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Presentation

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In this number is presented in Section of Experimental design Quantitative analysis variables Maguey Mezcalero (A. *cupreata*) in four environments *by* BARRIOS-AYALA, Aristeo, OTERO-SÁNCHEZ, Marco Antonio, MICHEL-ACEVES, Alejandro C., ARIZA-FLORES, Rafael, *in Section of Commerce an article* Economic analysis of the pymes mexicans and the application of statistical models of optimisation for the increase of the productivity *by* VELAZQUEZ-VALADEZ, Guillermo, HUERTA-LICONA Jesús Iván and TREJO-GARCÍA José Carlos, *in Section of Options an article* Urban Solid Wastes: a non conventional resource of energy; estimation of the availability in Mexico by VALLE, Jessica and VÁZQUEZ, Edgar, *in Section of Rural an article* Program of payment for environmental services and their impact on rural women from three cultures in the state of Guerrero by OLEA, María de Jesús, SEGURA,Héctor, *in Section of Flora and fauna an article* Flora and Fauna in Federal Protected Areas of Mexico (FPAM): A sustainable vision? *by* GONZÁLEZ, Tanya, OÑATE, by NIÑO, Naú, *in Section of Agronomy an article* Aphids and disease in lemongrass (*Panicumdactylon* L.). by ESCALANTE E., Yolanda I., ESCALANTE E., J. Alberto, SAMPER E., L. Daniel, *in Section of Natural an article* Mammals of medium size and large from an area for the Conservation Voluntarily (ADVC) of Mexcaltepec, Guerrero, Mexico by GARCÍA, Isaias, PÉREZ, Rebeca, ALMAZÁN, Alberto.

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Quantitative analysis variables Maguey Mezcalero (A. *cupreata*) in four environments

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Resumen

Este trabajo se realizó con el propósito de analizar las variables cuantitativas del maguey mezcalero,*Agave cupreata*Trel& Berger, especie endémica de la cuenca del Rio Balsas de Guerrero y Michoacán, se muestrearon 100 plantas en cuatro ambientes; se usaron los descriptores requeridos en la Guía técnica para la descripción varietal de agave (*Agave spp.)*, SAGARPA-SNICS-CCVP (2014). Las localidades y/o ambientes georreferenciados fueron: Amatitlán, Axaxacualco, Chilapa y Mazatlán; se realizaron análisis de varianza entre localidades.

Contribución. El resultado fue que de las ocho variables cuantitativas medidas, siete presentan variación significativa entre ambientes.

***Agave cupreata*, Variables cuantitativas, Ambientes.**

Abstract

This work was performed in order to analyze the quantitative variables of mezcal maguey, *Agave cupreata*Trel& Berger, endemic to the Balsas River basin of Guerrero and Michoacan, 100 plants were sampled in four environments; descriptors required by the Technical Guide for the varietal description used agave (*Agave spp.*), SAGARPA-SNICS-CCVP (2014). Localities and/or georeferenced environments were: Amatitlan, Axaxacualco, Chilapa and Mazatlan; analysis of variance among localities were performed.

Contribution. The result was that of the eight measures seven quantitative variables presented significant variation between environments.

***Agave cupreata*, quantitative variables, environments.**

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Introduction

Agave cupreatapertenece the subgenus Agave, Crenatae group (Gentry, 1982). The Crenatae group is distinguished by margins crenate leaves, with varying teeth and deep and narrow panicles, but the flowers are structurally homogeneous, so the distinction of species within the group is based on leaf characters. The plants are light green to yellow-green and younger leaves are covered by a glaucous hair that is accentuated with printed patterns spines previous sheets. A. cupreata, named after a copper color of their spines, it is also distinguished by its clear, very jagged and very distinct impressions of thorns on shoots green broad leaves. Like other species of the genus in their respective habitats, A. cupreataconstituye a key to providing food and lodging to multiple organisms, especially during the dry season in which flowers and produces lots of nectar consumed by insects and birds species. This is a species that is distributed narrowly in isolated populations, forests of pine and pine / oak, and has been reported by Gentry (1982) as endemic to the Balsas River basin, in the northern state of Michoacan and the center of the state of Guerrero, between 1220 and 1800 meters.

This species has been used for centuries in the production of "mezcal", a local distilled and traditional alcoholic beverage in the state of Guerrero, whose traditional manufacturing currently represents an economical alternative to high potential for communities in this area of influence. However, as more than 90% of the raw material is of wild origin, there is little clarity and control of genotypic and phenotypic variants used, or even more, if the material used by the producers of the drink is a single taxon (Martin , et al, 2011;. Martinez, et al, 2011)..

Mature individuals in natural populations are harvested just before flowering to produce mezcal (Colunga-Garcia & Zizumbo-Villareal, 2007). The harvest prevents the reproduction of the plant, as A. cupreata is played once in its life cycle (semelparous) and not reproduced vegetatively. The effect of the crop in the demographics of populations is exacerbated because the plants need between seven and 15 years to reach sexual maturity (Illsleyet al., 2007). Therefore the aim of this paper is to analyze the variability of its quantitative descriptors for conservation, improvement and more efficient use. It is understand the variation that exists in their germplasm in terms of morphological and phenological high heritability (Hinthum van, 1995; FAO, 1996) ie characteristics whose expression is little influenced by the environment (Franco and Hidalgo, 2003, Laguna , et al., 2006)

Methodology to develop

Vegetal material. Comes from four wild populations of Agave cupreata, its geographical coordinates are: Mazatlan, MA, (17 ° 27.3 'LN 99 ° 27.5' LO), Ahuacotzintla, Chilapa, CH, (17 ° 35.8 'LN 99 ° 05.3' LO), Axaxacualco, AX, (17 ° 43.9 'LN 99 ° 25.7' LO) and Amatitlan, AM, (17 ° 51.9 'LN 99 ° 45.4' LO). These areas have a SemicálidoSemiseco climate and an altitude of 1200-1850 m, the agaves are mainly associated with trees and shrubs that make up the subtropical scrub. The soils are calcareous and contain poor levels of nitrogen, phosphorus, potassium and organic matter (Barrios et al., 2006).
Sample size. It was determined based on the statistical technique used to make inferences population values from a sample (Pita F., 1996), where:

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$$n = \frac{Z\alpha^2 * p * q}{d^2} = 96$$

n = Individuals sampled

$Z\alpha^2$ = 1.962 (sure 95 %)

p = expected proportion of variability (in this case 50% = 0.50 maximizes the sample size, if you have no idea of this data)

q = 1 – p (1-p=0.50)

d = Accuracy (in this case it is desired that the error probability is 10%).

Variables. Plant height (AP), diameter rosette (DR), number of leaves (NH), number of leaves per filotaxia (NHF) Blade Length (LH), leaf width (AH), length ratio of width sheet (RLAH) and terminal spine length (LET).

Variance analysis. This analysis was performed to quantitative variables already identified through environments (Crivisqui, 1998).

Results and discussion

The result for sample size was 96 plants, so for practical purposes we chose to use 25 plants per room to have a sample size of 100. The results of analysis of variance across locations of the eight quantitative variables and test (Tukey 0.05) are presented in Table 2 indicate that there are significant differences across locations in seven of these variables, except the length of the spinal terminal (LET) not varied. In this sense Mazzaniet al., 2007, states that the descriptors or variables of one variety or species are listed a series of characters that a priori known to have internal variability and it is preferred that most of the characters used are qualitative and easy measurement to avoid the complication that has environmental influence on quantitative characters.

In some locations the environment conducive greater growth than others (AP and DR) indicating that may be operable so as to promote increased production of biomass. Also NH, RLAH and AH, the latter varies with the environment in inverse relation to the previous two, this is that plants some rooms have more leaves, NH and RLAH but with lower AH, these variables give us an idea of the shape and / or structure of the plant and the environment influences this regard, the sampled site Mazatlan and Chilapa have similarities to these variables; so, Axaxacualco and Amatitlan tend to be larger maguey, also they appear to be more consistent in having larger plant and Chilapa presents homogeneity with smaller plants. General plants sampled in Mazatlan are heterogeneous in size and shape, Chilapa is heterogeneous in form or structure.

