

Volume 5, Issue 8 — January — June — 2021

# Journal-Urban-Rural and Regional economy

ISSN-On line: 2524-2083

**RINOE<sup>®</sup>**

## **RINOE-Republic of Peru**

### **Editor in chief**

BUJARI - ALLI, Ali. PhD

### **Executive director**

RAMOS-ESCAMILLA, María. PhD

### **Editorial Director**

PERALTA-CASTRO, Enrique. MsC

### **Web designer**

ESCAMILLA-BOUCHAN, Imelda. PhD

### **Web Diagrammer**

LUNA-SOTO, Vladimir. PhD

### **Editorial Assistants**

REYES-VILLAO, Angélica. BsC

### **Translator**

DÍAZ-OCAMPO, Javier. BsC

### **Philologist**

RAMOS-ARANCIBIA, Alejandra. BsC

**RINOE Journal-Urban-Rural and Regional economy**, Volume 5, Issue 8, January-June 2021, is a journal edited semestral by RINOE. La Raza Av. 1047 No.-Santa Ana, Cusco-Perú. Postcode: 11500. WEB: [www.rinoe.org](http://www.rinoe.org), [journal@rinoe.org](mailto:journal@rinoe.org). Editor in Chair: BUJARI - ALLI, Ali. PhD. ISSN: 2524-2083. Responsible for the latest update of this number RINOE Computer unit. ESCAMILLA-BOUCHÁN Imelda, LUNA-SOTO, Vladimir. PhD, La Raza Av. 1047 No.-Santa Ana, Cusco-Perú. Postcode: 11500, last updated June 30, 2021.

The opinions expressed by the authors do not necessarily reflect the views of the editor of the publication.

It is strictly forbidden to reproduce any part of the contents and images of the publication without permission of the National Institute of Copyright.

# **RINOE Journal-Urban-Rural and Regional Economy**

## **Definition of the Journal**

### **Scientific Objectives**

Support the international scientific community in its written production Science, Technology and Innovation in the Field of Humanities and Behavioral Sciences, in Subdisciplines of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy.

RINOE® is a Scientific and Technological Company in contribution to the Human Resource training focused on the continuity in the critical analysis of International Research and is attached to CONACYT-RENIICYT number 1702902, its commitment is to disseminate research and contributions of the International Scientific Community, academic institutions, agencies and entities of the public and private sectors and contribute to the linking of researchers who carry out scientific activities, technological developments and training of specialized human resources with governments, companies and social organizations.

Encourage the interlocation of the International Scientific Community with other Study Centers in Mexico and abroad and promote a wide incorporation of academics, specialists and researchers to the publication in Science Structures of Autonomous Universities - State Public Universities - Federal IES - Polytechnic Universities - Technological Universities - Federal Technological Institutes - Normal Schools - Decentralized Technological Institutes - Intercultural Universities - S & T Councils - CONACYT Research Centers.

### **Scope, Coverage and Audience**

RINOE Journal-Urban-Rural and Regional Economy is a Journal edited by RINOE® in its Holding with repository in Peru, is a scientific publication arbitrated and indexed with semester periods. It supports a wide range of contents that are evaluated by academic peers by the Double-Blind method, around subjects related to the theory and practice of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy with diverse approaches and perspectives, That contribute to the diffusion of the development of Science Technology and Innovation that allow the arguments related to the decision making and influence in the formulation of international policies in the Field of Humanities and Behavioral Sciences. The editorial horizon of RINOE® extends beyond the academy and integrates other segments of research and analysis outside the scope, as long as they meet the requirements of rigorous argumentative and scientific, as well as addressing issues of general and current interest of the International Scientific Society.

## **Editorial Board**

BOJÓRQUEZ - MORALES, Gonzalo. PhD  
Universidad de Colima

ARELLANEZ - HERNÁNDEZ, Jorge Luis. PhD  
Universidad Nacional Autónoma de México

MERCADO - IBARRA, Santa Magdalena. PhD  
Universidad de Barcelona

MOLAR - OROZCO, María Eugenia. PhD  
Universidad Politécnica de Catalunya

HERNANDEZ-PADILLA, Juan Alberto. PhD  
Universidad de Oviedo

OROZCO - RAMIREZ, Luz Adriana. PhD  
Universidad de Sevilla

SANTOYO, Carlos. PhD  
Universidad Nacional Autónoma de México

GARCIA, Silvia. PhD  
Universidad Agraria del Ecuador

MONTERO - PANTOJA, Carlos. PhD  
Universidad de Valladolid

MARTINEZ - LICONA, José Francisco. PhD  
University of Lehman College

## **Arbitration Committee**

ROMÁN - KALISCH, Manuel Arturo. PhD  
Universidad Nacional Autónoma de México

GARCÍA - Y BARRAGÁN, Luis Felipe. PhD  
Universidad Nacional Autónoma de México

VILLALOBOS - ALONZO, María de los Ángeles. PhD  
Universidad Popular Autónoma del Estado de Puebla

PADILLA - CASTRO, Laura. PhD  
Universidad Autónoma del Estado de Morelos

LINDOR, Moïse. PhD  
El Colegio de Tlaxcala

CORTÉS, María de Lourdes Andrea. PhD  
Instituto Tecnológico Superior de Juan Rodríguez

BAZÁN, Rodrigo. PhD  
Universidad Autónoma del Estado de Morelos

MEDA - LARA, Rosa Martha. PhD  
Universidad de Guadalajara

FIGUEROA - DÍAZ, María Elena. PhD  
Universidad Nacional Autónoma de México

DELGADO - CAMPOS, Genaro Javier. PhD  
Universidad Nacional Autónoma de México

CHAVEZ - GONZALEZ, Guadalupe. PhD  
Universidad Autónoma de Nuevo León

## **Assignment of Rights**

The sending of an Article to RINOE Journal-Urban-Rural and Regional Economy emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Originality Format for its Article.

The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® In its Holding Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.

## **Declaration of Authorship**

Indicate the Name of Author and Coauthors at most in the participation of the Article and indicate in extensive the Institutional Affiliation indicating the Department.

Identify the Name of Author and Coauthors at most with the CVU Scholarship Number-PNPC or SNI-CONACYT- Indicating the Researcher Level and their Google Scholar Profile to verify their Citation Level and H index.

Identify the Name of Author and Coauthors at most in the Science and Technology Profiles widely accepted by the International Scientific Community ORC ID - Researcher ID Thomson - arXiv Author ID - PubMed Author ID - Open ID respectively.

Indicate the contact for correspondence to the Author (Mail and Telephone) and indicate the Researcher who contributes as the first Author of the Article.

## **Plagiarism Detection**

All Articles will be tested by plagiarism software PLAGSCAN if a plagiarism level is detected Positive will not be sent to arbitration and will be rescinded of the reception of the Article notifying the Authors responsible, claiming that academic plagiarism is criminalized in the Penal Code.

## **Arbitration Process**

All Articles will be evaluated by academic peers by the Double Blind method, the Arbitration Approval is a requirement for the Editorial Board to make a final decision that will be final in all cases. MARVID® is a derivative brand of ECORFAN® specialized in providing the expert evaluators all of them with Doctorate degree and distinction of International Researchers in the respective Councils of Science and Technology the counterpart of CONACYT for the chapters of America-Europe-Asia- Africa and Oceania. The identification of the authorship should only appear on a first removable page, in order to ensure that the Arbitration process is anonymous and covers the following stages: Identification of the Journal with its author occupation rate - Identification of Authors and Coauthors - Detection of plagiarism PLAGSCAN - Review of Formats of Authorization and Originality-Allocation to the Editorial Board-Allocation of the pair of Expert Arbitrators-Notification of Arbitration -Declaration of observations to the Author-Verification of Article Modified for Editing-Publication.

## **Instructions for Scientific, Technological and Innovation Publication**

### **Knowledge Area**

The works must be unpublished and refer to topics of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy and other topics related to Humanities and Behavioral Sciences.

## **Presentation of the Content**

In the first chapter we present, *Control Self-Assessment (CSA) as a technology risk management tool*, by LÓPEZ, Alma, with adscription in the, Universidad Iberoamericana, as the following article we present, *Use and management of cacti in the Serranía del Iñao National Park and Integrated Management Natural Area (PN-ANMI)*, by HUAYLLA, Luis, ORIAS-SOLIZ, Jorge and SALVATIERRA, Celmi, with adscription in the, Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca, as the following article we present, *Obtaining citrus fruit essences through the use of home techniques in the town of Villa Serrano*, by TORRICO, Silvia, NOYA, Daniela, BENAVIDES, Licett and FLORES, Walter, with adscription in the Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca, as the last article we present, *Richness and abundance of birds in different altitude gradients of a landscape of the Pomanasa community, municipality of Poroma, Chuquisaca*, by HUAYTA, Piter, ALVIS, Noemi and HUAYLLA, Luis, with adscription in the Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca.

## Content

<b>Article</b>	<b>Page</b>
<b>Control Self-Assessment (CSA) as a technology risk management tool</b> LÓPEZ, Alma <i>Universidad Iberoamericana</i>	1-6
<b>Use and management of cacti in the Serranía del Iñao National Park and Integrated Management Natural Area (PN-ANMI)</b> HUAYLLA, Luis, ORIAS-SOLIZ, Jorge and SALVATIERRA, Celmi <i>Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca</i>	7-13
<b>Obtaining citrus fruit essences through the use of home techniques in the town of Villa Serrano</b> TORRICO, Silvia, NOYA, Daniela, BENAVIDES, Licett and FLORES, Walter <i>Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca</i>	14-19
<b>Richness and abundance of birds in different altitude gradients of a landscape of the Pomanasa community, municipality of Poroma, Chuquisaca</b> HUAYTA, Piter, ALVIS, Noemi and HUAYLLA, Luis <i>Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca</i>	20-27



## Control Self-Assessment (CSA) as a technology risk management tool

## Control Self-Assessment (CSA) como herramienta de gestión de riesgo tecnológico

LÓPEZ, Alma†

*Universidad Iberoamericana, Prolongación Paseo de la Reforma 880, Alvaro Obregon, Lomas De Santa Fe, 01219, Mexico City, Mexico*

ID 1<sup>st</sup> Author: *López, Alma*

DOI: 10.35429/JURRE.2021.8.5.1.6

Received March 11, 2021; Accepted June 30, 2021

---

### Abstract

The aim of this paper is to describe how the methodology of risk assessment Self-Control (CFS for short) can assist organizations as a tool for risk management, both for business processes such as for specific processes, as if they are information. For Technologies above we can conclude that the risk assessment Self-control is a methodology that can support organizations in improving risk management, implementation of controls and continuous improvement, creating value and supporting the achievement of business objectives.

### Resumen

El objetivo de este trabajo es describir cómo la metodología de evaluación de riesgos de autocontrol (CFS para abreviar) puede ayudar a las organizaciones como una herramienta para la gestión de riesgos, tanto para los procesos de negocio como para los procesos específicos, como si se trata de información. Para las tecnologías anteriores podemos concluir que la evaluación de riesgos de autocontrol es una metodología que puede apoyar a las organizaciones en la mejora de la gestión de riesgos, la implementación de controles y la mejora continua, la creación de valor y el apoyo a la consecución de los objetivos de negocio.

---

**Citation:** LÓPEZ, Alma. Control Self-Assessment (CSA) as a technology risk management tool. Journal-Urban-Rural and Regional Economy. 2021. 5-8: 1-6

---

---

† Researcher contributing as first author.

## Introduction

Control self-assessment (CSA) (Tovar, 2014) is a process through which the effectiveness of internal control is examined and evaluated with the objective of providing reasonable assurance that all business objectives will be achieved. Such methodology can be used by senior executives, auditors and even stakeholders to assess the reasonableness of risk management processes and controls in an organization.

Organizations that use self-assessment (CSA) will have a formal and documented process that will allow senior management and different work teams, and even stakeholders to participate internally in a structured way in order to:

- Identify risk factors and relevant exposures.
- Evaluate the control processes that mitigate or manage those risks.
- Develop action plans to reduce risks to manageable levels.
- Determine the probability that the business objectives will be achieved. (Tovar, 2014)

Self-assessment (CSA) promotes the evaluation of risks and controls by the staff operating the business processes, which is a significant departure from traditional methods of risk and control assessment, as it is based on the belief that the staff performing the day-to-day activities have intimate knowledge of the process, including the strengths and weaknesses in the risk and control environment. This experience provides unique insight into the implementation of controls, their intrinsic usefulness and necessary adherence. However, few companies in Mexico today have implemented control self-assessment, as it requires a certain maturity in Internal Control, which must permeate throughout the organization through the proper management of the control environment.

## Technological risk in organizations

The growing dependence on information and systems has become a critical element for the success and survival of organizations, and poor IT risk management can lead to fraud, information leakage, monetary losses, third party losses, etc.

It risks are intrinsically associated with the absence of opportunities to use technology to improve the efficiency or effectiveness of business processes or as an enabler for new organizational initiatives, that is, the risks of service delivery and IT operations are associated with all aspects of IT performance and system services, which can lead to the destruction or reduction of value for the organization. That is why it is necessary as a first step to establish a statement in every company that IT risks will always exist even if the organization does not detect or recognize them. (ISACA, 2009).

## Internal control and technology risk management

In such a globalized world, it is necessary to have control figures that support and provide top management with reasonable assurance for the achievement of objectives. That is why internal control is defined as a process carried out by the organization's Board of Directors designed to provide reasonable assurance in the achievement of objectives, focusing mainly on the following controls:

- Operational controls - Related to the effectiveness and efficiency in the use of the entity's resources.
- Financial reporting controls - Related to the preparation of reliable financial statements.
- Compliance controls - Related to the entity's compliance with applicable laws and regulations (Commission, 2004).

However, each and every one of the aforementioned controls involves Information Technology (IT) as the fundamental basis of the entire operation. Therefore, it is essential to determine which are the responsibilities in terms of control within an organization, in order to know who should take care of IT risk-control issues. Based on best practices in internal control, senior management is responsible for the supervision, establishment, administration and evaluation of risk and control management processes (Moeller, 2013). (Moeller, 2013).

