

Due to the interest in nature tourism and concerns in the deterioration of ecosystems, has resulted in the inclusion of the natural environment as an object of analysis of various disciplines including marketing that must assume a new behavior in front of the environment; since consumers seek products and services that incorporate the environmental variable. Therefore, the tourism managers try a better positioning implementing marketing strategies whose competitive variable is the ecological aspect.

Emerging from the above, a marketing derived from the consumer-environment relationship that involves the needs of the client aware of the importance of preserving nature and to which various denominations are attributed: ecological marketing (Fisk 1974, Hennion and Kinnear 1976); green marketing (Peattie, 1992); environmental marketing (Coddington, 1993); eco-marketing (Fuller and Butler, 1994) and sustainable marketing (Fuller, 1999).

Therefore, it is understood that environmental marketing encompasses the marketing activities that assume environmental management as the development of the responsibility of the company and as an opportunity for growth for it, being a change of perspective in the way of doing business and which demands a global commitment from the company (Coddington, 1993).
It is also possible to understand, as a green marketing where all the activities tend to generate and facilitate any change with the objective of satisfying the human desires or needs with the least harmful impact on the environment (Polonsky, 2006).

This marketing includes a set of communication policies and strategies (promotion, publicity and public relations, among others) aimed at obtaining a comparative advantage of differentiation for the products or services offered by the company in relation to competitive brands, thus achieving increase market share, consolidating its competitiveness (Dias, 2006) where the following conditions are included:
1.- It must be in a process of integral management.
2.- Responsibility in the identification, anticipation and satisfaction of the demands of the clients.
3.- Guarantee society that the productive process is profitable and sustainable.
4.- Marketing strategies executed within an environmental ethic that covers the entire company (Ottman, 1994: 56).

2.4. Post-conflict
To speak of post-conflict, one must first recognize the existence of a conflict and its essential characteristics; in order to achieve the greatest clarity about the limits and expectations that the nation must think and develop about a society in the scenario of a specific post-conflict type. Because in the administration of former President Uribe Vélez, a heated debate was presented about whether the public order situation in Colombia corresponded to a conflict, in terms of the definition that the International Red Cross built in 1977 or if it was simply the Physical manifestation of terrorism against the State by common criminals. The debate that as such had no solution in the eight years of Uribe Vélez’s presidency was solved in the first Santos administration, when the peace dialogues were institutionalized. The advent of the latter recognized the historical reality of a conflict between the State, “its armed forces and dissidents armed forces or organized armed groups that, under the direction of a responsible command, exercise on a part of said territory such control that they allow sustained and concerted military operations "(Cruz Roja, 1977)

According to the previous definition and the actual situation in the country as shown in Figure 4. In the country, protected areas are highly influenced by groups outside the law or in armed conflict with the state, which is a point to consider when developing the post-conflict, since, not having clear policies and actions towards these areas can have more degradation of ecosystems and human displacement.

Figure 4. Map of armed influence and natural parks (Barreto, 2014)
With the recognition that the Santos administration made of the existence of the internal conflict, it opened the need to inquire about the historical roots of it. This search in time, despite the restriction suggested by thinking about the Colombian conflict in FARC terms against the State, has allowed a revision of the constitution and evolution of the political, economic and socio-cultural structures that have fueled the conflict for decades. Due to the above, the points of final agreement that are shown in figure 5 were reached. Where, points 1 and 5 are related to the areas in conflict and the protected areas and this is where a socio-ecological project takes great relevance and relevance.

<table>
<thead>
<tr>
<th>Points with agreements</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural development policy</td>
<td>1</td>
</tr>
<tr>
<td>Political participation</td>
<td>2</td>
</tr>
<tr>
<td>Solution to the problem of the illicit drugs</td>
<td>3</td>
</tr>
<tr>
<td>4   Victims</td>
<td></td>
</tr>
<tr>
<td>5   End of conflict</td>
<td></td>
</tr>
<tr>
<td>6   Implementation, verification, and endorsement</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. Points of final agreement (Barreto, 2014)

Finally, post-conflict is understood as "a situation of exit or overcoming the war that proposes the establishment of concertation and negotiation processes in which, directly or indirectly, the different armed and social actors that are part of the conflict participate." (Pérez, 2011). For Cárdenas Rivera (2003) the ideal in the Colombian case is to speak of an armed post-conflict; that is to say "the period that begins from the moment in which the dialogues of agreement and negotiation of the internal armed conflict acquire a character of inalterability, even when elections are held subject to the different agreements and conditions agreed upon in the negotiation. In this way, the institutional recognition of irregular armed actors arises, and the government promotes the design and execution of public policies aimed at the reconciliation of the whole society. "It is important to remember that the decision of the actors in the negotiation is to build the overcoming of the war, in the middle of the military confrontation. The questions that arise in this point are: to overcome the war for what? What is the project of environmental preservation that Colombia hoists after the signing of the agreements? How will the victims and demobilized be protected so that they have a better quality of life? Are we talking about a post-conflict or a few post agreements?

3. Results
An analysis of the Likert type was carried out which resulted in tourism managers having no knowledge of administrative processes, customer service management, with respect to tourism agents, accommodation. Based on these findings it is intended to establish an administrative management model in the three study areas where training is offered to tourism managers based on the technical standard of the Colombian sector NTS-ST 002 to be the differentiating factor in these municipalities.