Anexxes

Table 1.

Gratitude

Sector Fund SAGARPA-CONACYT for funding these studies.

Conclusions

The variance analysis indicates that the environments influenced seven of the eight variables and relative to its size, is Axaxacualco Amatitlan and localities with larger maguey (AP and DR), Chilapa and Mazatlan were on average smaller. The same happened with NH, LH AH. LET unchanged.

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AMB	AP	DR	NH	NHF	LH	AH	RLAH	LET	

AM	1.1732 a	1.78600 a	60.600 ab		4.640 a	0.7452 a	0.2880 a	2.6036 a	4.744 a
AX	1.1032 a	1.71680 a	68.920 a		4.640 a	0.7148 a	0.2732 a	2.6460 a	5.028 a
CH	0.7512 c	1.29840 b	54.560 b		4.040 b	0.5316 b	0.2460 b	2.1828 b	4.528 a
MA	0.9040 b	1.67560 a	53.000 b		4.880 a	0.7020 a	0.2656 ab	2.6600 a	4.848 a
					--------				
Media	**0.9829**	**1.6192**	**59.270**		**4.550**	**0.6734**	**0.2682**	**2.5231**	**4.7870**
C.V.	**16.0373**	**19.78906**	**20.2946**		**14.7296**	**17.6918**	**13.39820**	**17.2077**	**22.0011**

Table 1 Results of analysis of variance across eight locations quantitative variables A. cupreat

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Economic analysis of the pymes mexicans and the application of statistical models of optimisation for the increase of the productivity

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Abstract

In any economy, SMEs are a key point of industrial activities, agricultural and especially the service sector. Therefore, systems of continuous improvement and productive stability of these businesses is relevant, with this objective of study in this investigation, this investigation is formulated like a time model based on a theoretical course, to analyze and check its application in a real situation and get results in order to propose a model of time improved, with a statistical fundaments, math and quality fundaments. The changes made in the practice showed positive results compared with the old model, what is important to increase the life cycle, productivity, capacity and efficient use of SMEs in México.

Gross Domestic Product (GDP), Model times, Optimization, SMEs, Applied Statistics

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† Researcher contributing first author.

Introduction

Nowadays Small and Medium Enterprises (SMEs) in Mexico are the main pillar and the key link in the national economy, thanks to the impact in job creation (72% national level), and national production (52% GDP), so, in necessary the correct environment to SME's development, profitability and stability, with the aim of having a better forecast of life, helping to national products in the country and foreign markets. Once the time life comes to SMEs, they start to be worry about their survival in many cases they need financial support, but after that the same situation will come. One way to solve this case is the use of better production techniques or process optimization. In fact, it will be able to reduce costs and increase productivity and profits. This requires trained employers to implement those improvements, because is required basic knowledge of quality management and applied statistics to made a change in technical processes.

In this work these ideas will be taken with the objective to provide a tool for improvement and optimization of processes in SMEs focused on the productive sector and services, it will be done through the method of acceptance range which is used to measure the time of a process.

With experience and fieldwork we will get an improvement of the model which will give us a better representation of the results and a simple way of analysis, but this requires at least one trained employer to the interpretation and application of that method.

Finally this tool pretend to improve SME's processes and there is the possibility of growth in order to become a stable company and exceeds the lifetime statistics survival.

Research Problem

A significant percentage of Gross Domestic Product (GDP) of our country, is generated directly by the Small and Medium Enterprises, because of they generate 77% of employment and 73% of GDP.

However, even being a vital necessity for the country, are classified within the range of high risk and most of them do not survive more than 1 year, because of the economic situation, an inadequate financial support and a wrong management according to Condusef (2011), because of a bad work line, poor organizational structures and personnel with skills and abilities necessary to achieve continuous improvements in their production processes, generating the loss of money in production.

That's way is necessary adopt the use of new technology, practices in increase capital and strategies focus on increase productivity in order to obtain efficiency and reducing operating costs, avoiding excessive increase in prices or the need fire employers, that's way is important the application of this tool, having a control that improves safe production and improving performance and utility, reducing risks and losses, trying to eliminate the causes and situations failures in processes generate improving results and obtaining greater efficiency of resources.

Therefore, the correct implementation of functions in production through technological uses, trained employers or average application in these areas, leading to a better production in; cost reduction; increased productivity and an improvement in earnings, which is a fundamental part of the production processes, continuous improvement and survival of SMEs in Mexico.

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Objective

Analyze the use of optimization statistical functions in business environment, especially in SMEs, in order to conclude if it is necessary in the production step generating a quantitative improvement in productivity.

Hypothesis

Currently Mexican companies waste resources and time in production, which is derived from not having mathematical and statistical analyzes to see the break points where processes should be improved, therefore, through a correct approach of applied mathematics is possible to obtain continuous improvements in production processes.

Economic and production theories.

For purposes of this study three theories will be considered like a vital base for the analysis of optimization statistical functions:

1. To do a detailed analysis about the situation of SMEs in Mexico is necessary the use of information that explain us the economic, productive and resource aspects around these companies, for it we will call the microeconomics theory as *"These theory which pay attention in the study of the behavior of individual agents. The object of study is generally individuals, families and businesses. What is considered as the study of the allocation of scarce resources among alternative purposes "(Federico Anzil, 2006)...*

2. At the same time, in order to have a mathematical depth with a numerical and methodological rigor to give us with a data and numbers to manipulated and then apply a quantitative improve, for it, optimization theory it will be taken as *" the process of selecting from a base of possible alternatives, the best to get the objectives*

3. *"(Marta B. Ferrero and Omar JA Chiotti, 1999).*

4. In order to obtain a relationship between mathematicians and microeconomic aspects, where its main function is to find a maximization or minimization of production variable depending on the situation, Production Theorywill be used: *"The production theory is based on the assumption that the company wants to use the minimum resources to minimize total costs to obtain a given output. So, varying the production it is possible to build relationships cost-product "(Alfredo Valle Hernandez, 2004).*

SMEs and the GDP of Mexico.

According to the Bank of Mexico, the economic growth of the nation can be measured directly by relating the value of gross domestic product (GDP) of a period, concerning previous periods. With respect to GDP is an indicator that includes the monetary value about final goods and services are sold in the country in a given period. GDP is usually regarded as the most representative for measuring a country's growth indicator because of reflects the production capacity that has the economy and the competitiveness of enterprises.

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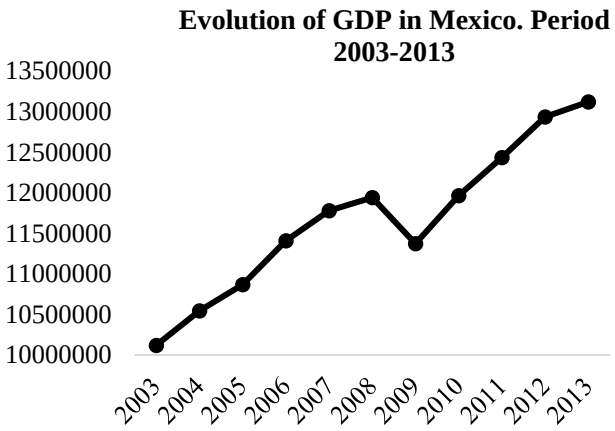


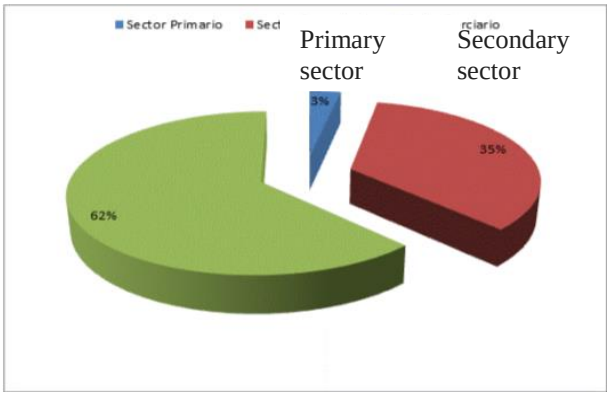
Source: Bank economic information (BIE), INEGI.