Operational management is responsible for including risk assessment and controls in their business units, since IT risks also belong to the business and are associated with the use, ownership, operation, participation, influence and adoption of IT in organizations.

Since they are composed of events related to technologies, which could potentially affect the organization and the achievement of its strategic goals and objectives. (ISACA, 2009) That is why international regulations such as the Sarbanes Oxley Act (Commission, 2004), and even national regulations such as the Single Circular of the National Banking and Securities Commission, have determined technological risk and the implementation of controls to mitigate it as one of the critical points of any organization. And it is at this point where the reviewing entities (audit and/or comptroller) provide different degrees of assurance of effectiveness in terms of risk management and control processes within the organization. Likewise, it is where the application of the CSA supports the three areas of the technological risk framework, since through the self-assessment of IT processes critical and useful information can be obtained for IT governance, as well as for the identification, assessment, response and management of risk (RISK IT). (ISACA, 2014).

### **Fundamental aspects for the implementation of Control Self-Assessment (CSA)**

The implementation of the self-assessment methodology can be carried out using the following techniques:

- Workshops - where staff and management discuss the control structure, these can be control model workshops or interactive workshops.
- Surveys - where information is obtained from operating personnel regarding certain control topics that have been previously identified.

Also, in accordance with the recommendations of the Risk Management and Security Awareness Program, it is necessary to declare a policy on risk management and a security awareness program that stems from the policies, standards, guidelines and procedures for:

- Securing information assets.
- Awareness of individual duties and responsibilities in the application of their functions.

This will allow us to develop an organizational culture that promotes risk management and effective communication of those risks with stakeholders, all through a clearly documented process and continuous review by senior management. To ensure the success of the implementation of the self-assessment (CSA) the directors, stakeholders, managers and staff at all levels must be aware of and adhere to the concepts of risk and control, for this it is essential that the organization ensures the following:

- That staff understand their role and responsibility related to the organization's mission.
- Knowledge of the organization's policies, procedures and practices.
- Possess adequate knowledge of managerial, operational and technical controls.

The human factor (non-technological or procedural control factor) is key to providing an adequate and appropriate level of risk-control assessment, they are a key factor, but at the same time the weakest link, so a robust awareness program is required.

### **Frameworks and best practices that can help us in their implementation**

The implementation of best practices for IT risk management provide tangible benefits to the business, some of these are:

- Fewer unexpected events and failures.
- Increase in the quality of information.
- Increased stakeholder confidence.
- Reduced regulatory concerns.
- New business initiatives supported by innovative applications.

Some of these best practices can be found in reference frameworks and international standards such as COSO, COBIT, RISK IT, ISO 31000, in the financial sector in the framework of Basel II, among others: COSO, COBIT, RISK IT, ISO 31000, in the financial sector in the Basel II framework, among others. Although the control components are the same in these frameworks and standards, for self-assessment (CSA) and for traditional techniques, the primary difference lies in the methodology implemented to identify, review.

Evaluate and validate the controls, since in traditional techniques it is the auditor or external consultant who issues an opinion on the control framework and performs the analysis and evaluation of risks and controls based on transactions.

However, in the self-assessment process (CSA) all these activities are conducted by business unit personnel and the management in charge of each of them, based on processes, focused on the customer, oriented to risk identification, control effectiveness and process improvement (Graves, Longenecker, Marsh, & Milstead, 2003).

**Cost of the implementation of the CSA.**  
The cost of implementing Self-Control can be as low or as high as the organization decides, since it can be executed by means of simple paper surveys, up to the development of computer systems that support the application of such surveys, analysis of results, issuance of reports and notifications to senior management or process owners. In addition to this, awareness and training costs for the personnel that will direct and carry out the practice or process must be considered.

### **Benefits of the CSA.**

In its purest form the Control Self-Assessment (CSA) provides the following benefits:

- Facilitates the gathering and communication of information that leads to improved risk and control management.
- It generates value as it motivates cooperation between the different business units and increases their involvement in the design and maintenance of the risk and control management system, thus promoting a more open and shared culture within the organization.
- Business unit personnel acquire training and experience in risk assessment and risk management through the implementation of controls, improving the opportunity to achieve the organization's objectives.

- Staff are motivated by owning the risk and control management process in their business areas, which means that the corrective actions implemented by these teams are often more effective and timely.
- The entire organization's risk-controls-objectives infrastructure is subject to greater oversight and continuous improvement.
- The organizations' review bodies (audit and/or comptroller) improve their efficiency in obtaining vital and valuable information from the business units' work teams, which allows them to further investigate and perform tests to identify significant control weaknesses and high residual risks.

### **Premises for the implementation of the CFS**

One of the main premises is that if the personnel involved are not sufficiently aware of the importance of this type of practice and do not answer the surveys honestly or do not have the skills to identify risks, this can lead to a lack of certainty in the data provided by the participants. Another important premise is that if top management does not sponsor, encourage and permeate the culture of self-assessment in the organization, it is very difficult, if not impossible, to implement. In other words, a great commitment is required from top management, as well as from the personnel who will be involved in the control self-assessment process.

**Implementation Case.** In Mexico, one of the most important mortgage institutions in the country decided to implement the CSA control self-assessment practice to improve its risk-control management. The implementation method contemplated the design of the CSA control self-assessment process based on the COSO methodology for business processes and COBIT for IT processes, in which the control objectives to be achieved are defined and 8 control assessment objectives are established based on the reference framework and 5 maturity levels for each one of them.

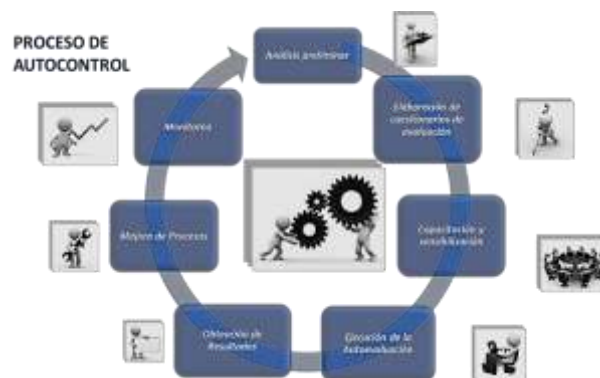


**Figure 1** Control evaluation objectives established in dimensions and 5 maturity levels based on COSO - ERM Shore: Infonavit

For this purpose, a computer system was designed to support the automation of the questionnaire application, the issuance of results reports and to facilitate the analysis of results. Workshops were also held with business owners, process owners and key personnel who operate these processes, so that they could obtain a broad representation of the perspectives that support or hinder the achievement of institutional objectives. During this phase, the Internal Comptroller's Office staff was in charge of designing and delivering the workshops, as well as managing and administering the control self-assessment process.

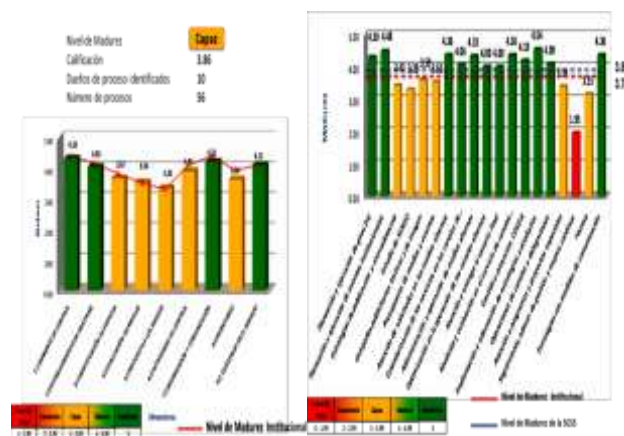
In this practice, the participants (both process owners and operators) evaluate the strengths and weaknesses of their processes (risks and controls) and comment on the impact that certain critical activities of the operation have on the achievement of institutional objectives, from a global approach to a very particular one, depending on their involvement and responsibility in the institution.

These evaluations are applied periodically using the same criteria in each exercise to facilitate accumulation and comparisons throughout the organization. Once the evaluations are carried out, a report of results is issued, in which each management receives the evaluation report, which is the basis for the exchange of ideas between management, operating personnel and the internal comptroller's office, including matters of interest for the definition of improvement actions to support institutional risk management.



**Figure 2** Self-evaluation process Shore: Infonavit

These reports compare the evaluation of the controls of each component against the maturity level of the entire institution and determine the level of confidence of the results through the validation of evidence that supported the answers of the participants, obtaining valuable information regarding potential controls, due to the specialization of each process.



**Figure 3** Comparison of results by business area and processes against institutional results corporate results Shore: Infonavit

Throughout the 3 years that the control self-assessment has been implemented, the maturity level has been raised, since in its first exercise in 2011 it obtained a maturity level of 3.71, which placed it as a CAPABLE organization in which risk management presented moderate opportunities for improvement, which placed it as a CAPABLE organization in which risk management presented moderate opportunities for improvement and over time through the implementation of improvements derived from the results and feedback from the Self-Assessments it has reached in 2015 a MATURE level with a score of 4.05.

In which the opportunities for improvement are minimal in the management of risk-control within its processes, generating value in terms of technological risk management and its business processes, since today there are standardized activities in the business processes, with documented risks and controls and operations supported by Institutional Information Systems; reflecting that both the processes and their results are quantitatively understood and controlled.

### Conclusions

The implementation of a control self-assessment system requires a certain degree of maturity on the part of the company, since lack of senior management sponsorship usually means failure in the implementation of the CSA. Such implementation facilitates the identification and management of risks in a timely and accurate manner since it is the staff who have a more finely tuned sense, who are intimately related to the operation and who know in detail what the root-causes of these risks might be, who participate in the self-assessment exercise.

The best practices or frameworks generate great value in the implementation of control self-assessment, as they can strengthen the implementation of this to the business areas that require from service delivery (ITIL), risk-control management (COBIT, ISO 31000 & RISK IT), to implications concerning the field of information security (ISO 27000). With a good sponsorship and implementation of the risk-control self-assessment (CSA), top management will have a better understanding of the risks and controls that impact the business and the financial statements; IT staff will have ownership of the control structure because they are involved in the design and evaluation of it. This will generate value in the management of the organization's business and technology risks.

### References

Commission, C.-T. C. o. S. O. o. t. T. (2004). Enterprise Risk Management. 2.

Graves, S. M., Longenecker, B., Marsh, T. L., & Milstead, H. (2003). Evaluating Internal Controls. *Government Finance Review*, 19(3), 40.

ISACA. (2009). The Risk IT Framework.

ISACA. (2014). Relating the COSO Internal Control—Integrated Framework and COBIT.

Moeller, R. R. (2013). Executive's Guide to COSO Internal Controls Understanding and Implementing the New Framework. John Wiley & Sons, Incorporated.

Tovar, F. (2014). Seminario CCSA (Certificación en Autoevaluación del Control). Instituto Mexicano de Auditores Internos A.C.

## Use and management of cacti in the Serranía del Iñao National Park and Integrated Management Natural Area (PN-ANMI)

### Uso y manejo de las cactáceas del parque nacional y área natural de manejo integrado Serranía del Iñao (PN-ANMI)

HUAYLLA, Luis†, ORIAS-SOLIZ, Jorge and SALVATIERRA, Celmi

*Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca, Facultad de Ciencias Agrarias, Calle Calvo N° 132, Sucre, Bolivia.*

ID 1<sup>st</sup> Author: *Luis, Huaylla*

ID 1<sup>st</sup> Co-author: *Jorge, Orias-Soliz*

ID 2<sup>nd</sup> Co-author: *Celmi, Salvatierra*

DOI: 10.35429/JURRE.2021.8.5.7.13

Received March 01, 2021; Accepted June 30, 2021

#### Abstract

The study was conducted to document and evaluate the use of cacti in communities of PN-ANMI Serranía del Iñao, through interviews and field trips with local informants. We identified the scientific name, common name, synonyms of the species, taxonomic description, use, and some processing practices. We documented a total of 12 cactus species belonging to 11 genera grouped in eight categories of use: construction, veterinary, food, fodder, firewood, crafts, miscellaneous, medicinal, most of these species are miscellaneous and food use. According to the gender (sex), men are the greater use to give these species (21 reports) than women that is due to direct contact with the field and some farm practices. Finally, we analyze the reduction of natural populations and management that gives these species.

**Tor catalog, Cactaceae, interview, Processing, Species**

#### Resumen

Bolivia es considerado uno de los países con mayor riqueza de familias de cactáceas, por lo que se realizó el estudio para catalogar y evaluar el uso de cactáceas en comunidades del PN-ANMI Serranía del Iñao. A través de entrevistas y recorridos de campo con informantes locales donde se registraron: nombre científico, nombre común, sinónimos de las especies, descripción taxonómica y algunas prácticas de procesamiento, se documentó un total de 12 especies de cactáceas, pertenecientes a 11 géneros agrupados en ocho categorías de uso: construcción, veterinaria, alimenticia, forrajera, leña, artesanal, miscelánea, medicinal; la mayoría de estas especies tienen uso misceláneo y alimenticio. Según el género (sexo), los hombres son los que más utilizan estas especies (21 reportes) que las mujeres, esto se debe al contacto directo con el campo y a algunas prácticas no agrícolas. Finalmente, se analizó la reducción de sus poblaciones naturales y el manejo que se le da a estas especies.

**Catálogo, Cactus, Entrevista, Tratamiento, Especies**

**Citation:** HUAYLLA, Luis, ORIAS-SOLIZ, Jorge and SALVATIERRA, Celmi. Use and management of cacti in the Serranía del Iñao National Park and Integrated Management Natural Area (PN-ANMI). Journal-Urban-Rural and Regional Economy. 2021. 5-8: 7-13

† Researcher contributing as first author.