According to the results issued by the Likert scale focused on Marketing, we analyzed the demand of the areas of attraction, where there are clearly deficiencies in the frequency of visits to these places, which are only visited on Sundays and holidays, during the year, and customers have a potential attraction at the national level, one of the possible causes is the lack of a marketing strategy for customer loyalty.

Additionally, it can be analyzed that the information of the tourist managers before being visited was through "word of mouth" and some through Internet; therefore, there are no disclosure strategies to publicize the services offered by each manager.

4. Conclusions
Therefore, a customer service protocol is created that facilitates the improvement of the quality of the service taken from the administrative focus where the following actions should be known and implemented.

Consider the personal image as part of the service: The personnel must present themselves to their neat workplace and with a uniform in perfect condition, showing an image of professionalism, order and neatness in the service. The
proper presentation of men is to be well shaved and combed and women without excess jewellery, perfume or makeup;
show availability by serving and helping customers; Turn complaints into opportunities to improve

Once detected the shortcomings of promotion and disclosure of the managers we can propose as strategies of
disclosure of tourism managers in interactive sites as follows, the first thing we must establish is the image and tourism
vocation of the municipalities, and how they should highlight on the other aspects that highlights the territory, in this
case we will focus on ecotourism.

Our strategies to contribute to the development and strengthening of tourist gestures are the following. For example,
validating one of the most recurrent WEB applications to acquire tour packages is “Despegar”, where it is evident that
these places do not have agreements to be known and customers access the services they provide; In this way we can
start creating agreements or alliances so that the managers register in them, not only as accommodations but also as
activities

References

Fondo de Cultura Económica.

Ceballos Lascurian Hector. 1998. Ecoturismo, naturaleza y desarrollo sostenible, Pg. 5. editorial Diana, México.

La guia del ecoturismo. Mundi-Prensa Libros.: https://scholar.google.es/scholar?cluster=4973546624603655708&hl=es&as_sdt=0.5

Dias Reinaldo (2003). Estudios prospectivos en turismo. Obtenido de ESTUDIOS PROSPECTIVOS EN TURISMO:
http://www.redalyc.org/articulo.oa?id=18071386004


https://www.siigo.com/blog/empresario/sistema-de-gestion-administrativa/

https://intranet.meta.gov.co/secciones_archivos/461-53533.pdf

https://repository.unimilitar.edu.co/bitstream/handle/10654/6330/trabajo%20de%20grado%200101487.pdf;jsessionid=356E75D15E7306D7D1205B568D37F2?sequence=1


Rosario, u. d. (s.f.). urosario.edu.co. Obtenido de http://www.urosario.edu.co/jurisprudencia/jurisprudencia-reconciliacion/ur/Postconflicto/

Café Pergamino y Sus Derivados, en el Municipio de, Mesetas.

UNWTO, Quebec Declaration on Ecotourism 2002.

organisations and the impact of road projects on biodiversity in Colombia. World Trans. on Engng. and

Vilches, A. G. (2014). «La transición a la Sostenibilidad (o Sustentabilidad) como [r]evolución cultural, educativa,
tecnocientífica y política». Obtenido de <http://www.oei.es/decada/accion.php?accion=1>
Biography / Biographies

Gerardo Avendano is a full-time professor at the EAN University in Bogotá Colombia with more than 20 years of experience in teaching and research and management at prestigious universities and national and international companies. Experience in the industry in the area of production and quality, as well as in personnel management and group work. Author of scientific publications such as books, articles in indexed journals and software development. Postdoctor in Statistical Process Control SPC Penn State University (State College, USA 2007). Ph.D. Polytechnic University of Valencia (Valencia - Spain, 2004). Specialist in Advanced Statistical Methods for the Improvement of Productivity and Quality Polytechnic University of Valencia (Valencia Spain 2001). Specialist in Production Engineering of the District Francisco José de Caldas Bogotá Colombia (1998). Chemical Engineer National University of Colombia (1994).

William E. Mosquera-Laverde graduated as chemical engineer from the National University of Colombia, in 1993; Specialist in Higher Education at a Distance, National Open and Distance University - UNAD, in 2010 and full master’s in environmental management, University of the Andes, Bogota in 2014. Professor of Environmental Management at the Universidad Cooperativa de Colombia, co-researcher of the Strategic Noesis Group (UCC), Director of the Seedbed Ecoestrategicos 023. Assistant professor Researcher, Business Administration Program, courses oriented Environmental Management, Operations Research, Quality Management, and Finance. I work with the UCC's entrepreneurship center and sustainability management in vulnerable communities and as a consultant to industrial companies since 1995.

Oscar A. Vasquez-Bernal is an Associate Professor in the School of Basic Sciences, Technology and Engineering at Universidad Nacional Abierta y a Distancia, Bogotá Colombia. He earned his Ph. D. in Engineering at Universidad Nacional de Colombia, Masters of Business Administration from UNAD Florida USA, and is BS in Industrial Engineering from Universidad Antonio Nariño, Colombia, He has published several journal articles and conference papers. Professor Vasquez-Bernal has been involved in projects with manufacturing and engineering companies. He is a management consultant in quality assurance, project management and safety management. He has taught courses in entrepreneurship, strategy and corporate logistic and innovation for engineers. His research interests include certification, accreditation, multi-criteria decision analysis and optimization. He is member of NFPA, LACCEI and IEEE.