Graph 1 Evolution of GDP in Mexico. Period 2003-2013

The economic activity that reflects the GDP by activity, consists of three sectors that are segmented according to the type of activity:

1. The first sector is about agriculture activities, livestock and fisheries,
2. The second sector, pay attention in manufacturing and construction activities.
3. The third sector related to service activities and trade.

In order to analyze the economic growth by sector in Mexico (2013), we did a comparison among the three sectors to see the percentage of contribution of each sector to total GDP in the economy and know the importance everyone.



Graph 2 Percentage Share of total GDP of the Mexican economy by Economic Sector. Year 2013.

Source: Made by myself. Obtained Information by Bank Information Economic (BIE), INEGI.

The graph 3 shows that the tertiary sector is the one that has a higher percentage of participation in the country's economic growth contributing 62.3% of GDP meanwhile the secondary sector contributes 34.5% and the end is the primary sector with 3.10%.

With regard to Small and Medium Enterprises in Mexico are those having 1 to a maximum of 250 employees for its operation, Its main objective is regional development, improving the economy and creating jobs, bringing development and social cohesion, have an important role for the contribution made to the economy by generating jobs, income and supply of those niche markets not covered by the largest company in addition to boosting the productive activity of local economies.

According to the INEGI (2014) these businesses represent 99.8% of all economic units in the country representing about 77% of GDP and help to generate more than 73% of jobs in Mexico. In addition, smaller companies are preponderant in the states with the greatest lag in terms of income and have a high share of informal employment.

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Because of this, it`s essential to strengthen these businesses as part of the strategy to increase levels of productivity in the country, generate stable jobs, facilitate the transition to formality and reduce regional gaps. (National Development Financing Program 2008-2012).

Size	Sector	Range of number of employees	Range of annual sales number (MxN million)
Micro	All	Until 10	Until 4
Little	Commerce	11 to 30	4.01 to 100
	Industry and services	11 to 50	4.01 to 100
Median	Commerce	31 to 100	100.01 to 250
	Service	51 to 100	100.01 to 205
	Industry	51 to 250	

Source: www.compite.org.mx/DOFNuevaEstratificacionDeLasPyMEs.htm

Table 1 Classification of companies in Mexico, according COMPITE.

Even being a fundamental part of the economy in Mexico, SMEs tend to fail and not having a lapse of more than one year life, this is due to the economic situation insufficient funding and poor management, this factor accounts for 43 % of businesses that fail as only 2 of 10 entrepreneurs have training in administrative plus new entrepreneurs tend to centralize power.

One of the factors that must be taken into account is the problem solving and planning of production processes lack of which limits the growth of the company taking unilateral decisions without being prepared for crisis situations. In this context, 65 of 100 companies of this type that are created in a year, disappear within 2 years of life mainly due to lack of knowledge in administration and finance.

However, SMEs have positive aspects, such as: represents a large sector economic units about what refers to the total number of companies in the country, its strength in entrepreneurship and self-employment and contribution to employment, also the birth rate of these companies is high reflecting substantial growth of the number of units and thus an increase in the production of goods and services giving as resulting in increased productivity above the average established for the size of the microenterprises.

It is of utmost importance to create the administrative, scientific and technological mechanisms in order to reach the evolution and improvement of SMEs, this through using financial resources and investment in new assets, finance working, hire new staff, prospecting new markets and improvements in production, all of the above, in order to avoid premature death.

Given these challenges the following key aspects are defined:

- Increase productivity and profitability in micro and reduce the size and scope of the informal economy.
- Rebalancing the economy of SMEs to larger scales of size and facilitate the evolution of smaller to medium-sized companies.
- Improve the innovative performance of SMEs.
- Prevent further perpetuating regional economic imbalances by increasing business births and the number of existing and performance in productivity, profitability and production. OCDE (2013).

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Field study: Empresa Comercializadora de Abarrotes Metropolitana, S. A.

This is a distributor and grocery marketing Company established in 1984 in the city of Irapuato, Guanajuato, Mexico. Currently the company has a structure of more than 800 employees and presence in 85% of the Mexican Republic by establishing 6 wineries porterage, same that are spread strategically across the country, 7 distribution centers (DCs) and 14 counters.

Mission: To market consumer products of the highest quality, satisfying each of our consumers through personalized service, supplying on time and orders, always competitive prices. Also into our company, maintain a profitable operation that meets and respects the country's laws and allows the personal and professional growth of our employees and families through honest and dedicated work.

Vision: To be the leader in providing consumer products nationwide company, meeting the needs of our customers through professional management, with products and quality services, providing opportunities for development, respect and trust to our customers, employees and suppliers under a labor climate of openness and constant renewal.

Values:

- Personal: We are people who give ourselves daily activities we play, we love and respect our work because each of us is an essential link in the chain of process which we are proud.
- Productivity: As the main task of all our employees and reflected in the same way towards our customers and suppliers.
- Respect: An individuality and dignity of every employee and the ideas that drive our operation and daily activities.
- Quality: Not only in the products we sell but in all our operations and processes.
- Growth: To reach more consumers every day and never stop us in our constant struggle for development.
- Responsibility: Always bearing in mind the consequences of our actions, serving as an evaluation factor when making decisions.
- Confidence: Providing security, honesty and transparency in all our actions.
- Technology: To make increasingly dynamic, fast and reliable day our internal operation and distribution.
- Innovation: To provide new processes and benefits that meet the needs of our customers.

Mathematical model

As already noted, for purposes of testing the hypothesis statistical optimization models in order to achieve maximum benefits was taken, through decision making based on a mathematical criterion by business executives in choosing the amount of labor, capital and raw materials.

Methodology

Once assembled the elements of research: problem, objective and hypotheses; an outline of scientific research was articulated, for this purpose, a documentary search to provide information about the Gross Domestic Product (GDP) and the percentage of participation of SMEs was conducted, on the other hand the literature that refer to the models reviewed mathematics and its application in business operations, thus a theoretical framework underlying the study was formed. Research is defined as a descriptive - correlational, since looking through statistical analysis to find a correlation between the variables involved in an operating process.

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Then an optimization model under the range method of acceptance with original variables shown:

Operation	M	LM	Lm	A	Rank	M	Tc,M-1	IM	I	X

A=0.5*[|X-LM|+|X-Lm|]
Acceptance Rengo [X + A, X -A]
Where:

- M: Number of observations in the sample
- LM: higher reading
- Lm: less reading
- A: Variation
- IM: sample interval
- I: predefined interval
- X= sample mean
- Tc, M-1= Confidence level 90%

In order to adjust the model to the reality of Mexican SMEs for the category of warehousing and distribution, a change was made to the method of acceptance range, in this case, confidence coefficient 95%. This, in order to create a range of values derived from the statistical sample, possibly including the value of the unknown population mean. In this modification working with small sample sizes, a situation that allows us to apply probability T-Student.

The modification to change the order of variables for better analysis, including better statistical use It should be noted that the already modified search range that 95% of the situations occurring in production processes fall into the proposed range and therefore the decision is made more accurately.