## Introduction

### Background

Bolivia, after Mexico, is considered the country with the greatest diversity in the cacti family. Species of this family have often been collected for commercial purposes among collectors in Europe, the United States, Germany or Japan designating different names for the same taxonomic identity (Buxbaum, 1969). On the other hand, scientific knowledge about the cacti family is very scarce, particularly for Bolivia. (Navarro, 1996).

Approximately 128 species of cacti are distributed in Bolivia (Navarro, 1996). According to López (2003) the floristic richness of the cacti family for the inter-Andean dry valleys of Bolivia is distributed from 1,500 to 3,200 m of altitude, represented in 25 genera and 121 species. Wood (2005), apparently 80 species are recorded for the inter-Andean dry valleys that only grow in Bolivia, belonging to diverse growth habits, where some are creeping, globose, shrubby, even arboreal from less than 1 cm *Blossfeldia liliputanea*, up to 15 m *Neoraimondia herzogiana*.

The Serranía del Iñaño National Park and Integrated Management Natural Area (PN-ANMI-SI), includes the municipalities of Villa Vaca Guzmán (Muyupampa), Monteagudo, Padilla and Villa Serrano, bordered to the north and east by the department of Santa Cruz, to the south with the municipality of Monteagudo and Villa Vaca Guzmán, to the west with the municipalities of Villa Serrano and Padilla. It has an approximate extension of 2630.9 km<sup>2</sup>. It is within a varied altitude range that goes from 600 to 2,800 meters above sea level, varied temperature with a minimum -10° C and maximum 32° C., with precipitations of 1000 - 1200 mm. With a relative humidity it varies between 76% in the rainy season and 55% in the dry season (SERNAP 2008).

The ethnobotanical studies carried out in the area have acquired interest and importance in recent decades due to the loss of traditional knowledge and the degradation of the forests (Carretero 2005). The importance of useful plants is reflected by the need to satisfy their needs for clothing, protection, tools and food. On the other hand, the species of the Cactaceae family are mostly reported or used as fuel, construction, traditional medicine, ceremonies, fodder and others.

## Materials and methodology

Field materials used in this research:

- GPS, (For Longitude, Latitude and height data)
- Photo camera
- Newspaper sheets
- Shear's
- Map
- Machete
- Indelible markers
- Field notebook
- Field board
- Presses

### Cabinet materials

Plant dryer for the collected species.

### Stationery

Specimens from the Herbarium of the South of Bolivia (HSB) and the Geographic Information Systems tool for the elaboration of the map (areas that were studied).

## Methodology

The study was carried out in the Serranía del Iñaño NP-ANMI, where eight communities were selected: Azero Norte, Bella Vista, Entierrillos, Iritipi, Monte Grande, Santiago de las Frias, Ticucha and Timboy Pampa See (Annex 1). Semi-structured interviews were conducted in each of the communities (Choque 2009; Orias; Felipez; Terán; 2010) see (Annex 2), where eight use categories were established as priorities; Miscellaneous, Construction, Veterinary Use, Fodder, Medicine, Firewood, Technological Use and Human Food.

The research project use and management of cacti in the PN-ANMI Serranía del Iñaño, has the purpose of inventorying, analyzing the use and management of cacti and some processing practices, based on the bibliographic review of the theses carried out in the area, we proceeded to collect information related to the issue of study. The ethnobotanical studies carried out in the area, where they interviewed 30 informants per community between men and women (Choque 2009; Orias; Felipez; Terán; 2010).



Based on the list prepared through theses, the botanical collections were carried out in two campaigns (outing to the field), based on the herborization protocol that consists of: collecting, pressing, description of the species and drying of each one of the samples of the species (a special dryer for plants is used).

Photographs were taken of each of the species (the entire plant, parts of the plant, flowers and fruits). Likewise, the taxonomic description was carried out, through consultations and review of the specialized bibliography on the subject. On the other hand, additional revisions were made within the scientific collection of the Herbarium of Southern Bolivia (HSB).

The verification of the scientific names of the species was carried out through the Missouri Botanical Garden website ([www.tropicos.org](http://www.tropicos.org)).

The data processing stage was carried out once the information was homogeneous and without errors, the analysis was carried out using Excel, through dynamic tables (a tool used for data summary and data manipulation).

For the proposal of management alternatives, an analysis was made relating to the criteria of the people interviewed, through a participatory approach with the communities.

## Results and discussion

### Results obtained

For the PN-ANMI Serranía de Iñaño, 12 species of cacti have been identified, which belong to 11 genera. Within the identification process, the description of the species is shown (List N°1). With respect to the use of the species, they are grouped into 4 graphs mentioned as follows:

Usage categories by community, usage categories by gender, number of usage reports by community, number of reports by gender.

The species *Cereus stenogonus*, *Echinopsis* sp, *Harrisia tetraacantha* and *Opuntia brasiliensis*, are widely used by the communities of the PN-IMNA Serranía del Iñaño see (Table 1).

### Listing No. 1

- Registered species of the Cactaceae family in the Serranía del Iñaño.
- *Disocactus Ramulosus* (Salm-Dyck) Kimmach
- Common Name: Penca penca female
- Synonyms: *Cereus ramulosus* Salm-Dyck

### Description: woodland plants

- Epiphytes in the jungle; They have flat stems, with serrated margins, first erect and then pendulous, without thorns.
- Pink and carmine flower.
- Use and processing practice: Forage (cacti for direct use for pig feed).
- *Rhipsalis Floccosa* Salm-Dyck ex Pfeiff.
- Common Name: Penca penca male, morel
- Synonyms: *Lepismium tucumanense* (FAC Weber) Backeb. – *Rhipsalis floccosa* subsp.
- Tucumanensis (FAC Weber) Barthlott & NP Taylor
- Description: It is a fleshy, cylindrical-suspended perennial epiphyte plant with white flowers.
- Use and processing practice: Forage (cactus for direct use for food, Pigs, Miscellaneous (clarifier
- Grinding all the green part of the plant, It is thrown into the bucket of cloudy water) Food (edible fruit)
- *Opuntia Brasiliensis* (Willd.) Haw.
- Common Name: Tunilla
- Synonyms: *Brasiliopuntia brasiliensis* (Willd.) A. Berger - *Cactus brasiliensis* Willd.

- Description: Tree approximately 5 m tall. Stem cylindrical and green, holding bright green branches based on flattened segments, oval and thorny. Flowers near the apex are yellow, saucer-shaped.
- Fruit, spherical, fleshy yellow, orange and has areolas equipped with short yellow thorns.
- Use and processing practice: ornamental, miscellaneous (the cactus stalk was used as shampoo, the stalk was crushed and put in water to wash the head afterwards), food (the fruit is edible raw), Miscellaneous (clarifier by grinding all the root of the plant, it is put in the cloudy water to clarify it) Medicine (for fever the root is used)
- *Harrisia Tetraacantha* (Labour.) DR Hunt
- Common Name: piskaluru
- Synonyms: *Cereus tephraacanthus* Steud. - *Roseocereustetraacanthus* (Labour.) Backeb.
- Description: Rarely arboreal shrub
- 4 – 5 m high. Succulent stem with ramification, ascending branches in the middle part. Ribs 3-6 (7 rare). hermaphroditic flowers; large, solitary, nocturnal, ephemeral, funnel-shaped, white. Fruit, fleshy, indehiscent berry, edible yellow, orange or red with good flavor. Black seeds, very wrinkled.
- Use and processing practice: Food, Miscellaneous (clarifier, the crushed trunk is used to clarify water), medicine (It is used for diarrhea, the whole plant is used, boiled and drunk).
- *Cereus Stenogonus* K. Schum.
- Common Name: Ulala, carapari
- Synonyms: *Cereus dayamii* Speg. – *Cereus roseiflorus* Speg.
- Description: Tree approximately 8 m high; Stem rounded, succulent with branching, ascending branches. Ribs from 4 to 5 and with 2 to 3 spines. Solitary white hermaphroditic flowers with numerous stamens.
- Fleshy and glabrous berry fruit.
- Processing use and practice: food, fodder, miscellaneous (clarifying agent, the stem is sliced and placed in cloudy water)
- *Echinopsis* SP. Zucc.
- Common Name: Añapanco
- Description: generally globose plants with sharp ribs and shoots at the base. Its flowers are thin and long with scales on the receptacle and with dense hairs.
- Use and processing practice: medicine (It is used for gastritis, the fruit is boiled until it is well cooked, then its water is drunk), (It is used for kidney and liver disease, the fruit is scraped in boiled water and taking ).
- *Peifera Monacanthum* (Griseb.) PV heath
- Common Name: penca penca female
- Basionyms: *Lepismium monacanthum* (Griseb.) Barthlott; *Rhipsalis monacantha* Griseb.
- Description: epiphytic plant; Quadrangular stems with branching, ascending branches.
- Ribs from 3 to 4 and with 3 to 5 spines. Solitary orange hermaphroditic flowers with numerous stamens. Fruit capsule fleshy and glabrous.
- Use and processing practice: Fodder
- *Epiphyllum Phyllanthus* (L.) Haw.
- Synonyms: *Cactus phyllanthus* L. - *Cereus phyllanthus* (L.) DC.

– Description: Erect, highly branched plants; main woody stems and terminal stems flat, thin, 3 to 8 cm wide and up to 1m long, bright green with purple margin, crenate edge without spines, nocturnal flower, thin floral tube with little presence of scales; oblong fruit, 7 to 9 cm long and 2 to 3 cm wide, long, black, numerous seeds.

– Use and processing practice: Ornamental.

– *Rhipsalis* cf. *Baccifera* (JS Muell.) Stearn

– Common Name: morel

– Synonyms: *Rhipsalis cassytha* Gaertn. - *Rhipsalis cassythavar.* Mauritanian DC.

– Description: hanging epiphytic plant, 1 to 9 long; compound areoles with one or two bristles; stems long, cylindrical, slender, 4 to 6 mm in diameter; small, greenish-white numerous flowers along young branches; spherical fruits, white or pink, 5 to 8 mm in diameter.

– Use and processing practice: fodder

– *Cleistocactus Brookeae*. Cardenas

– Common Name: Foxtail

– Synonyms: *Cleistocactus brookeae* subsp. *vulpis-cauda* (F. Ritter&Cullmann) Mottram - *Cleistocactus vulpis-cauda* F. Ritter&Cullmann

– Description: shrubby plant; areoles with numerous small spines; stems long, cylindrical, slender, 4 to 6 mm in diameter; numerous flowers along young red branches; spherical, pink fruits.

– Use and processing practice: medicine (It is for diarrhoea, the whole plant is used, boiled and taken).

– *Pereskia Sacharosa* Griseb.

– Synonyms: *Pereskia saipinensis* Cárdenas

– Description: shrubby plant or small tree

– From 2 to 5 m. or higher, the diameter of the trunk reaches 10 to 20 cm; branches green, then thicker and covered with brown bark; lanceolate leaves 3 to 12 cm long, barely succulent; areoles with 5 dark spines; clustered pink flowers.

– *Monvillea* SP.

– Common Name: Ulala

Description: highly branched plant from the base. The very thin stems can reach 2 meters in length, have up to nine more or less rounded ribs; circular areoles with spines of various shapes. Flowering, nocturnal, on the old branches. Use and processing practice: Smoking-coking burns the trunk and from the ashes *tanimbo* is made, food (the fruit is eaten raw) Description of the categories of use by the community studied

In figure 22, 8 types of categories of use have been reported, the category with the highest number of reports is for food, followed by the miscellaneous category (it is used for various things, eg, as ash, among others) and medicine. The categories with the lowest averages in the different communities were veterinary, forage, these are based on the number of reports obtained from the interviews.

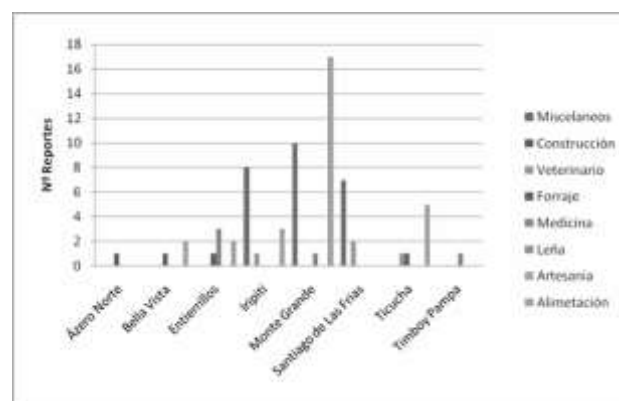
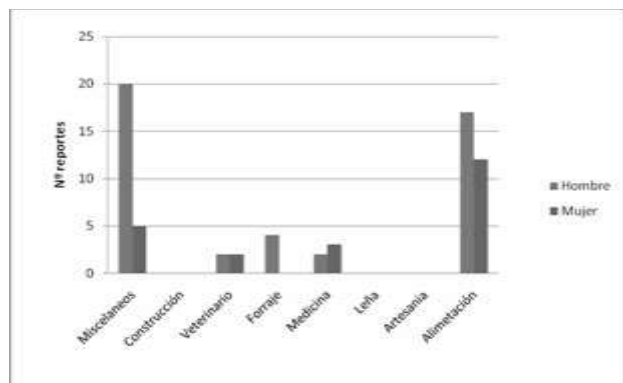


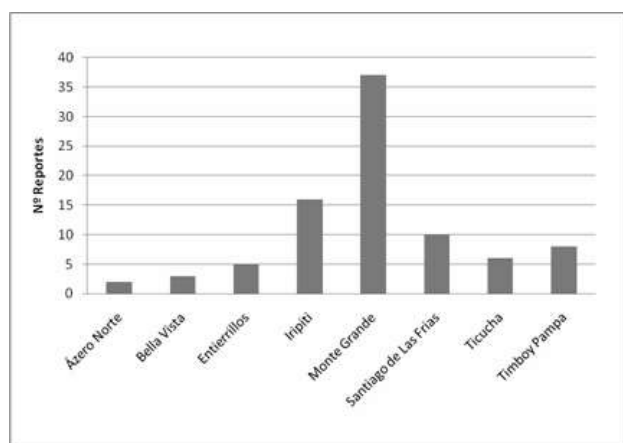
Figure 1 Usage categories by community

Figure 22.1, the difference in terms of knowledge of species by categories of use by gender, is more noticeable in the category miscellaneous and food where men reported knowing these species and women only mention 12 reports for the category food and miscellaneous 5 reports.