Operation	n	$\bar{x}$	S	LCS	LC	LCI	IC 95%	I

Where:

- n= sample size
- $\bar{x}$= average sample
- S = Sample standard deviation
- LCS = Upper control limit
- LC = Central limit
- LCI = Lower Control Limit
- IC 95%= Confidence interval 95%
- I = Interval

By making these changes is necessary to use elementary statistics that allow us to develop a reliable model, the first step to carry out, is to perform two sampling:

1. the first will be preliminary (n') and provides the first approach to obtain the actual sample size we require, and
2. the second we provide the true sample size (n), which should (It is suggested that the observations are random for proper operation) used for future observations:

$$n = \left(\frac{40\sqrt{n'\sum x^2 - (\sum x)^2}}{\sum x}\right)^2$$

- n = Sample size we want to calculate (number of observations)
- n' = Number of observations of the preliminary study
- Σ = Sum of the values
- x = Value of observations.
- 40 = Constant for a confidence level of 94, 45%

Already established the number of observations and after making these samples the next step is to get the average of the sample which is obtained from the following formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Where:

- $\bar{x}$ =It is the average of the sample
- x_i= Value of observations.
- n = sample size

Then it proceeds to obtain the sample standard deviation (s), which is the standard deviation is the square root of the variance.

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That is, the square root of the mean square deviation scores. It is a statistical formula helps us to calculate reliability and provides samples.

$$s = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

Where:

- x_i=value of observations
- n = sample size
- $\bar{x}$ =It is the average of the sample
- s = sample standard deviation

Then it proceeds to calculate the specification limits, if these already exist or whether they are established in a manual they must be respected, if otherwise the following formula for obtaining them will be used, knowing that we will get the 99.38% of the data, allowing for only 0.62% error or anomalies.

- Limit oversight$\bar{x} + 2s$
- Central limit $\bar{x}$
- Limit oversight$\bar{x} - 2s$

For obtaining confidence intervals of 95%, the following formula is with n-1 degrees of freedom will apply as we are building on the Student's t distribution (tables are appended to the end of the document):

$$\bar{x} \pm t_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}} = \bar{x} \pm t_{.025} \frac{s}{\sqrt{n}}$$

Where:

- n = sample size
- $\bar{x}$ = It is the average of the sample
- s = sample standard deviation
- $t_{\frac{\alpha}{2}}$=Confidence level (in this case 95%)

If we want a change in the confidence interval must change the value of $t_{\frac{\alpha}{2}}$ that for values of 90%, 85%.

With this information you can observe the operation of the model for this study was conducted in a consumer products company and the following results were obtained:

Sampling:

In order to gather enough data for the application of mathematical model designed a sampling that covered the period from 04.07.2016 to 18.04.2016 was made, which covered a total of 93 items, which they are shown in the following table:

Process: Loading and unloading of trucks; holiday 07/04 / 2016- 18/04/2016

Date	Time/hrs	Date	Time/hrs	Date	Time/hrs	Date	Time/hrs	Date	Time/hrs
07-April	5	08-April	7	12-April	4	14-April	5	18-April	6
07-April	4	08-April	4	12-April	4	14-April	9	18-April	7
07-April	6	08-April	7	12-April	8	14-April	4	18-April	5
07-April	7	08-April	7	12-April	5	14-April	5	18-April	7
07-April	6	08-April	4	12-April	4	14-April	8	18-April	4
07-April	4	08-April	4	12-April	7	14-April	5	18-April	4
07-April	6	08-April	4	12-April	8	14-April	4	18-April	5
07-April	6	08-April	5	12-April	8	14-April	6	18-April	5
07-April	4	08-April	5	12-April	6	14-April	4	18-April	6
07-April	4	08-April	7	12-April	9	14-April	5	18-April	7
07-April	6	08-April	6	12-April	7	14-April	8	18-April	8
07-April	6	08-April	5	12-April	4	14-April	4	18-April	6
07-April	6	08-April	6	12-April	6	14-April	10	18-April	7
07-April	5	08-April	5	12-April	8	14-April	7		
07-April	3	08-April	5	12-April	6	14-April	5		
07-April	7	08-April	4	12-April	7	14-April	8		
07-April	2	08-April	7	12-April	8	14-April	5		
07-April	5	08-April	4	12-April	6	14-April	7		
07-April	8	08-April	8	12-April	6	14-April	4		
07-April	8	08-April	8	12-April	8	14-April	5		

Source: Empresa Comercializadora de Abarrotes Metropolitana, S. A.

Table 2 Data Collection Company

With the data of Table 2, the following data attached to the original method acceptance range were obtained.

M	LM	Lm	A	Range	M	Tc. M-1	IM	I	X
93	10	2	4	8	93	1.66	[2-10]	[1.8494-9.8494]	5.84946237

X-LM	4.150537634		A	4
X-lm	3.849462366		LI	1.849462366
			LS	9.849462366

Interpretation of results found:

- This model does not explain what size should be the size of research sample to be no variation, on the other hand, in order that there is no discrepancy in the results, the same formula for obtaining sample size used, although it should be clear that this should only be applied in the model range method modified acceptance.

- The upper and lower limits in this case are considered as anomalies in the sample observation these are presented only once, thereby it tends to be broad range.

- Obtaining the variation found in the total of the items taken in terms of time, it is from the mean and the limits in absolute value, this being a simple operation with little ability to represent it.

- One of the deficiencies found in this model is that from varying intervals acceptance are created, which at submit a wide range contemplates the lower limit as an acceptable abnormality and if the upper limit acceptance only It presents a minimum distance. This situation directly affects the acceptance limits in the reality of the companies, since the more data are concentrated around the mean, therefore, anomalies represent a risk for the model to be accepted as normal data.

- If it is assumed that the Student t is necessary to create confidence intervals, we found that although the model includes it does not provide clear information on its application in the same, the above based on the intervals they are provided by the difference between upper limit and lower limit.

- The way that data is fit is not optimal for analysis or understanding, this assertion is founded on the data of the sample mean (X) to be the first representative data of the observations, it is placed at the end of the table and not with the upper and lower limits, where is the value and significance of this measure of central tendency.

Range method of modified acceptance

N	x average	s	LCI	LCS	LC	IC 95%	I
93	5.84946237	1.58763042	2.67420152	9.02472321	5.84946237	[5.5224-6.1764]	[2.(

Student 95% confidence, 92 g.l	IC(-)	IC(+)
t=1.9861	5.522491506	6.17643323

Interpretation of the results found with range method of modified acceptance:

- This method allows us to apply the formula of sample size, get the information attached to the fact that the sample size should be, which will be subject to the proposed study.

- The sample standard deviation obtained with the method modified acceptance, behaves within normal standards, it means, the information are grouped around the average, which indicates that it is representative (see scatter plot).

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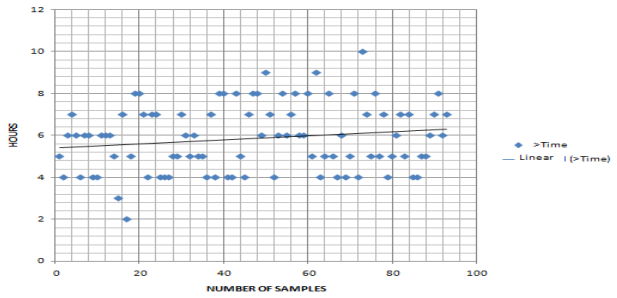

Source: Done with data from Empresa Comercializadora de Abarrotes Metropolitana, S. A.

Graphic 3 Scatter plot

- Control limits are derived from statistical formulas, to this, the sample mean ($\bar{x} \pm 2s$) and standard deviation are used, this situation encompasses most of the data considered in the sample, besides not be affected by anomalies, as included in the calculation done. Then is get the acceptance range (9.0247 2.6742) with a confidence margin of 99.2% where anomalies are excluded.

- Explains the use of the function T of Student, to obtain the confidence interval, which shows us that the average of the sample (5.84946237) is within the limits [5.5224-6.1764], this data indicate that the 95% confidence that the items are within established limits.

Comparative analysis

Upon completion of the two calculations under different methods, we proceed to a comparative analysis in order to observe their main advantages and disadvantages of each. Then the comparative is as follows:

Range method of original acceptance	Range method of modified acceptance	Observations
M= 93	N=93	The same sample size is taken to av discrepancies.
X=5.84946237	X=5.84946237	The average is the same value, sinc obtained under the same formula.
A=4	S=1.58763042	Obtaining the standard deviation is since the former is the result of a m ranking and the second by a statisti formula. It is important to note that on the range method are very dispe which reduces reliability.
Range=8	Range=null	It is considered an obsolete data, w given that the formula for the stanc deviation which is not required.
Tc. M-1= 1.66	IC 95%=[5.5224-6.1764]	The value of T Student differs becau method of range only provide it wit it a utility. Moreover, in the range n method it tells us that the confiden is 95% and that the average falls wi confidence interval, thus, is represe
IM=[2-10]	IM=null	The range is not representative for interval.
LM=10	LCS=9.02472321	The superior limit is reduced under modified method, besides indicatin item that comes out of this, is outsi operational efficiency.
Lm=2	LCI=2.67420152	The lower limit increases under the modified method, besides indicatin item that does not reach to this, is operational efficiency.
X=5.84946237	LC=5.84946237	The central limit is represented in b models as the average of the sampl
I=[1.8494-9.8494]	I=[2.6742-9.0247]	The operating range obtained unde modified method range, has more a data that allow us to deduce the eff and optimization of time, in additio excluding anomalies. With the meth original range by accepting anomali is wider, which leads companies to efficiency and profit.

Conclusions

After completing the math and literature review, the most important findings of the research are:

The hypothesis about the waste of resources in Mexican companies derived from the lack of mathematical and statistical analyzes to make decisions attached to reality checks. On this basis, the calculation of the mathematical indicator I (interval process) is that by initiating the investigation have I = [1.8494-9.8494]; with modifications based on the observations and measurement time a new interval is obtained: I = [2.6742-9.0247], which tells us precisely the range in which 99.38% of the operations of loading and unloading they must be done.

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Analyzing Table 2: "Process: Loading and unloading of trucks; period 07/04 / 2016-18/04/2016 "shows that the company Empresa Comercializadora de Abarrotes Metropolitana, S. A. makes this process a waste of time in the process studied, this is mainly because the operations are performed without any chronometer and left open how long it should take every operation, it is important to note that this is translated into economic losses to pay more time than required to achieve their goals in the process previously mentioned.

One important thing was found in the investigation is the value of the T of Students: 95% CI = [5.5224-6.1764], from which it follows that it has a confidence interval and use 95%, is say that for purposes of making other sampling have as constant value T of Students. On the other hand, it points the interval in which the average must fall to be meaningful, otherwise the average is not representative and the analysis is worthless.

According to the research, the position of Mexican Pymes should make use of statistical methods of optimization, in order to streamline their processes and reduce operating times, costs and use of equipment, also generating an increase in profits. Applying a greater number of the aforementioned methods, guarantees to companies not to resort to bank loans with high interest rates that reduces their profit margin and cuts a high percentage of the life cycle of the company.

It is important to designate that the proposed model can be applied to different areas of the company, in order to improve each company processes, this in order to solidify the position, increase its profit margin (EBITDA), it reduces the operation time and busy team, with all these benefits you have the possibility that Mexican companies cover a greater market share, generate more jobs and pay better wages.

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Urban Solid Wastes: a non conventional resource of energy; estimation of the availability in Mexico

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Resumen

Se llevó a cabo un análisis para determinar la disponibilidad de Residuos Sólidos Urbanos (RSU) en México generados en el periodo 2005-2014, con el fin de estimar el potencial energético considerando la fracción orgánica de residuos viables a una conversion anaerobia. Además, con el objetivo de realizar una comparación con los escenarios sostenibles implementados por la Organización de las Naciones Unidas (ONU) que corresponden a 17 metas enfocadas a un desarrollo sostenible y bienestar social, se estimaron los valores del potencial energético para el 2020 y 2030.

Se obtuvo que la mayor generación de RSU se encuentra en el centro del país. Se identificaron las ciudades que contribuyen con al menos 200 mil kg de RSU per cápita, teniendo a los estados de México, Ciudad de México, Guanajuato y Jalisco como los generadores más importantes, y considerando el potencial energético, junto con Veracruz, éstos se encuentran en los primeros lugares.

Los resultados de este trabajo permitieron considerar la posibilidad de utilizar los RSU como fuentes de energía alterna que permitan implementar escenarios sostenibles en México para un mayor desarrollo y bienestar social, incidiendo en acciones para la mitigación de impactos ambientales negativos.

Residuos sólidos urbanos, potencial energético, biogás.

Abstract

An analysis was performed in order to determine the availability of Urban Solid Wastes (USW) generated in Mexico during 2005-2014; it was considered the organic fraction viable for an anaerobic conversion. In addition, in order to make a comparison with sustainable scenarios implemented by the United Nations (UN) corresponding to 17 goals focused on sustainable development and social well-being, values of the energy potential were estimated for 2020 and 2030.

The Mexican central states showed the major generation of USW. The cities that contribute at least 200,000 kg of USW per capita belong to the states of Mexico, Ciudad de Mexico, Guanajuato and Jalisco; considering the potential energy, Veracruz state is included.

The results of this work allow to see the possibility for using USW as an alternative source of energy in Mexico and influence on the national development and social well-being, contributing to the mitigation of negative environmental impacts.

Urban solid wastes, energy potential, biogas, sustainability

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Introduction

Mexico is situated among the main countries generators of methane from landfills and is located in the top ten countries producers of Urban Solid Wastes (USW) worldwide (Vera, 2014).

The amount of solid wastes produced in our country increased according to the National Institute of Ecology. The national average wastes generation increased from 0.7 kg per capita per day in 1987 to 0.8 kg in 1998. In addition, the fewer generation corresponds to semi-rural or rural areas, while the bigger generation correspond to the metropolitan areas as Mexico City (INECC,2012).

During years the generated USW were piled in an open place. Both population growth and increasing consumption of manufactured goods has become impractical and irresponsible (CESOP, 2012).

According to the Mexican National Energy Balance (NBS, 2008), the primary energy production is 10,500 PJ, 89% corresponds to hydrocarbons and the rest is distributed as follows, 5.5% for primary electricity, biomass 3.3% and coal 2.2%. From the above statistics, we can deduce that the Mexican economy depends on hydrocarbons. However, various factors such as the decline in national reserves and the recent global financial crisis have motivated to use renewable energy (Romero, 2011).

Therefore, the use of USW to generate alternative energy, would generate a great impact on a country like Mexico.

There are various processes for conversion of wastes. One of them, is the production of biogas from the anaerobic fermentation of biomass, which is based on the transformation of organic matter, through a series of biochemical reactions in presence of microorganisms (Chamy, 2007).

Elango et al (2007) have reported the high potential of municipal solid wastes as feed-stock for anaerobic digestion for biogas production. The levels of organic matter produced per capita vary considerably from developed to developing countries, however, the anaerobic digestion of organic wastes is a highly feasible technology for energy production (Ofori, 2013).

On the other hand, energy scenarios provide a framework for exploring future energy perspectives, including various combinations of technology options and their implications. Many scenarios illustrate how energy system developments will affect the global issues. Some describe energy futures that are compatible with sustainable development goals, such as improved energy efficiencies and the adoption of advanced energy supply technologies. Sustainable development scenarios are also characterised by low environmental impacts and equitable allocations of resources and wealth (WEA, 2000).

In the present paper we considered an organic fraction of 53 percent of USW, according to the national characterization of residues (SEDESOL, 2004), this fraction can be converted to biogas like an alternative source of energy during 2005-2010 and the estimate for the years 2020 and 2030.

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Material and methods

Recollection of historical data

In order to calculate the energy potential of each city in Mexico it was necessary to obtain the population for each year in the lapse of study.

The information was collected from the database of the National Institute of Statics and Geography (INEGI) for 2015; the growth rate per year of the population was estimated.

It was considered a different growth rate for each State according to the study carried out by INEGI from 1990-2010.