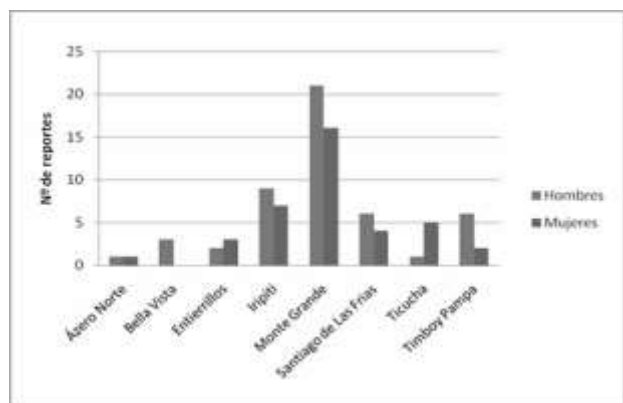
**Figure 2** Categories of use by gender

In Figure 22.2 According to the number of usage reports per community; the community of Monte Grande presents 37 reports and the community of Iritipi 16, they are the ones with a high use value; Timboy Pampa 8 and in the other communities only present 2 - 6 reports.



**Figure 3** Number of usage reports per community

In Figure 22.3, it is observed that the number of reports by gender (sex). It is the men who reported in most of the communities of the Serranía del Iñaño PN-ANMI, with the exception of the communities of Ticucha and Entierillos where women mention with an average of (5) and (3) reports.



**Figure 4** Number of reports by gender

Species	Applications	Cultural Status
<i>Cereus stenogonus</i>	1,2, 5,6	s
<i>Opuntia brasiliensis</i>	1,3,4,5	s, c
<i>Harrisia tetraacantha</i>	1,3,5	s
<i>Rhipsalis floccosa</i>	1,2,5	s
Monvilleasp.	1,5,6	s

**Table 1** Most used cacti of the PN-ANMI Serranía del Iñaño.

Uses: 1 = food; 2 = forage; 3 = medicine; 4 = ornamental; 5 = clarify the water; 6 = tuxedo. Cultural status: s = wild collected; c = cultivated.

## Discussion

Currently in the department of Chuquisaca there are no specific studies carried out on the management, use, conservation, distribution of cacti, since the disappearance of a large number of species and their habitats can have serious consequences in the conservation of genetic and biological resources. this group of plants.

According to Wood (2005), apparently 80 species are recorded for the inter-Andean dry valleys that only grow in Bolivia. According to López (2003) the floristic richness of the cacti family for the inter-Andean dry valleys of Bolivia is distributed from 1,500 to 3,200 m of altitude, represented in 25 genera and 121 species; The preliminary results obtained present 12 species belonging to 11 genera, which also demonstrates that the Serranía del Iñaño NP-ANMI located within the Bolivian-Tucuman Forest presents a wealth of genera.

## Conclusions

All the cacti species reported have one or several uses, although the most important species according to the perception of the interviewees are those that satisfy primary needs such as: food and miscellaneous. However, in some species the populations are being intervened by the extraction of species for their own use and by the expansion of the agricultural frontier.

There are species in the communities where men know and use these plants than women. This acquisition of knowledge is related to direct and indirect contact, interaction in the field or mountain and the practices of some non-agricultural activities such as: natural medicine, fruit harvest, utensil making and others, this makes knowledge about these species remain and pass from generation to generation.

Over time the use of these plants (cacti) would have to begin to be cultivated to avoid the reduction of their natural populations. For this reason, this research project was important to publicize the importance of use and some management alternatives for these species, since it is essential for the well-being of the current and future inhabitants of the area.

### Management Alternatives

- Conservation of the areas where the species were found, carrying out more specific investigations such as: population studies and monitoring to evaluate their populations.
- Select mature plants as seed generators for species propagation.
- Cultivate in situ the different species of cacti.

### Acknowledgments

The researchers thank the Science and Technology Research Department (DICYT) of the San Francisco Xavier University of Chuquisaca for the support provided in the development of this work.

### References

Arroyo, L. Steven Churchill 2009. Botanical inventories of the Bella Vista area, Santa Cruz department, Bolivia; A basis for conservation. The Editorial Rose, Santa Cruz de la Sierra, Bolivia page 143

B.Ravo, H. 1937. The cacti of Mexico. University Press, Mx. 755p.

Carretero, AL 2005. Usefulplants and traditional knowledge in the Tucumano – Boliviano forest. Master of Science Thesis, Aarhus University, Aarhus. 56 p.

Choque, M., 2009 Cultural assessment of promising native flora from the community perspective in the Bolivian-Tucuman sub-humid forest of the PNANMI-Serranía del Iñao (Luis Calvo, Chuquisaca). Bachelor's Thesis, University of San Francisco Xavier de Chuquisaca, Sucre- Bolivia.

Plant Diversity- Faculty of Exact and Natural Sciences and Surveying (UNNE) CORE EUDICOTYLEDÓNEAS page.98

Faithlizez, W., 2010. Identification and assessment of useful native plants with economic potential in the communities of Iritipi and Monte Grande of the ANMI PN-Serranía del Iñao department of Chuquisaca. Bachelor's Thesis, University of San Francisco Xavier de Chuquisaca, Sucre- Bolivia.

Guerrero, A. 2005. Population characterization of five ecologically important tree species in the Turrialba Jiménez Biological Corridor, Costa Rica. Thesis to choose Magister Scientiae. Education Program for Development and Conservation of the Tropical Agricultural Research and Teaching Center.

Hofftlan, AE 1989. Cacti in the wild flora of Chile. Ed. Fund. Claudius Gay. 14-69 p. Kvist, F. & M. Moraes R. 2006. Psychoactive Plants, pp.294-312. In: Moraes RM, B. Øllgaard,

H, Balslev, F. Borchsenius & LP Kvist (eds.) Economic Botany of the Central Andes, National Herbarium of Bolivia, Institute of Ecology, Universidad Mayor de San Andrés, Plural Editores, La Paz.

López, R. 2003. Floristic diversity and endemism of the Bolivian dry valleys, Ecology Magazine in Bolivia.

Navarro, G. 1996. Preliminary ecological catalog of cacti in Bolivia. *Lazarus* 17: 33-84. Orias, J., 2010. Current use and cultural value of useful native plants in the communities of Burials and Santiago de la Frías of the PN-ANMI Serranía del Sucre-Bolivia.

Schulze, J. 2004. Preparation of an illustrated guide to Cactaceae in Honduras. Project to opt for the title of Engineer in Socioeconomic Development and Environment in the Academic Degree of Bachelor.

Terán, H., 2010. Cultural assessment of useful wild plants in the communities of Azero Norte and Bella Vista of the PNANMI-Serranía del Iñao department of Chuquisaca. Bachelor's Thesis, University of San Francisco Xavier de Chuquisaca, Sucre-Bolivia.

Wood, Y. 2005. The “Darwin” Guide to the Flowers of the Bolivian Valleys. Mermaid, Santa Cruz- Bolivia. Internet pages : <http://mobot.mobot.org/W3T/Search/image/ima gefr.html> [www.ipni.org](http://www.ipni.org)

## Obtaining citrus fruit essences through the use of home techniques in the town of Villa Serrano

## Obtención de esencias de fruta cítrica mediante la utilización de técnicas caseras en la población de Villa Serrano

TORRICO, Silvia, NOYA, Daniela, BENAVIDES, Licett and FLORES, Walter

*Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca, Facultad de Ciencias Agrarias, Calle Calvo N° 132, Sucre, Bolivia*

ID 1<sup>st</sup> Author: *Silvia, Torrico*

ID 1<sup>st</sup> Co-author: *Daniela, Noya*

ID 2<sup>nd</sup> Co-author: *Licett, Benavides*

ID 3<sup>rd</sup> Co-author: *Walter, Flores*

DOI: 10.35429/JURRE.2021.8.5.14.19

Received March 11, 2021; Accepted June 30, 2021

### Abstract

Essences are odoriferous products that are extracted from a large number of plants by distillation. To prepare the essences of citrus, fruit selection was performed seeing that these are healthy and fresh where the juice was placed in a metal container for the distillation process by scouring through a steam extracted hose to another container. The distillate juice was mixed with sugar at 100 gr. per liter of lime juice and 300 gr. of lemon juice. In this process of getting essences at any time water is added. The product obtained was poured into a bottle cap with wide leaving the mixture in a cool place for a week, uncorking the bottle once to remove the gas that was formed by the process of maceration and packaging of essences was performed in plastic bottles with a content of 30 ml. of essential syrup. Elixirs for fruits are selected seeing that these are healthy, bucking 100g of fruit has to be removed using both the shell and the flesh of the fruit, by soaking for a period of one week in one liter of alcohol for later mix with molasses prepared above with 600 gr. sugar and a liter of water so then this is subjected to distillation and maceration.

### Elixir, Distillate, Maceration

### Resumen

Estas esencias son productos odoríferos que se extraen de un gran número de vegetales por destilación. Para la elaboración de las esencias de cítricos se realizó la selección de las frutas, viendo que fueran sanas y frescas donde se extrajo el zumo y se depositó en un recipiente metálico para el proceso de destilación arrastrando el vapor a través de una manguera hasta otro recipiente. El zumo destilado se mezcló con azúcar a razón de 100 gr. por litro de zumo de lima y 300 gr. en el de limón, en este proceso de obtención de esencias en ningún momento se añade agua. El producto obtenido se vertió en un frasco con tapa ancha, dejando la mezcla en un lugar fresco durante una semana. En el caso de la obtención de los elixires, se han seleccionado las frutas, viendo que sean sanas, se han picado 100g de fruta a extraer utilizando tanto la cáscara como la pulpa de la fruta, macerando durante un periodo de 1 semana en un litro de alcohol para que posteriormente se mezcle con una melaza previamente preparada con 600 gr. De azúcar en y litro de agua para que posteriormente se someta a destilación y maceración.

### Elixir, destilado, macerado

**Citation:** TORRICO, Silvia, NOYA, Daniela, BENAVIDES, Licett and FLORES, Walter. Obtaining citrus fruit essences through the use of home techniques in the town of Villa Serrano. Journal-Urban-Rural and Regional Economy. 2021. 5-8: 14-19

† Researcher contributing as first author.

## Introduction

Essences are odoriferous products that are extracted from a large number of vegetables. This essence is the synthesized substance obtained from an infusion. Any perfume, when inspired, produces an instant alchemical effect and each one of the aromas can influence the subtle worlds in different ways. These aromas can be transferred through perfumes, elixirs or spirits, incense, incense, etc.

The essences are extracted from the tissues of the plant organs by various physical and chemical procedures depending on the quantity and stability of the compound to be obtained. The extraction process of the products involves performing a distillation process to obtain a purer product.

The term distill comes from the Latin word "destillare" which is nothing more than the separation of a substance by means of heat, for this operation it is necessary to use an alembic but it can also be extracted in a rustic artisanal way using common kitchen tools. kitchen. Distillation is a physical process since no transformation of substances takes place, but rather a separation of some volatilizable components. From the point of view of physics, distillation is defined as follows: many substances with a very high boiling point, heated together with water pass to the vapor state at its boiling temperature, they are therefore volatile with water vapor and can be obtained and purified by current distillation of that vapour.

The essences extracted by this method of distillation, is the flavoring liquid of some vegetable in a high concentration (the percentage of concentration varies, depending on the amount of distillate, from 15 to 30%) a few drops of this substance is enough to flavor some prepared or that an environment is perfumed. An essence can also be a good flavoring agent to be applied in aromatherapy practices, cosmetology, air fresheners, confectionery, etc. Causing a pleasant feeling to users.

## Materials and methodology

### Materials

The materials that were used for the production of the essences in a homemade way are:

Pressure cookers, Kitchen, Carafe, Hose, Washer, Wooden pallet, Bottles or glass jars Clean rags, Blender, Manual extractor, Strainer or sieve, Knife, Spoon, Glucometer, Other materials, Plastoform, Self-adhesive paper, Aluminum foil and Plastic bags.

### Supplies

**Lemon, Lime, Sugar, Alcohol and Water.**

### Methodology

The methodology that was used in the process of transforming the fruit into essences, in a homemade way, has involved the training of the processors through practical and demonstrative workshops.

The people who participated in the training were students from the fruit growing program, who supported the process of making the essences and elixirs for their presentation at the Science and Technology Innovation fair of the San Francisco Xavier University that takes place in Sucre. For the elaboration of the essences and other spirit extracts, it is necessary to use some materials, tools and supplies that can be easily obtained since they may be the ones that we commonly use every day in our food preparation for our families.

The materials used served to result in a pure liquid substance obtained by distillation. Extraction by steam dragging is the process used to obtain this essence, a volatile compound that can be dragged by means of steam.

### ELIXIRES elaboration process

The process of making and obtaining citrus fruit elixirs using traditional techniques is described below.

#### Selection of fruits

For the elaboration of the citrus fruit elixirs, the selection of the fruits was made, seeing that they are healthy and fresh so as not to have faults in the elaboration.

#### Chopped and macerated

With the help of a knife and a clean dish, 100g of fruit to be extracted have been cut into pieces using both the peel and the pulp of the fruit.

When the fruit has already been prepared, it is made to macerate for a period of 1 week in an alcoholic medium, later it is mixed with a previously prepared molasses so that it is then subjected to a high temperature and can proceed to distillation to obtain a smooth and fine product.

### **Second maceration for pregnant**

The product previously obtained by steam distillation of the fruit juice was poured into a bottle with a wide lid to leave the mixture in a cool place for a week, uncovering the bottle once to remove the gas that was formed by the maceration process.