Also, the total and projected amount of USW generation per capita was taken by National Population Council (CONAPO) analysis for 2000-2050 and it was considered that this could be linear as population growth. The generation is given as kg/hab/day.

Estimation of energy potential of USW

This estimation was made considering the availability of USW.

It was considered the per capita generation values reported by CONAPO (2003), only the organic fraction was considered.

The energy potential of the USW (EPUSW) was estimated by employing equation 1 (EPA,1996).

$$\mathrm{EPUSW} = \mathrm{CB} * (0.10\frac{\mathrm{cf}}{\mathrm{lb}} * 2000\frac{\mathrm{lb}}{\mathrm{Ton}}) * (500\ \frac{\mathrm{BTU}}{\mathrm{cf}}) * (1/(12{,}000\frac{\mathrm{BTU}}{\mathrm{kWh}})) * (\frac{1\ \mathrm{día}}{24\ \mathrm{h}}) \quad (1)$$

Where

EPUSW= Energy Potential of Urban Solid Wastes (kW)
CB= Urban solid wastes generated per day (Ton)

Results

Estimation of the energy potential

Figure 1 shows the average over the 10 years of the energy potential for each state.

In this case it is possible to observe that Edo. de México, Ciudad de México and Veracruz are the most important states with respect to generation of energy.

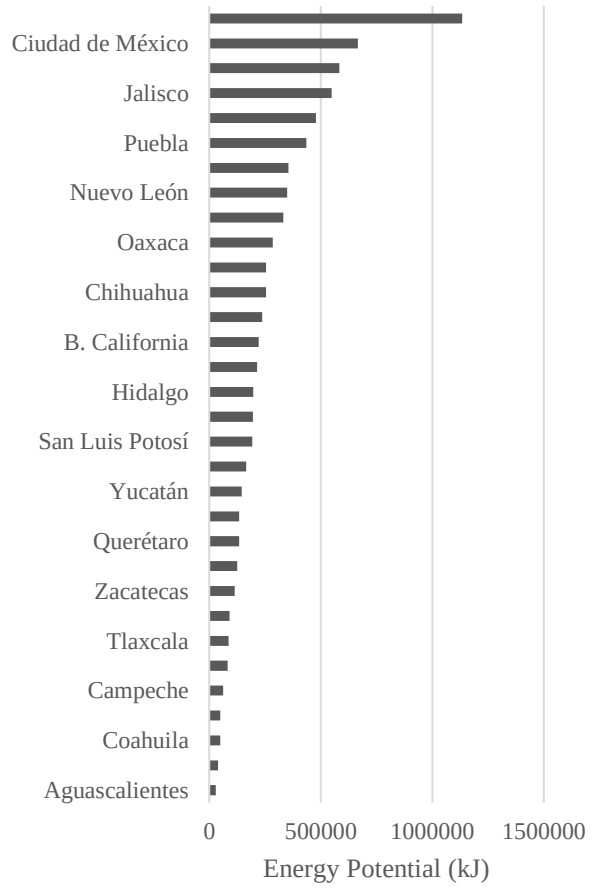

Figure 1 Energy potential averages for each state through ten years.

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On the other hand, Table 1 shows the global energy potential generated for each year. It is possible to observe a positive tendency that increase over the years.

Año	PERSU total (kJ)
2014	10,001,574
2013	9,063,809
2012	8,842,587
2011	8,626,217
2010	8.414.585
2009	8,207,583
2008	8,005,103
2007	7.807,043
2006	7,613,299
2005	7,423,775

Table 1 Global energy potential by using the urban solid *wastes through the ten years.*

Main cities generators of USW

It was identified the main USW generators cities in each Mexican state. The analysis was made regarding on a base amount of 200,000 kg urban solid waste (organic fraction). At the end the following states were identified: Baja California, Coahuila, Chiapas, Chihuahua, Ciudad de México, Durango, Guanajuato, Guerrero, Jalisco, Estado de Mexico, Michoacan, Nuevo Leon, Puebla, Queretaro, Quintana Roo, San Luis Potosi, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz and Yucatan.

These states had at least one city with 200,000 kg of wastes generated.

It can be observed in Figure 2, that the main states with four or more cities generators of more than 200,000 kg wastes are Ciudad de Mexico, Estado de Mexico, Guanjuato and Jalisco.

Figure 2 Main states generators of urban solid wastes

Estimation of energy potential. 2020-2030. Comparison with Sustainable Development Goals (SDG)

For this section also it was considered the information obtained from INEGI and CONAPO to calculate the population in this years considered a linear growth rate and after that it was possible to obtain the global generation in each state.

The above considerations were assumed with the objective to compare with the SDG emitted by the ONU (United Nations Organization) which include the perspective and goals to impact on some aspects like poverty, hunger, discrimination, and to promote gender equality, well-being, etc.

The Table 2 presents the result about the estimation of energy potential to both years, 2020 and 2030.

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Year	EPUSW (kJ)
2020	10,744,355
2030	19,982,524

Table 2. Estimation of Energy Potential to 2020 and 2030 in Mexico.

Discussion

Use and management of USW represents a challenge due the amount generated and the environmental impact in soil and water in Mexico and worldwide.

According to the results it was observed that the greater amount of wastesare generated in the central part of Mexico.

Aguilar et al (2009), described a composition of wastes in Vicente Guerrero, Estado de Mexico, the paper concludes that 83% of total wastes generated have potential of exploitation.

Yanez (2005) made a proposal for the improvement of municipal management for handling of household solid waste in metropolitan región in Chile, and considered that this research is a contribution to achieving the goals of reduce, reuse and recycle and save the economy.

Due to the amount of potential energy generated by the use of resiudes, it has an important impact on human activities.

Bitran and Associates in (2003), based on existing theoretical relationships, determine that the potential of generation of biogas from household waste, depends of variables such as: amount of waste deposited regularly in landfills and their accumulation, the conditions of the disposal of USW, general conditions regarding weather variables, age of landfill, percentage of the organic fraction in wastes, etc.

The results show that in this case due the considerations about the population growth and the rate of generation of wastes, the amount of wastes generated, is directly proportional to the energy potential. This can be observed for Ciudad de Mexico, Estado de Mexico, Veracruz, Jalisco and Guanajuato.

To see the importance and benefit to use the energy potential from USW it can be possible make a comparison; a petajoule is a unit of measurement of heat and energy that is used to quantify large amounts of energy. About little more than 277 million kilowatt hours (KWh). And it is reported that in Mexico 2009 the consumption of alternatives energy sources was of 6.9 petajoule (SENER, 2011). Murphy and McKeogh (2006) have reported that in any municipal solid waste incineration system, about 15% of the wastes is available as electricity. Again, municipal solid wastes from 1,000,000 person equivalent could power 12,400 cars; provide electricity for 30,900 houses and heat 15,100 houses in Europe and United States.

In this work it is clear to see that the energy potential of USW is insignificant compared to the consumption in Mexico, but the environmental impact is great.

Sustainable Development Goals

On September 25th 2015, countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development (UN, 2016). This compilation of Sustainable Development Goals (SDG) are focused in the human wellness worldwide and they are specified for a period between 2020 and 2030. The UN says that everyone needs to do something to reach the aim about the SDG, which are regard in the follow points:

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1. *No poverty*
2. *Zero hunger*
3. *Good health and well-being*
4. *Quality education*
5. *Gender equality*
6. *Clean water and sanitation*
7. *Affordable and clean energy*
8. *Decent work and economic growth*
9. *Industry, innovation and infrastructure*
10. *Reduced inequalities*
11. *Sustainable cities and communities*
12. *Responsible consumption and production*
13. *Climate action*
14. *Life below water*
15. *Life on land*
16. *Peace, justice and strong institutions*
17. *Partnerships for the goals*

In this work, according to the study and the results obtained for years 2020 and 2030, we focused mainly in the follow SDG:

- Affordable and clean energy
- Sustainable cities and communities
- Climate action

Our work is address to enhance a sustainable change for allowing us a better quality of life with the use of alternative energy. In this case we observed that the quantity of energy potential in 2020 and 2030 from USW is considerable, besides, this is only considering the 53% of organic fraction, if we would have clean technologies to convert easily the rest of wastes, the energy potential would be greater. Also, the use of USW to produce clean energy has colateral benefits, for instance the contamination may decrease and the problematic about the disposal of USW may stop.

Conclusions

The results of this work show the potential for considering the wastes as a non conventional source of energy, impacting not only on the environment but also on the developing of new technologies for improving the generation and use of the energy.

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Program of payment for environmental services and their impact on rural women from three cultures in the state of Guerrero

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Abstract

The payment for environmental services program and its impact on peasant women belonging to three cultures in the state of Guerrero. The social, economic and environmental impacts that the payment for environmental services (PES) program has on the development of women and their environment within three different cultures will be analized, as well as the problems they face while being an active part in the management of their natural resources. The study is being conducted with six peasant communities (Na'savi, Náhuatl, Mestizo) in three regions, all of them with high and very high degrees of marginalization. Three of them have been involved in a process of participatory planning for community development within the frame of PES, in the category of 'Biodiversity Conservation'. Information will be obtained by means of the application of a survey, semi-structured interviews, focal group meetings, and field transects.

The PES financing agency only provides economic support for the activities of natural resource conservation, but it does not carry out evaluations of the social, economic and environmental impacts. The study intends to fulfill this gap and to contribute with the evaluation of the importance that participating or not in the PES program has for the involved communities.

Environmental services, Women, Nahuatl, Na'savi, Mestizo.

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Introduction

The environmental services provided by the forest are many. Among others, carbon sequestration, oxygen production and clean water, control soil erosion, climate regulation, are places for food, reproduction and shelter for many species of wildlife, plus they provide a rich landscape. Directly influence the maintenance of life, generating benefits and welfare for people and communities. Regularly, environmental services are free for people who enjoy them while owners and owners of forest lands that provide them are not compensated in any way for it (CONAFOR, 2012).

Thus the Environmental Services Program (PSA) raises the conservation of biodiversity, poverty reduction and development in the same methodological package. In Mexico, the PSA are regulated by federal, state and local agencies and occupy an area of 3080.500 hectares of the national territory, of which 2,325,400 has provided water environmental services, while at 755.100 has been working with environmental services derived from biodiversity (CONAFOR, 2012).

Guerrero has been invested from 2004 to 2010, 160.5 million pesos to conserve 77,000 hectares of forests. For the northern region of the state has benefited 22 ejidos and communities in six municipalities with a total of 24.8 million pesos for the conservation of 13 thousand hectares of forest and woodland. This investment was mainly channeled supervision (not specified what kind), deliver reports and participate in campaigns reforestation and forest regeneration (CONAFOR, 2012). This paper examines the impact of the payment for environmental services on the development of women of three different cultures and the problems that have faced an active part in the management of natural resources is analyzed.

The funding agency of this program is only limited to providing financial resources to carry out activities of conservation of natural resources, but does not perform assessments of their impact on social, economic and environmental dimensions of the communities involved.

Six agrarian groups, of which three have the Environmental Services Program were selected. They can compare the organization of living in communities regarding the conservation of natural resources. Agricultural centers involved in research are distributed as follows: Costa Grande region (ejidos of San Vicente de Benitez and Cold Water, in the municipality of Atoyac de Alvarez); Costa Chica region (Communal Lands of Yoloxóchitl and Cuanacaxtitlán, in the municipality of San Luis Acatlan); and Mountain region (Communal Lands of Copanatoyac and Ocotequila, both in the municipality of Copanatoyac).

It is essential to assess and highlight the role of women not only as the foundation of the family, but from the income earned as a collaborator and operational part in the development of Environmental Services Program. With this, you can view the progress of their skills and empowerment that are achieving as ejidatarias and comuneras registered collective interest in projects in their communities.

This argument is that this study will generate core knowledge on the participation of women in programs that pay attention to equity, equality and social inclusion. Moreover, women in three ejidos and communal property not yet involved in implementing such programs, without for that reason they are no longer important as generators of knowledge and caretakers of natural resources are found.

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This research is useful to implement knowledge of three regions in the state of Guerrero in which has been little studied women's relationship with the environment. Therefore, it is expected to provide information on the one hand, to decision makers and actors involved in promoting community development. And secondly, the same communities and women who live and work in them.

Methodology to develop

Research in adult men and women belonging to three agricultural centers included in the PES program participants. The information obtained will be contrasted with that is generated with adult women and men of three other agrarian centers which to date do not participate in the program.

Agrarian groups with which the study was conducted are as follows (Table 1):

Core	Culture agrarian	region	participates in PSA program
Costa Chica	Bienes Comunalesde Yoloxóchitl	Na'savi	Yes
	Bienes Comunales de Cuanacaxtitlan	Na´savi	No
Costa Grande	Ejido de San Vicente de Benítez	Mestizos	Yes
	Ejido de Agua fria	Mestizos	No
Montaña	Bienes Comunales de Copanatoyac	Náhuatl	Yes
	Bienes Comunales de Ocotequila	Náhuatl	No

Tabla1 Agricultural cores where the study was done

Recolecciony information analysis
It will be developed by combining quantitative and qualitative techniques. Within the first, it will be carried out a survey (Lopez, 1998; Briones, 1996) between the ejidatarias / comuneras of each of the six agricultural centers participating in the study.

Some qualitative research techniques will also be used as semi-structured interviews with qualified informants (Ander-Egg, 1995); and the focus group (Morgan, 1996; Gibbs, 1997; Van Veldhuizenet al, 1997;. Russi-Alzaga, 1998). With the application of these procedures will be obtained information about knowledge on issues related to the conservation and management of natural resources in common use (water, soil, biodiversity, etc.), the perception of the impact it has had on their lives to participate or not in the PSA, and to gather local knowledge on the floristic diversity and to characterize the cultural importance of trees present in the territories of the agrariosparticipantes nuclei. The field trips with the participants would record the floristic richness in the territories involved and the state of preservation of the environment, as indicators of the health of the ecosystems.

As auxiliaries for analyzing the information obtained SPSS (for quantitative analysis) and 7.0 Atlas.ti (for qualitative) are used.

Results

The investigation is in its early stages of fieldwork. According to data that have been collected to date the ejido and community members are taking an active part in the project and it is serving to both the conservation of its natural resources to generate temporary jobs for both men and women localities involved.

With this, ejidosy communities gain important leadership in the regions in the care of their natural resources and the generation of revenue in the localities. The general population is showing that with perseverance and work can get opportunities to reduce emigration in the towns of these agrarian communities, which is a factor of loss of human resources for the development of the region.

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It has been observed through the first interviews, with the PES program perception among women about their chances of development begins to undergo changes, puesaprovechanla income opportunities in their communities without being forced to emigrate, while improving their level and quality of life and bringing benefits to mankind through the conservation of natural resources and environmental services they provide.

Regarding the three farming communities that do not have the PSA program, a process of gathering information on the social organization Ylos uses and customs for the conservation of natural resources is performed. It is observed that has genarado the interest of women in these communities to participate in the program. They believe that even without an economic payment for the valuation of their resources, have made efforts to preserve them.

The active participation of women in brigades, in addition to providing positive program outcomes, has enabled them to acquire a sense of satisfaction expressed by all interviewees, who point out that for the first time it takes takes into account for paid work in their communities; thus, they have the perception of being important part in the care and preservation of natural resources while provide income for their households.

Conclusions

Payment Program for Environmental Services has begun to benefit alos suburbs with employment opportunities.
E

Among the participants in the project a perception of success and raising their self-esteem to have been benefited with financial resources for the conservation of its natural resources.

There is a perception, especially among participating women and youth, it is possible to earn income without being forced to emigrate while improving their quality of life and bring benefits to mankind through the conservation of natural resources and services environmental that they provide.