### **Preparation of the bottles for shipping**

The bottles used to pack the already macerated distilled elixirs are recycled beer bottles that, prior to their use, underwent a sterilization process using water baths, which consists of placing the bottles in a source of hot water. This procedure helps remove impurities from the bottles.

### **Pregnant**

The filling of the elixirs was carried out with the help of a funnel, pouring the contents of the jars with the macerated distilled juices into each of the bottles. Each bottle contains a quantity of 250 ml., of elixirs.

### **Tagged**

In order for the product to have a good presentation and attract the attention of consumers, each of the bottles was labeled with the respective name of the product, as well as some indications for use and its medicinal properties.

Each label also refers to the processing entity, in this case it mentions the Medium Technical Fruit Growing program of the Sanfrancisco Xavier University of Chuquisaca.

### **Stored**

The product in its final sample was stored in a cool place, until the day of its presentation at the Fair of Technology and Scientific Innovation that takes place in the city of Sucre.

### **Process of elaboration of ESSENCES**

The process of elaboration and obtaining the essences of citrus fruit using artisanal techniques is described below.

### **Selection of fruits**

For the elaboration of the essences of citrus fruit, the selection of the fruits was made, seeing that they are healthy and fresh in order to obtain the greatest amount of juice and have no faults in the elaboration to obtain essences.

### **Fruit juice extraction**

With the help of a knife, the fruits were cut in half, in a clean source, all the split fruits were placed, which were squeezed, using a manual fruit juicer.

Subsequently, the juice that has been obtained is mixed with sugar at a rate of 100 gr. Per liter of fruit juice.

### **Distilled from fruit juice by evaporation**

The fruit juice obtained above was placed in a metal container, this being a pressure cooker. In a burner stove at low heat, the pressure cooker was heated with the juice of the fruit mixed with sugar. The broth used to heat the liquid at first is high to force the rapid heating of the medium to evaporate, when the medium begins to give off steam, this broth was reduced by half to control evaporation and obtain a better product.

The vapor of the juice formed by the effect of heating is dragged through a hose to another container. In order for the steam to reach the other containers in liquid form, a condensation process was forced by making the hose that carried the steam pass through a source with cold water, thus turning the steam into a liquid. In this process of obtaining essences through evaporation at no time is water added, as this can make the duration of the essence shorter.

### **Second maceration for pregnant**

The product previously obtained by steam distillation of the fruit juice was poured into a bottle with a wide lid to leave the mixture in a cool place for a week, uncovering the bottle once to remove the gas that was formed by the maceration process.



**Preparation of bottles for packing essences**

The bottles used to pack the essences are plastic bottles that, despite being new, underwent a sterilization process using water baths. This procedure helps remove impurities from the jars.

**Pregnant**

The packaging of the essences was carried out with the help of a small funnel, pouring the essences into each of the bottles. Each bottle contains a quantity of 30 ml., of essential syrup.

**Tagged**

As in the elixirs, so that the essences have a good presentation, each of the bottles was labeled with the respective name of the product.

**Stored**

The product in its final sample was stored in a cool place, until the day of its presentation at the Fair of Technology and Scientific Innovation that takes place in the city of Sucre.

**Recipes used for extracts**

The recipes used both in the elaboration of the Essences and the elixirs are the following:

**Essences**

Essences of two varieties of citrus fruit, lime and lemon, were prepared.

**Essence obtained from lime**

1 liter lime juice  
100g sugar.

**Steps:**

The lime juice is extracted, then the juice is mixed with the sugar. Pour the blended juice into a pressure cooker for distillate.

**Applications:**

In confectionery Flavors Liquor Store Soft drinks

**Steps:**

The lime juice is extracted, then the juice is mixed with the sugar. Pour the blended juice into a pressure cooker for distillate.

**Applications:**

Extends the conservation period in the preparation of jams In confectionery  
Flavors Liquor Store Soft Drinks

**Elixirs or medicinal drinks**

Elixirs are pharmaceutical preparations in liquid, hydro-alcoholized, sweetened form that contain some medicinal active ingredients that are consumed orally. The Elixir is the result of the carefully controlled extraction of the active ingredients that the fruits possess; working in synergy (joint work of the active ingredients), mutually enhancing their effects.

**Steps:**

- The lime is washed well.
- Grate or chop the peel of the lime.
- The lime peel is macerated in alcohol for 1 week.
- Mix the sugar in the liter of water.
- Lime alcohol is strained.
- Mix the sugar water with the lime alcohol.
- It is left to macerate for 1 week.
- If you want to consume it in a more concentrated way, the lemon alcohol is distilled.

**Applications:**

Flavoring of Alcoholic beverages and Natural Medicine.

The elixir stimulates intellectual potential and analytical reasoning. Useful in learning problems; In periods of tiredness and exhaustion; Lack of concentration and is a Tonic for all ages.

**Properties:**

This elixir contains Vitamin C. Citric acids. B-complex vitamins (B1, B2, B3, B5, B6).

## Lemon elixir

Lemon peel and pulp 8 lemons  
 Sugar 600 gr.  
 Alcohol 1 Lt.  
 Mineral water 1 Lt.

### Applications:

For those who are reserved, insecure, lacking humor, with little mental energy to make decisions and study. The elixir stimulates intellectual potential and analytical reasoning. Useful in learning problems. This elixir is antiscorbutic, astringent, powerful blood purifier, nervous relaxant, rheumatism, anti-arteriosclerotic. anticarcinogenic. Curative of tuberculosis and syphilis.

### Propretores:

This elixir contains Vitamin C. Citric acids. Potassium, Magnesium, Calcium and Phosphorus (also Sodium, Iron and Fluorine). B-complex vitamins (B1, B2, B3, B5, B6).

No.	Detail	unit	Quantity	cost unit.	cost total Bs.	Source financing	
						USFX	Own
	Materials						
1	pressure cookers	Part	1	150	150		150
2	cooker burner	freight	1	20	20		20
3	hose	meters	10	2	20		20
4	washer	Part	2	12	24		24
5	wooden pallet	Part	2	9	18		18
6	glass bottles	bottle	200	20	40		40
7	30 ml plastic bottles.	bottle	100	0.30	30		30
8	clean rags	Part	4	35	14		14
9	Extractor	Part	1	6	12		12
10	Strainer or sieve	Part	5	5	25		25
11	Knife	Part	1	10	20		20
12	spoon	dozen	1	25	25		25
13	1 liter juice	Part	2	10	20		20
	Subtotal materials				418		418
	diffusion material						
14	User information	Global	1	50	50		fifty
15	Banner	Global	1	500	500		500
16	pasted	Part	2	40	80		80
	Sub Total diffusion material				630		630
	Supplies						
15	Sugar	Kilo	2	8	16		16
16	Alcohol	liter	3	10	30		30
17	lime	hundreds	1	45	45		45
18	Lemon	unit	2	25	5		5
19	mineral water	liter	3	3	9		9
	Sub Total Inputs				105		105
	Equipment						
20	Phmeter	Part	1	1200	1240	1240	
21	Printer	Print	20	32	25		25
	Sub. Total teams				1265	1240	25
	Total				2418	1240	1178
	%				100	51	49

Table 10 Production Costs

## Results and Discussion

Through the project, it was possible to obtain 1.5 liters of lime essence as a final product using common kitchen utensils.

1 liter of lemon essence was obtained for use as a flavoring agent for domestic use.

New knowledge was formed that encourages new initiatives to develop new techniques for the extraction of juices and essential oils.

Thanks to the project, the fruit processing cabinet of the Villa Serrano Medium Technical Fruit Growing program has been strengthened by the purchase of materials and equipment.

16 third-semester students of the Intermediate technical fruit growing program trained in artisanal fruit processing.

Income was generated for the Villa Serrano Medium Technical Fruit Growing program from the marketing of processed fruit.

Products derived from citrus fruit are accepted by the consumer, thus opening a window for fruit transformation enterprises for the local market.

## Findings

The elaboration of elixirs and essences economically is a better way of generating income for families since these can be made by hand, lowering production costs.

The transformation of fruit trees is a better form of commercialization, giving it added value.

Despite the fact that the project was more demonstrative, it was possible to generate some income for the Villa Serrano Medium Technical Fruit Growing program from the commercialization of processed fruit.

Products derived from citrus fruits are well accepted by consumers for their nutritional and medicinal properties.

The essences find application in numerous industries, some examples are the following:

Cosmetic and pharmaceutical industry: used as perfumes, preservatives, flavorings, active ingredients, etc.

Food and derivative industry: as flavorings for all kinds of drinks, ice cream, cookies, candies, dairy products, etc.

Cleaning products industry: such as fragrances for soaps, detergents, disinfectants, products for hospital use, etc.

Pesticide industry: as spraying agents, insect attractants and repellents, Work experience shows that the pot should be heated until no more vapors are released, but be careful not to allow the entire content to evaporate, as it can smoke and damage the product, giving it an odor burned.

### Acknowledgments

The researchers thank the Science and Technology Research Department (DICYT) of the San Francisco Xavier University of Chuquisaca for the support provided in the development of this work..

### References

Cazares, L., Christen, M. and others (1982). Current Documentary Research Techniques. Mexico: Threshing

Elaboración de elíxires medicinales en base a especies vegetales nativas y naturalizadas|| Carrera de Agronomía T.S. 2009.

[http://www.alambiques.com/extraction\\_oils.htm](http://www.alambiques.com/extraction_oils.htm)

<http://www.alambiques.com/destilaciones.htm>

<http://labquimica.wordpress.com/2007/08/07/extraction-by-drag-with-steam/>

[http://www.ecoaldea.com/recetas/recetas\\_licores.htm](http://www.ecoaldea.com/recetas/recetas_licores.htm) <http://globedia.com/esencia-limon-radica-mayor-poder-curativo-modo-obtenerla>

<http://www.beauty-natural.com/perfumes.htm>

<http://perso.wanadoo.es/e/piponet/Paginas/Elalquimista02.htm>

R. Grosse and others (2000). Extraction of essential oil from orange cashier citrus.

.

## Richness and abundance of birds in different altitude gradients of a landscape of the Pomanasa community, municipality of Poroma, Chuquisaca

## Riqueza y abundancia de aves en diferentes gradientes altitudinales de un paisaje de la comunidad Pomanasa, Municipio de Poroma, Chuquisaca

HUAYTA, Piter†, ALVIS, Noemi and HUAYLLA, Luis

Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca, Facultad de Ciencias Agrarias, Calle Calvo N° 132, Sucre, Bolivia

ID 1<sup>st</sup> Author: *Luis Huaylla*

ID 1<sup>st</sup> Co-author: *Noemi Alvis*

ID 2<sup>nd</sup> Co-author: *Luis Huaylla*

DOI: 10.35429/JURRE.2021.8.5.20.27

Received March 11, 2021; Accepted June 27, 2021

### Abstract

It marked the richness and abundance of birds in three elevational gradients in a landscape Pomanasa community, in order to contribute to the list of birds of the department of Chuquisaca, was the lifting of geographic information to delineate the area community and to characterize the known altitudinal gradients: Lower part (PB = 1980-2190 m), Media Party (PM = 2190-2200 m) and Upper part (PA = 2200-2300 m) in each gradient was established three random sampling points for bird watching for 10 minutes with a radius of 25 meters, scored all species and the number of individuals observed. In six hours of counts made during the third week of March 2011, there were 128 individuals belonging to 26 species and one sp. unidentified birds spread over a total of 22 genera and 12 families. According to the analysis of variance ( $p < 0.05$ ) there were no significant differences in the number of species and individuals of birds in different altitudinal gradients, thereby rejecting the null hypothesis  $H_0$  ( $\alpha = 0.05$ ). The study area has an average diversity as the Shannon diversity index, calculated according to the species-time curve modified (Aguirre, 2009), the time effort and the number of samples used for this work was effective.

**B.irds, Wealth, Abundance, altitudinal gradient**

### Resumen

Se caracterizó la riqueza y abundancia de la avifauna en tres tipos de gradientes altitudinales en un paisaje de la comunidad de Pomanasa, con la finalidad de contribuir al listado de aves del departamento de Chuquisaca, se realizó el levantamiento de información geográfica para delimitar el área de la comunidad y caracterizar los gradientes altitudinales denominados: Parte baja (PB = 1980-2190 msnm), Parte media (PM = 2190-2200 msnm) y Parte alta (PA = 2200-2300 msnm), en cada gradiente se establecieron tres puntos de muestreo al azar para observar las aves durante 10 minutos con un radio de 25 metros, se registraron todas las especies y el número de individuos observados. En 6 horas de conteo realizadas durante la tercera semana de marzo de 2011, se registraron 128 individuos pertenecientes a 26 especies y una especie no identificada de aves, distribuidas en un total de 22 géneros y 12 familias. Según el análisis de la varianza con ( $p < 0,05$ ) no hubo diferencias significativas en el número de especies e individuos de aves en los diferentes gradientes de altitud, por lo que se rechaza la hipótesis nula  $H_0$  ( $\alpha = 0,05$ ).

**Aves, Riqueza, Abundancia, Gradiente altitudinal**

**Citation:** HUAYTA, Piter, ALVIS, Noemi and HUAYLLA, Luis. Richness and abundance of birds in different altitude gradients of a landscape of the Pomanasa community, municipality of Poroma, Chuquisaca. Journal-Urban-Rural and Regional Economy. 2021. 5-8: 20-27

† Researcher contributing as first author.

## Introduction

The Neotropics presents a faunal composition that gives it its own stamp and distinguishes it from other zoogeographical regions, due to the presence of ancient and exclusive or endemic lineages, as well as groups from other regions, but which characterize the current fauna of the Neotropics by their great variety, distribution and abundance (Ojasti, 2000).

In many parts of the Neotropics, original habitats are being rapidly modified by excessive logging, agriculture, and ranching. Many of the fragments of native vegetation are dominated by grasslands and sparse shrublands and land dedicated to agriculture. This transformation of the original habitat has had a negative impact on bird communities and other faunal groups, reducing the amount of the original habitat, interrupting ecological processes and modifying its composition (Dirzo & Garcia 1992, Daily et al. 2001, Ramírez, 2009).

For the particular case of birds, two major threat factors were identified, these are loss of habitat and extraction of individuals from the population. The destruction and modification of habitat become the most important cause of threat to bird species in Bolivia. This loss of habitat is determined by three activities: 1) Agriculture and advance of the agricultural frontier, 2) Logging and burning of the forest and 3) Replacement of native vegetation with exotic vegetation. The second threat factor occurs for different reasons, but the most important are: 1) extraction for pets, 2) subsistence and 3) traditional uses (MMAyA 2009).

Several studies have shown that the transformation of the original habitat towards grasslands and/or agricultural areas has negatively affected the bird community, modifying its richness, diversity composition, and reducing the population size of some species (Rápale & Morton, 1985; Kridcher & Davis, 1989; Laurance & Bierregaard, 1997; Rengifo, 1999; Ramírez 2009).

The inter-Andean dry valleys present problems of enlargement, authorization of land for cultivation and abandonment, which causes soil erosion, and the alteration of biodiversity, as is the case of the Pomanasa community, this directly influences migration of birds and on the other hand some species of birds are being captured for sale as pets (PDM, 2005-2009).

Based on the above, this research work aims to contribute to the list of the avifauna of the department of Chuquisaca so that in the future policies, conservation strategies and sustainable use can be proposed.

## Materials and Methods Study Area

The work was carried out in the community of Pomanasa, located in the department of Chuquisaca to the northwest of the city of Sucre, said community belongs to district I, central Copavillque to the Second Municipal Section Poroma of the Oropeza province (See Map 1). Geographically It is located 18° 34.717' 00" S, 65° 20.029' 00" W and at an altitude of 2041m.asl

This community has 35 community members, it has approximately 160 inhabitants, the "Pomanasa" educational unit has 110 students, 5 teachers and a director, it works from the initial level, up to 2nd secondary school, it has a boarding school of 70 students who come from neighboring communities such as Molle Ork'o, Uruguayo, AguilaOrk'o, Alto Pomanasa, Copavillque, La Q'asa, Sacabamba and others.

It has a health center, managed by a nurse, the means of communication is entel through an acquired antenna, the highest authority is the leader of the sub Contralia Pomanasa, it has a center for mothers, the main activity is agriculture followed by the cattle ranch They produce Cherimoya, Wayaba, Orange, Papaya, Pacay, Corn, Barley, Potatoes, Peanuts, command cattle, goats, sheep and others in the cattle sector. These are sources of income for the family economy of the community.

The temperature ranges between 15° - 25° and rainfall 800 – 900 mm, the height ranges between 1880 – 3220 masl The study area corresponds to the inter-Andean dry forest ecoregion, the present vegetation is dry deciduous forest with species that dominate such as Algarrobo, Chacatea, Soto, Tipa, Molle. (Ibichs, et al 2003).

## Materials

### Field materials

- GPS
- Notepad
- Fog
- Nets Map
- Digital camera
- Bird Identification Guide (2010)

### Cabinet Materials

- Stationery materials (Computer, Bon paper sheets, etc.)
- Bibliography
- Bird identification guide (from other protected areas and from Bolivia)

## Experimental design

The investigation was carried out in three altitude gradients (see Map 2), called the lower part (PB = 1980-2190 masl), the middle part (PM = 2190-2200 masl) and the upper part (PA = 2200-2300 masl). ), to avoid the influence of possible factors that affect data collection, called aligned factors (Feinsinger 2001), we worked under the following considerations: the work area corresponds to a single type of vegetation, its altitude range varies between 1980 - 2300 masl with a slope 30 to 45 incline. The study was developed in the third week of the month of March 2011, during the first days the altitudinal gradients were characterized with the help of the cumunarios and three sampling points were established in each gradient, for each sampling point 4 replications were carried out having a total of 36 response units.

The data collection was during 4 days of field work, it was evaluated twice a day between 06:00 to 10:00 am and 15:00 to 19:00 pm, to give more randomness to the data collection. The sampling effort in the altitudinal gradients was the same, so that the data taken from each gradient can be compared with each other.

## Work methodology Study phase

### Pre-field phase

In this preliminary stage, the review of secondary information (bibliographic review, magazines, internet, PDMs) of the birds has been carried out in a general and specific way and the elaboration of the research proposal.

The research question and the research design have been elaborated in the 18 steps according to (Feinsinger 2001).

### Field Phase

#### Characterization of altitude gradients

The survey of geographic information of the Pomanasa community has been carried out, with a GPS, height data and spatial positioning of the community limit were taken, in the same way the selection of the study area was carried out and the establishment of three points of random observation in each altitude gradient, their respective coordinates were taken.

#### Study of the Birds in the altitudinal gradients

The method implemented was "counting points", since it is a recommended method in monitoring programs and allows the analysis of the richness and abundance of bird species (Realphet al. 1993), in addition to being appropriate for altitude gradients by the type of slope and topography that the study site presents. This method involves recording all birds observed within a radius of 25 m. around the sampling station for 10 min. These sampling stations were places where the visibility of the environment was optimal and allowed the birds to be clearly observed.

#### Bird Wealth

Bird species richness was the total number of species recorded per elevational gradient during the study; bird species observed only on the gradients were listed on the field sheet (Annex 1). During the counts, the songs were not considered to avoid bias in the data.

#### Abundance of Birds

To compare the abundance of individuals of each bird species between the PB, PM and PA, the total number of individuals observed by species and by each gradient during the entire study period was considered. Two counts per day were made at each sampling station. The sequence of counts was random. These accounts were carried out taking into account optimal environmental conditions: clear skies, calm winds, on the other hand when bird activity is greater (06:00 to 10:00 am and 03:00 to 07:00 pm), (Vides 1985). ).

These counts were carried out with approximate intervals of 1 h, using binoculars with a magnification of 50x50 m. For the identification of birds, bibliography has been used (Flores, et al. 2010).

**Post field phase**

**Characterization of altitude gradients**

The data obtained have been transformed from Coordinates: Geographic to UTM with the GENCOORD PLUS 99 program. As a spatial reference, WGS\_1984\_UTM\_Zone\_20S has been used to manage vector and raster information. These data have been processed in the ArcGis Software 9.3 and the ArcsWAT extension. In addition to the field data, the Landasat (SRTM\_u03\_p232r073) and Aster (ASTGTM\_S19W066) Spatial Elevation Models MDE have been used.

The elaboration of Maps was carried out in the ArcView 3.2 Software, a base map of the location of the community, a map of the location of the study area within the area of the community and a characterization map of the altitudinal gradients (PB, PM and PA) in the study area and the location of the sampling points. On the other hand, we proceeded to calculate the area, perimeter of the community, the study area.

**Wealth**

The field data were tabulated in an Excel sheet to perform the corresponding analyzes on the richness in the PB, PM and PA, the analysis was used to calculate the specific Richness and the diversity of Shannon, to determine which of the gradients presents greater wealth.

**Abundance of birds**

The results were represented in a Table where the frequency of observation and the relative abundance for each species of the PB, PM and PA were shown. These data were analyzed using the Shannon diversity index, the Shannon evenness index, the dominance index and curca range abundance. On the other hand, the calculation of the species accumulation curves was carried out to determine if the time used and the number of samples plus the replicas were sufficient to carry out the work.

**Comparison between altitudinal gradients**

To compare the richness of species in the lower part (PB), middle part (PM) and upper part (PA) of the altitudinal gradients, the analysis of variance was determined, for a confidence level  $p > 0.5$ . All the statistical tests described were carried out with the statistical software InfoStat, version 2008 and Excel 2007.

**Results and Discussion**

**Results**

**Characterization of altitude gradients**

There are the geographic coordinates of the community (Table 1) and the coordinates of the sampling points (Table 2). After processing these data in the Software indicated above, we have the geographical location maps of the Pomanasa community (Map 1), map of the study area (Map 2) and characterization map of the altitude gradients (Map 3).

With the present research study, 128 individuals (Figure 2) belonging to 26 species and one sp. undetermined species of birds distributed in 22 genera and 12 families (Table 3). The greatest diversity was found in the middle part with 35.93%, followed by 33.59% corresponding to the upper part and 30.46% in the lower part (Table 1).

Family	Gender	species	Bottom			middle part			high part		
			No. ind.	dand	bound. %	N. ind.	dand	bound. %	N. ind.	dand	bound. %
Tinamidae	Nothoprocta	Pentlandii	0	0	0	0	0	0	1	2.33	
Trocapitidae	Geranoastur	Meloleucus	1	2.56	0	0	0	0	0	0.00	
Falconidae	face face	Plancus	5	12.82	0	0	0	0	0	0.00	
Columbidae	Zenaid	Auriculata	0	0.00	4	8.70	4	9.30			
	columbine	Picu	0	0.00	2	4.35	0	0.00			
	leptoti	Megaloure	4	10.26	2	4.35	0	0.00			
Psittacidae	Aratinga	Acuticaudata	8	5.1	5	10.87	0	0.00			
	Aratinga	Mitrata	4	10.26	1	2.17	2	4.65			
	Myopitta	Luchsi	0	0.00	0	0.00	12	27.91			
Trochilidae	Chlorostilbon	Mellisauis	1	2.56	2	2.17	0	0.00			
	amazilia	Chionoister	1	2.56	0	0.00	0	0.00			
	sappo	Sparganura	4	10.26	0	0.00	0	0.00			
	Patagonia	Gigs	0	0.00	0	0.00	1	2.33			
Picidae	Melanerpes	Cactorum	2	5.13	1	2.17	1	2.33			
Furnariidae	athens	Pyrrhoteuca	2	5.13	0	0.00	0	0.00			
Tyrannidae	Hemitricus	Daisyciver	2	5.13	3	6.52	2	4.65			
	Ochilthoea	Ornithoides	0	0.00	2	4.35	1	2.33			
Polioptilidae	psoroptila	chumcode	0	0.00	4	8.70	4	9.30			
tinimidae	Mimus	dorsalis	0	0.00	3	6.52	2	4.65			
Emberizinae	Phrygilus	fruticeti	2	5.13	0	0.00	0	0.00			
	Phrygilus	plain	1	2.56	0	0.00	0	0.00			
	lophospingus	griseocristatus	0	0.00	3	6.52	0	0.00			
	poospizza	Bolivian	0	0.00	3	6.52	2	4.65			
	poospizza	huacana	0	0.00	3	6.52	two	4.65			
	poospizza	melanoleuca	0	0.00	0	0.00	one	two.33			
	Sicalis	luteocephala	0	0.00	5	10.87	two	4.65			
	Sicalis	flaveola	2	5.13	0	0.00	0	0.00			
Sp.			0	0.00	4	8.70	5	7.63			
Touch			39	100.00	46	100.00	43	100.00			

**Table 17** Species richness reported for the Pomanasa community

The most abundant family in the area was Psittacidae with 32 (25%) of the total individuals in three species, followed by the Emberizinae family with 27 (21.09%) of the total individuals in eight species and Columbidae with 16 (12, 50%). ) of the total number of individuals in three species. (Table 1).

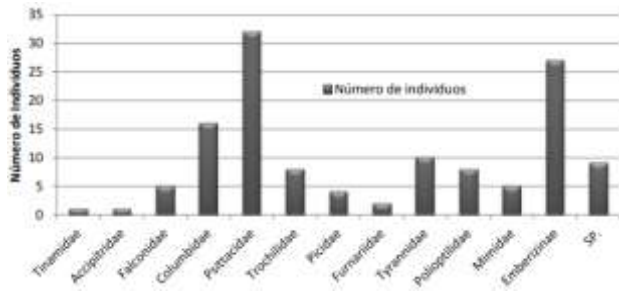


Figure 17 Number of bird individuals per family

Familia	Number of species	Number of M	Number of Singles	Number of P.B	% Ind. P.M	% Ind. PTO
Tinamidae	one	one	one	0	0,000	0,000
Accipitridae	one	one	one	0,781	0	0,000
Falconidae	one	5	5	3,906	0	0,000
Columbidae	3	16	4	3,125	8	6,250
Psittacidae	3	32	12	9,375	6	4,688
Trochilidae	3	8	6	4,688	one	0,781
Picidae	one	4	two	one,563	one	0,781
Furnariidae	one	two	two	one,563	0	0,000
Tyrannidae	two	10	two	one,563	5	3,906
polyoptilidae	one	8	0	0,000	4	3,125
mimidae	one	5	0	0,000	3	two,344
Emberizinae	8	27	5	3,906	14	10,938
Sp.	one	9	0	0,000	4	3,125
Total	27	128	39	30,469	46	35,938

Table 2 Number of bird species, frequency and relative abundance per family present in the altitude gradients PA, PM and PB

Three families were recorded only in the lower part and one family in the upper part, the common families in the PB, PM and PA were Columbidae, Psittacidae, Trochilidae, Picidae, Tyrannidae and Emberizinae (Table 15.1).

All records of bird species observed during the counts (Annex 2, 3 and 4), have been listed and compared between PB, PM and PA elevational gradients (Table 2). The greatest richness and abundance of birds occurred in the middle part as shown below (Figure 2).

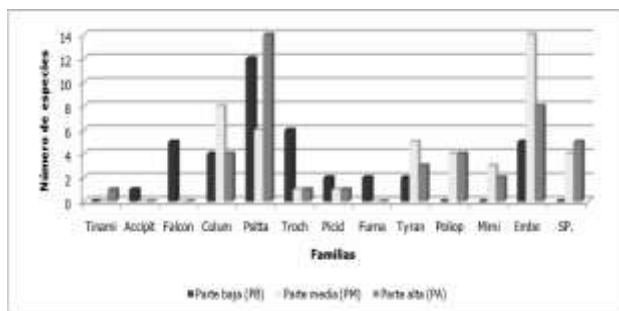


Figure 2 Number of bird species per family in altitudinal gradients

**Bird Wealth in Altitudinal Gradients**

The study area has a mean diversity according to the Shannon Diversity Index (H')= 3.0 of the 27 bird species recorded in the PB, PM and PA elevational gradients during the study period, in the Middle Part observed a greater number of species ( 16 species in total: Median= 4; Range= 8-1; ).

Than in the Upper Part (15 species in total: Median= 2.5; Range= 5-1) and in the Part Low (14 species in total: Median = 6; Range= 12-1; ) (Figure 15.1). Of these 27 species, 3 species were common in the three altitudinal gradients, while 8 species were recorded in the Lower Part, 2 species in the Middle Part and 3 species in the High Part..

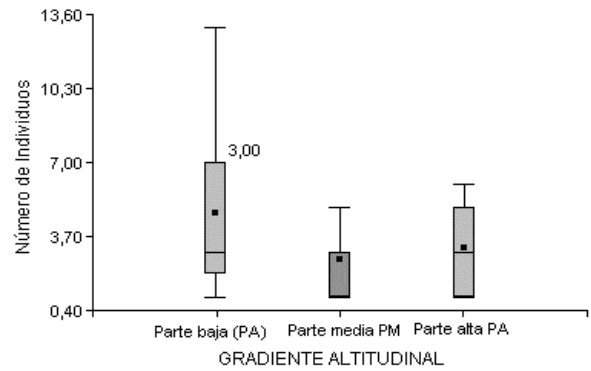


Figure 3 Box plot (Box-plot) Number of individuals in the grand altitude

**Abundance of birds in the altitudinal gradients**

Of the three species of birds that were common in the PB, PM and PA, two one species were abundant in the PB, one in the PM, two in the PA and a single species was abundant in the three gradients. One species of bird, present in PA, PM and PB, had a frequency of observation greater than two individuals. The most abundant species in the study area were Aratingaacuticaudata, Myopsittaluchsi, Zenaida auriculata, andPolioptiladumicola (Figure 3)

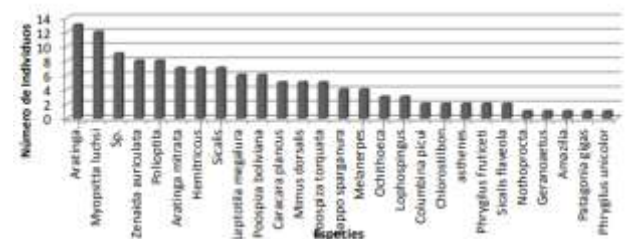


Figure 3 Range-abundance curve

**Comparison between Altitudinal Gradients**

Variable	N	E*	P*	A)	CV	
Núm. De Individuos	36	0,12	0,07	70,23		
Cuadro de Análisis de la Varianza (SC tipo III)						
F.V.	SC	gl	CM	F	p-valor	Coef
Modelo	28,39	2	14,19	2,31	0,1149	
Puntos (min.)	28,39	2	14,19	2,31	0,1149	
Grad. Altitudinal	0,00	0	0,00	sd	sd	0,00
Error	202,58	33	6,14			
Total	230,97	35				

Figure 4 Analysis of Variance: not significantly different (p<0.05)



According to the analysis of variance, there were no significant differences in the number of bird species between altitudinal gradients (Figure 17.4). of bird species between the altitudinal gradients (Figure 17.4). According to the calculations of the According to the diversity index calculations, the PM is diverse ( $H'=2.66$ ), it has a medium diversity, and it is equitable ( $\delta= 0.69$ ). equitable ( $\delta= 0.69$ ) is quite homogeneous in number of individuals, but there is more dominance in the PA ( $E=0.69$ ). PA ( $E=0.69$ ) there are species that have a greater number of individuals.

	Bottom (PB)	Middle part (PM)	High part (PA)
Number of Individuals	39	46	43
Number of species	9	9	10
Shannon Diversity Index	2.42	2.66	2.38
Simpson Dominance Index ( $\delta$ )	0.11	0.07	0.13
Shannon's Fairness Index	0.06	0.69	0.06

**Table 3** Diversity, dominance and evenness index

### Species-time curve

The accumulation curve at the landscape level, which relates the number of species with the number of sampling points in minutes (Fig. 17.5), allowed us to estimate that the time of effort and sampling sampling points in minutes (Fig. 17.5) allowed us to estimate that the effort and sampling time for the expected of the expected species in the entire landscape of the study area in the Pomanasa community was adequate adequate.

### Discussion

The calculations carried out determine that the diversity of birds at the landscape level is medium, there is not much difference in terms of the number of species and individuals, that is, if the place is homogeneous in terms of vegetation and the height range does not vary a lot. This agrees with (FLORES P., Rafael 2004) indicating that the greatest diversity of birds occurs in the forest area, which has greater structural complexity.

However, we must mention that despite the presence of human activity, there are species found in the PB, there are some species that are tolerable to human activity, unlike others that prefer to keep their distance, despite the fact that the area of study presents a single type of vegetation.

This agrees with (Lang I. et al 2003). It indicates that live fences in farming areas are important to maintain avian diversity. The usefulness of living fences can be maximized by reducing their pruning, avoiding total pruning and allowing trees to grow as much as possible to diversify the fences with more tree species.

However, the PM presents a greater diversity compared to the PB and PA, we must mention that in the PA there is greater dominance, there are species with a greater number of individuals, on the other hand, the PB is more equitable, homogeneous in species, these data agree (Rozzi R. , Armesto 1996) indicates that it could be due to the preference for open land for crops or secondary scrub.

### Conclusions

The lack of similar studies in environments similar to the one presented by the Pomanasa community makes it difficult to compare our results, so we do not know if there is a similar pattern in other median places that present similar environmental, topographical and anthropic characteristics.

Due to the variations in the field methods and analyzes adopted by researchers, it is almost impossible to compare studies in which altitude gradients are considered. The comparison would only be possible if the meaning of the variables were similar or at least within the range or close to that we take in this study.

However, we can argue that in the study area, the richness and abundance of bird species recorded in the different altitude gradients, the PM of the forests as a function of the altitude gradients, are very important in this case to conserve the diversity of birds. where there is no There is a lot of human activity compared to the PB, in addition to forming an ecotone between these two gradients, it is easier for the birds to hide in the PM where the Forest is little intervened and they are not easy to prey to be hunted or devoured.

As has been seen, the birds prefer to be in open fields, in this case in the PB to carry out their activity during the day and the PM for their refuge, the PA is also very important for species that do not tolerate the presence of people, for this reason it is It is very important to preserve the forests that have the same common characteristic to conserve and maintain the birdlife.

Riparian vegetation within a forest is very important, above all because they try to increase tree cover and are indicators of the presence of avifauna activity, many birds prefer sites like this, this type of vegetation offers many resources for birds and establishing points within these allows to determine a greater number of birds.

On the other hand, it is important to mention that automated tools such as GIS are a versatile tool with applications such as in this case to characterize altitude gradients for the study of birds, making our work easier in terms of economy and time. In this way we can accelerate many works by quantifying the study areas knowing some characteristics to carry out the field work with much more efficiency.

### Acknowledgments

The researchers thank the Science and Technology Research Department (DICYT) of the San Francisco Xavier University of Chuquisaca for the support provided in the development of this work..

### References

Aguirre, Z. 2009 guide for studies of floristic composition, diversity structure of natural vegetation editorial, place.

Arcos, inty t. Bird richness and abundance in riparian forests of different widths in the Seses miles river micro-basin, Copán, Honduras. In: rev. Biol. Trop. (int. J. Trop. Biol. Issn-0034-7744) vol. 56, no. 1 (March 2008); p. 355-369.

Arizá l., f. J. —analysis of digital elevation models (dm) generated with spot-hrv and terra-ster images. Cáceres, 2003. 229 p. Degree work (doctoral thesis). Jaen University. Department of cartographic, geodetic and photogrammetric engineering.

B. Oorges-Baños, José Cruz. Association of bird species richness and diversity and vegetation structure in a medium semi-evergreen forest in central Veracruz, Mexico. In: Mexican journal of biodiversity. Vol 77 (2006); p. 235-249.

Bissell Forest bird communities in disturbed and undisturbed areas of the La Chonta forest concession, Santa Cruz, Bolivia. Technical Document 92/2000, (June 2000).

Cardenas Giovanni. Diversity and richness of birds in different habitats of a fragmented landscape in reeds, Costa Rica. In: Agroforestry in the Americas, vol. 10, no. 39-40 (2003); p. 78-85.

Claudia E. Moreno, 2001. Methods for measuring biodiversity. M&t-manuals and sea thesis, vol. 1. Zaragoza, 84 pp.

Ergueta, p. and c. De Morales 1996 Red Book of Bolivian Vertebrates La Paz, Bolivia. flowers e. & c. Capriles, 2010 Birds of the Bolivian Andes. Peace, Bolivia.

Flords peredo, rafael. Abundance and diversity of predatory birds of pinusteocoteschi seeds. Et cham. In contrasting habitats of Veracruz, Mexico. In: Veracruz forest. Vol. 6, no. 2 (2004); p. 47-53.

Spinning, liliana. Avifauna of the eastern Chaco forest of the province of Córdoba, Argentina. In: applied ecology. Vol. 5 No. 1-2 (December 2006); p. 127-136.

Halffter, g., favila m. E. And he. Arellano. 1995 spatial distribution of three groups of Coleoptera along an altitudinal transect in the Mexican transition zone and its biogeographical implications. Elytron 9: 151-185. Bulletin of the European Association of Coleopterology.

Ibisch, pl, sg beck, b. Gerkmann & a. Carter. 2003. Ecoregions and ecosystems the wealth of Bolivia. State of knowledge and conservation. Ministry of sustainable development. Editorial fsn, Santa Cruz de la Sierra.

Lang, Ivan. Composition of the bird community in live fences of Río Frio, Costa Rica. In: Agroforestry in the Americas vol. 10 Nos. 39-40 (2003); p86-92.

Mildwow, lucas m. Bird richness and abundance in Pampean agroecosystems during the post-reproductive period. In: Neotropical Ornithology, Vol. 15 no. 1 (2004); p. 371-380.

Mackinnon, b. 2004 Manual for the development and training of bird guides. Mara Kerry, Nature Canada.

Mma ya, 2009. Red Book of Bolivian Vertebrate Wildlife. Ministry of Environment and Water, La Paz-Bolivia.

Ojasti, J. (2000). Neotropical wildlife management. F. Dallmeier (ed.). Simab series n° 5. smithsonian institution/mab program

Paracuellos Rodriguez, Mariano. Structure and conservation of bird communities in wetlands of the Iberian Southeast (Almería, Spain), 2001, degree work (doctoral thesis), University of Almería, Department of Plant Biology and Ecology.

Prometa, 2001. Study of justification for the creation of the protected area "serranías del ñaño" prefecture of the department of chuquisaca directorate of natural resources and environment danish cooperation program for the environment sector. Sucre-Bolivia.

Ramirez-Albores, J. E. Diversity of birds from natural and modified habitats in a landscape of the central depression of Chiapas, Mexico. In: rev. Biol. Trop. (int. J. Trop. Biol. Issn-0034-7744) vol. 58, no. 1 (March 2010); p. 511-528.

Ramirez-Albores, J. E. Variation in the composition of bird communities in the Montes Azules Biosphere Reserve and adjacent area, Chiapas, Mexico. In: Neotropical biota, vol. 6 No. 2 (2006); p. 19.

Reichle S., H. Justinian, R. Vines & m. Blacksmith. 2003. Birds of the Bolivian Chiquitano forest and pantanal. Fan. Santa Cruz de la Sierra. Bolivia.

Roches, Mercedes. Catch rates and diets of understory birds in the Sierra de San Javier Biological Park, Tucumán, in: hornero. Vol. 16, no. 1 (2001); p. 7-15.

Rozzi R., Armesto J. Avifauna of primary temperate forests on uninhabited islands of the Chiloé archipelago, Chile. In: Chilean magazine of natural history. Vol. 69 (1996): p. 125-139.

Salinas, letty. Diversity, abundance and conservation of birds in an agroecosystem of the Ica desert, Peru. In: Peru biol. Vol. 13, no. 3 (July 2007); p. 155-167.

Vicente g., jose l., & behm c., Virginia. 2008. Consultation, edition and special analysis with arcgis 9.2. Volume i: theory. Castilla and leon meeting. Ministry of Environment. Ecuador. P.120

Yorio, Paul. Diversity, abundance and spatio-temporal dynamics of the mixed colony of birds in Punta León, Patagonia. In: Neotropical Ornithology Vol. 5 No. 2 (1994); p. 69-77.

Zárate-ovando, Bulmara. Community structure and association of aquatic birds with the spatial heterogeneity of the Bahía Magdalena-almejas lagoon complex, Baja California Sur, Mexico. In: biol. Trop. Vol. 56, no. 1 (March 2008); p. 371-389.

Zonisig, 2000. (Agroecological and socioeconomic zoning. Department of Chuquisaca. La Paz, Bolivia.)

# Instructions for Scientific, Technological and Innovation Publication

---

**[Title in Times New Roman and Bold No. 14 in English and Spanish]**

Surname (IN UPPERCASE), Name 1<sup>st</sup> Author†\*, Surname (IN UPPERCASE), Name 1<sup>st</sup> Coauthor, Surname (IN UPPERCASE), Name 2<sup>nd</sup> Coauthor and Surname (IN UPPERCASE), Name 3<sup>rd</sup> Coauthor

*Institutional Affiliation of Author including Dependency (No.10 Times New Roman and Italic)*

International Identification of Science - Technology and Innovation

ID 1<sup>st</sup> author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1<sup>st</sup> author: (Scholar-PNPC or SNI-CONACYT) (No.10 Times New Roman)

ID 1<sup>st</sup> coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1<sup>st</sup> coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 2<sup>nd</sup> coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 2<sup>nd</sup> coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 3<sup>rd</sup> coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 3<sup>rd</sup> coauthor: (Scholar or SNI) (No.10 Times New Roman)

(Report Submission Date: Month, Day, and Year); Accepted (Insert date of Acceptance: Use Only RINOE)

---

## **Abstract (In English, 150-200 words)**

Objectives  
Methodology  
Contribution

## **Keywords (In English)**

Indicate 3 keywords in Times New Roman and Bold No. 10

## **Abstract (In Spanish, 150-200 words)**

Objectives  
Methodology  
Contribution

## **Keywords (In Spanish)**

Indicate 3 keywords in Times New Roman and Bold No. 10

---

**Citation:** Surname (IN UPPERCASE), Name 1st Author, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor. Paper Title. Journal-Urban-Rural and Regional Economy. Year 1-1: 1-11 [Times New Roman No.10]

---

---

\* Correspondence to Author (example@example.org)

† Researcher contributing as first author.

# Instructions for Scientific, Technological and Innovation Publication

## Introduction

Text in Times New Roman No.12, single space.

General explanation of the subject and explain why it is important.

What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

## Development of headings and subheadings of the article with subsequent numbers

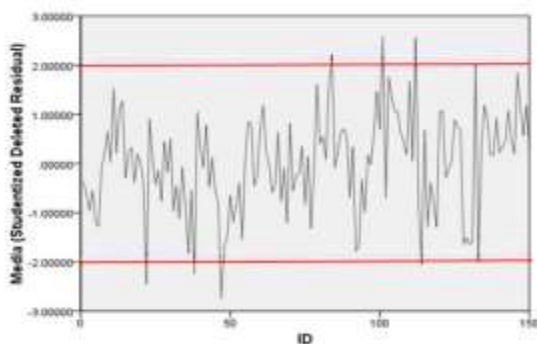
[Title No.12 in Times New Roman, single spaced and Bold]

Products in development No.12 Times New Roman, single spaced.

## Including graphs, figures and tables-Editable

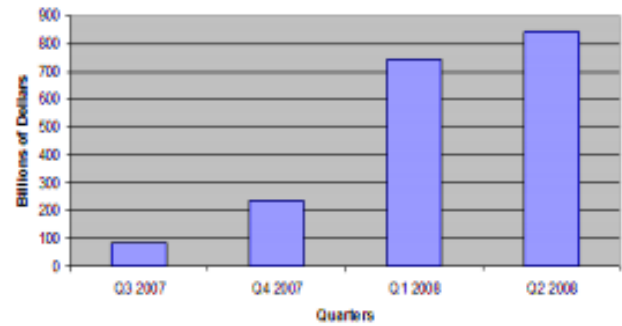
In the article content any graphic, table and figure should be editable formats that can change size, type and number of letter, for the purposes of edition, these must be high quality, not pixelated and should be noticeable even reducing image scale.

[Indicating the title at the bottom with No.10 and Times New Roman Bold]



**Graphic 1** Title and Source (in italics).

Should not be images-everything must be editable.



**Figure 1** Title and Source (in italics).

Should not be images-everything must be editable.

	CLUSTER				
	1	2	3	4	5
SOLVENCY	3.31852	-1.1404	-1.15872	0.39771	-0.25761
LIQUIDITY	0.30333	-0.22337	-0.09989	-3.44381	0.54441
SIZE	0.43530	-0.17872	-0.60025	1.22512	0.77877
PROFITABILITY	0.51014	-3.48323	0.20618	-0.1863	0.02273

**Table 1** Title and Source (in italics).

Should not be images-everything must be editable.

Each Article shall present separately in **3 folders**: a) Figures, b) Charts and c) Tables in .JPG format, indicating the number and sequential Bold Title.

## For the use of equations, noted as follows:

$$Y_{ij} = \alpha + \sum_{h=1}^r \beta_h X_{hij} + u_j + e_{ij} \quad (1)$$

They must be editable and number aligned on the right side.

## Methodology

Develop give the meaning of the variables in linear writing and important is the comparison of the used criteria.

## Results

The results shall be by section of the Article.

## Annexes

Tables and adequate sources

## Thanks

Indicate if they were financed by any institution, University or company.

# Instructions for Scientific, Technological and Innovation Publication

---

## Conclusions

Explain clearly the results and possibilities of improvement.

## References

Use APA system. Should not be numbered, nor with bullets, however if necessary numbering will be because reference or mention is made somewhere in the Article.

Use Roman Alphabet, all references you have used must be in the Roman Alphabet, even if you have quoted an Article, book in any of the official languages of the United Nations (English, French, German, Chinese, Russian, Portuguese, Italian, Spanish, Arabic), you must write the reference in Roman script and not in any of the official languages.

## Technical Specifications

Each Article must submit your dates into a Word document (.docx):

Journal Name  
Article title  
Abstract  
Keywords

Article sections, for example:

1. *Introduction*
2. *Description of the method*
3. *Analysis from the regression demand curve*
4. *Results*
5. *Thanks*
6. *Conclusions*
7. *References*

Author Name (s)  
Email Correspondence to Author  
References

## Intellectual Property Requirements for editing:

-Authentic Signature in Color of Originality Format Author and Coauthors

-Authentic Signature in Color of the Acceptance Format of Author and Coauthors

## **Reservation to Editorial Policy**

RINOE Journal-Urban-Rural and Regional Economy reserves the right to make editorial changes required to adapt the Articles to the Editorial Policy of the Journal. Once the Article is accepted in its final version, the Journal will send the author the proofs for review. RINOE® will only accept the correction of errata and errors or omissions arising from the editing process of the Journal, reserving in full the copyrights and content dissemination. No deletions, substitutions or additions that alter the formation of the Article will be accepted.

## **Code of Ethics - Good Practices and Declaration of Solution to Editorial Conflicts**

### **Declaration of Originality and unpublished character of the Article, of Authors, on the obtaining of data and interpretation of results, Acknowledgments, Conflict of interests, Assignment of rights and Distribution.**

The RINOE® Management claims to Authors of Articles that its content must be original, unpublished and of Scientific, Technological and Innovation content to be submitted for evaluation.

The Authors signing the Article must be the same that have contributed to its conception, realization and development, as well as obtaining the data, interpreting the results, drafting and reviewing it. The Corresponding Author of the proposed Article will request the form that follows.

Article title:

- The sending of an Article to RINOE Journal-Urban-Rural and Regional Economy emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Format of Originality for its Article, unless it is rejected by the Arbitration Committee, it may be withdrawn.
- None of the data presented in this article has been plagiarized or invented. The original data are clearly distinguished from those already published. And it is known of the test in PLAGSCAN if a level of plagiarism is detected Positive will not proceed to arbitrate.
- References are cited on which the information contained in the Article is based, as well as theories and data from other previously published Articles.
- The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® in its Holding Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.
- Consent has been obtained from those who have contributed unpublished data obtained through verbal or written communication, and such communication and Authorship are adequately identified.
- The Author and Co-Authors who sign this work have participated in its planning, design and execution, as well as in the interpretation of the results. They also critically reviewed the paper, approved its final version and agreed with its publication.
- No signature responsible for the work has been omitted and the criteria of Scientific Authorization are satisfied.
- The results of this Article have been interpreted objectively. Any results contrary to the point of view of those who sign are exposed and discussed in the Article.

## Copyright and Access

The publication of this Article supposes the transfer of the copyright to RINOE® in its Holding Peru for its RINOE Journal-Urban-Rural and Regional Economy, which reserves the right to distribute on the Web the published version of the Article and the making available of the Article in This format supposes for its Authors the fulfilment of what is established in the Law of Science and Technology of the United Mexican States, regarding the obligation to allow access to the results of Scientific Research.

Article Title:

Name and Surnames of the Contact Author and the Coauthors	Signature
1.	
2.	
3.	
4.	

## Principles of Ethics and Declaration of Solution to Editorial Conflicts

### Editor Responsibilities

The Publisher undertakes to guarantee the confidentiality of the evaluation process, it may not disclose to the Arbitrators the identity of the Authors, nor may it reveal the identity of the Arbitrators at any time.

The Editor assumes the responsibility to properly inform the Author of the stage of the editorial process in which the text is sent, as well as the resolutions of Double-Blind Review.

The Editor should evaluate manuscripts and their intellectual content without distinction of race, gender, sexual orientation, religious beliefs, ethnicity, nationality, or the political philosophy of the Authors.

The Editor and his editing team of RINOE® Holdings will not disclose any information about Articles submitted to anyone other than the corresponding Author.

The Editor should make fair and impartial decisions and ensure a fair Double-Blind Review.

### Responsibilities of the Editorial Board

The description of the peer review processes is made known by the Editorial Board in order that the Authors know what the evaluation criteria are and will always be willing to justify any controversy in the evaluation process. In case of Plagiarism Detection to the Article the Committee notifies the Authors for Violation to the Right of Scientific, Technological and Innovation Authorization.

### Responsibilities of the Arbitration Committee

The Arbitrators undertake to notify about any unethical conduct by the Authors and to indicate all the information that may be reason to reject the publication of the Articles. In addition, they must undertake to keep confidential information related to the Articles they evaluate.

Any manuscript received for your arbitration must be treated as confidential, should not be displayed or discussed with other experts, except with the permission of the Editor.

The Arbitrators must be conducted objectively, any personal criticism of the Author is inappropriate.

The Arbitrators must express their points of view with clarity and with valid arguments that contribute to the Scientific, Technological and Innovation of the Author.

The Arbitrators should not evaluate manuscripts in which they have conflicts of interest and have been notified to the Editor before submitting the Article for Double-Blind Review.



## **Responsibilities of the Authors**

Authors must guarantee that their articles are the product of their original work and that the data has been obtained ethically.

Authors must ensure that they have not been previously published or that they are not considered in another serial publication.

Authors must strictly follow the rules for the publication of Defined Articles by the Editorial Board.

The authors have requested that the text in all its forms be an unethical editorial behavior and is unacceptable, consequently, any manuscript that incurs in plagiarism is eliminated and not considered for publication.

Authors should cite publications that have been influential in the nature of the Article submitted to arbitration.

## **Information services**

### **Indexation - Bases and Repositories**

Research Gate (USA)

Google Scholar (Citation indices-Google)

Mendeley ((Bibliographic References Manager)

### **Publishing Services:**

Citation and Index Identification H.

Management of Originality Format and Authorization.

Testing Article with PLAGSCAN.

Article Evaluation.

Certificate of Double-Blind Review.

Article Edition.

Web layout.

Indexing and Repository

Article Translation.

Article Publication.

Certificate of Article.

Service Billing.

### **APC regulations**

The APC Publication Rate must only be made by the corresponding author, with the understanding that the Coauthors are third parties who supported the development of the article and these are included in the same rate, with the same rights and privileges of the work, as noted In the principles of Ethics and Conduct of RINOE<sup>®</sup>, supporting those who have less access to information and those emanated from the International Service of Science and Technology of the IDB, WIPO, OAS, OECD and UN.

### **Editorial Policy and Management**

1047 Avenida La Raza -Santa Ana, Cusco - Peru. Phones: +52 1 55 1260 0355, +52 1 55 6159 2296, +52 1 55 6034 9181; E-mail: [contact@rinoe.org](mailto:contact@rinoe.org) [www.rinoe.org](http://www.rinoe.org)

## **RINOE® Journal-Urban-Rural and Regional Economy**

### **Editor in chief**

BUJARI - ALLI, Ali. PhD

### **Executive director**

RAMOS-ESCAMILLA, María. PhD

### **Editorial Director**

PERALTA-CASTRO, Enrique. MSc

### **Web designer**

ESCAMILLA-BOUCHAN, Imelda. PhD

### **Web Diagrammer**

LUNA-SOTO, Vladimir. PhD

### **Editorial Assistants**

REYES-VILLO, Angélica. BsC

### **Translator**

DÍAZ-OCAMPO, Javier. BsC

### **Philologist**

RAMOS-ARANCIBIA, Alejandra. BsC

### **Advertising & Sponsorship**

(RINOE® - Peru), [sponsorships@rinoe.org](mailto:sponsorships@rinoe.org)

### **Site Licences**

03-2010-032610094200-01-For printed material, 03-2010-031613323600-01-For Electronic material,03-2010-032610105200-01-For Photographic material,03-2010-032610115700-14-For the facts Compilation,04-2010-031613323600-01-For its Web page,19502-For the Iberoamerican and Caribbean Indexation,20-281 HB9-For its indexation in Latin-American in Social Sciences and Humanities,671-For its indexing in Electronic Scientific Journals Spanish and Latin-America,7045008-For its divulgation and edition in the Ministry of Education and Culture-Spain,25409-For its repository in the Biblioteca Universitaria-Madrid,16258-For its indexing in the Dialnet,20589-For its indexing in the edited Journals in the countries of Iberian-America and the Caribbean, 15048-For the international registration of Congress and Colloquiums. [financingprograms@rinoe.org](mailto:financingprograms@rinoe.org)

### **Management Offices**

1047 Avenida La Raza -Santa Ana, Cusco - Peru.

## Journal-Urban, Rural and Regional economy

“Control Self-Assessment (CSA) as a technology risk management tool”

**LÓPEZ, Alma**

*Universidad Iberoamericana*

“Use and management of cacti in the Serranía del Iñao National Park and Integrated Management Natural Area (PN-ANMI)”

**HUAYLLA, Luis, ORIAS-SOLIZ, Jorge and SALVATIERRA, Celmi**

*Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca*

“Obtaining citrus fruit essences through the use of home techniques in the town of Villa Serrano”

**TORRICO, Silvia, NOYA, Daniela, BENAVIDES, Licett and FLORES, Walter**

*Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca*

“Richness and abundance of birds in different altitude gradients of a landscape of the Pomanasa community, municipality of Poroma, Chuquisaca”

**HUAYTA, Piter, ALVIS, Noemi and HUAYLLA, Luis**

*Mayor, Real y Pontificia Universidad de San Francisco Xavier de Chuquisaca*



ISSN 2524-2083



[www.rinoe.org](http://www.rinoe.org)