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Flora and Fauna in Federal Protected Areas of Mexico (FPAM): A sustainable vision?

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Abstract

Among the goals, I can mention: ***a)*** synthesis of the characteristics about flora and fauna and ***b)*** critical analysis about the sustentability in the FPAM.

The method used was sustained in the documentary material checking: archives, books, magazines, Web pages on Internet, printed statistic data consulting, digital data bases, chart interpretation, aerial photography and fieldwork in FPAM mainly 12 states of Mexico, that included the direct observation, exploratory routes, photographic interviews with members of non-governmental organizations. In this sense, the approach is multimodal or mixed since the qualitative and quantitative points of view through and they define the reach of this investigation with explanatory character.

The results were: the FPAM locally protect different vegetation and fauna. The pine, holm oak or "*oyamel*" forest is the best presentation of vegetal association. In the fauna, the vertebrates excel, many of them are endemic and others are endangered. To conclude, we can say that 1) the FPAM keep samples of almost all the range of existing flora and fauna in Mexico and 2) the presence of naturals resources are in problems of hazard.

Flora, Fauna, Federal Protected Areas of Mexico, sustentability

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Introduction

Mexico has great physical-biological wealth that generates environmental goods and services through its biodiversity and wild spaces. It has motivated the adoption of a conservational attitude to save the natural patrimony of the country, since the FPAM are an alternative to maintain the integrity of the ecosystems. At the moment, the declaration, handling and administration of these areas are in charge of CONANP (*Comisión Nacional de Áreas Naturales Protegidas*, which means National Commission of Natural Protected Areas) whose policy tends to favor processes of supporting development in which diverse sectors of the national society concur, and the restraining and reverting of the degradation that hits the atmosphere and its natural resources are implicit. Therefore, to preserve habitats in their natural state demands to maintain some areas in the margin of the anarchical human intervention.

First of all, we would like to refer to the definition that was proposed in the 90's of the last century about the Protected Natural Areas and the own characteristics of each category that were united in the LGEEPA (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*, which means: General Law of the Ecological Balance and the Atmosphere Protection).

LGEEPA defined the zones of the national territory and those on which the Nation extercises its sovereignty and jurisdiction as ANP in which the original atmospheres have not been strongly altered by the activity of man and have been subject to the protection regime (Porrúa, 1991:2-3).

To sum up, paying special attention to this document, we can see that ANP in Federal Jurisdiction are the ones that are enunciated:

"RB (*Reserva de la Biósfera*, which means: Biosphere Reserve) will be constituted in excellent bio-geographical representative areas, at national level, of one or more non-altered ecosystems and at least, a non-altered zone in which species considered as endemic, threatened or endangered ones live and whose surface is greater than 10,000 hectares" (*Ibid*., 1991:31). In other words, they constitute representative bio-geographical areas of not too altered ecosystems in which excellent endemic or endangered species of biodiversity inhabit.

PN (*Parque Nacional*, which means: National Park) "will be constituted according to this Law and the Forest Law, in forest lands, being bio-geographical representations, at national level, of one or more ecosystems according to their scenic beauty and scientific, educational or recreational values, also their historical value due to the existence of flora and fauna of national importance, because of their aptitude for the development of the tourism, or for other analogous reasons of general interest" (Porrúa, 1991:32), this means that this law refers to areas with ecosystems with scenic beauty and educational, recreational and historical values which are important because of their flora and fauna and tourist aptitude.

MN (*Monumento Natural*, which means: Natural Monument) "will be settled down according to this Law and to the Forest Law in areas that contain one or several natural elements of national importance, consisting of natural places or objects that, due to their unique character, are solved to be incorporated to a regime of absolute protection. Such monuments do not have the variety of ecosystems nor the necessary surface to be included in other handling categories" (*Ibidem*., 1991:33). It contains elements that, due to their unique character, aesthetic, historical or scientific values, are joined up to regime of absolute protection.

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It does not have a variety of ecosystems nor wide surface to include it in other handling categories.

PMN (*Parques Marinos Nacionales*, which means: National Marine Parks) "will be settled down in Marine Zones that are comprised of the national territory, and will be comprised of beaches and the contiguous federal terrestrial-marine zone. In these areas only activities related to preservation of the aquatic ecosystems and its elements will be allowed, and those of ecological investigation, recreation and education, as well as the advantages of natural resources that have been authorized, in accordance with what this Law provides, the Federal Law of Fishing, the Law of the Sea, the other applicable laws and their regulations, as well as the effective norms of the international right" (*Op. Cit.,* 1991:33).

APRN (*Área de Protección de Recursos Naturales*, which means: Protection Area of Natural Resources) "are those destined for the preservation and restoration of zones and waters. The following areas are considered within this category of handling: I. Forest reserves; II. National forest reserves; III. Protective and forest zones; IV. Zones of restoration and forest propagation, and V. Zones of protection of rivers, springs, deposits and in general, water sources for the service of populations" (*Ibid*., 1991:33 - 34). It preserves and protects grounds, hydrologic basins and forest land resources in reserves of rivers and water bodies.

APFF (*Área de Protección de Flora y Fauna*, which means: Flora and Fauna Protection Area), "aquatic and wild areas that will be constituted in accordance with the requirements of this Law, the Federal Laws of Hunting and Fishing and the applicable ones, in the places where habitats are contained.

Since the attendance, transformation and development of the species of wild and aquatic flora and fauna depend on these places' balance and preservation" (*Op. Cit.,* 1991:34). It contains habitats whose balance sponsors the presence, transformation and development of species of wild flora and fauna.

S (*Santuario*, which means: Sanctuary) is an area with great wealth of flora or fauna, or because of the presence of species, subspecies or habitat of restricted distribution, including gorges, fertile valleys, grottoes, natural wells, geographic creeks or other units that need to be protected. Beaches, priority enclaves which will be protected in the immediate future against the contamination are left outside; this contamination can be visual, made by urban solid remainders, physical-chemical of black water in bordering urban centers.

Some ANP of Mexico show a rational handling and others have been hit negatively by lack of planning which risks the maintenance of the physical, biotic, geo-morphological and cultural resources that integrate them.

The purpose of the essay is to increment the interest in the flora and fauna elements of the Mexican natural resources. It is important the planning of resources accompanied for better environmental management has resulted in maximal preservation of the national territory and to get the ecological equilibrium. This act increase the esthetic of the nature reserve and the environmental educational potential, the cultural knowledge and human welfare of the FPAM. The flora and fauna provides the visitors with a place to recuperate physically, mentally and spiritually.

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It is important to make this study because it allows us to offer a didactic-practical vision that briefly enriches the general diagnosis of the flora and fauna in FPAM in the actuality. Moreover, it sketches a strategic planning that makes it possible to take firm steps towards the achievement of the environmental and economic maintenance of the people that live inside or on the margins of the Federal FPAM.

A question relevant was Which is the actual situation about flora and fauna in FPAM?. There are six sections that integrate this essay, these sections are: introduction, objective, methodology, results, conclusions and references.

Objective

To explain the factors and consequences that affect the lifetime flora and fauna in the FPAM.

Methodology

Firstly, an office work was carried out through consultation of digital and printed literature of topics as the competitiveness of the flora and fauna (Sepúlveda, 2008); nature tourism (Chávez, 2005); sustentability (López, 2008); ecogeographic method of Melo & Niño (2003) and touristic space planning (Pérez, 2004).

It is sustained in the documentary material checking: archives, books, magazines, Web pages on Internet, printed statistic data consulting, digital data bases, chart interpretation, aerial photography and finally fieldwork in FPAM mainly Chiapas (Niño, Melo & Castillo, 2008), Estado de México (Melo & Niño, 2003), Guanajuato (Niño & Saldaña, 2014a & 2014b), Guerrero (Niño, 2009) y Michoacán (Correa, Niño & Segrelles, 2013).

That included the direct observation, exploratory routes, photographic interviews with members of non-governmental organizations, photography and videos. In this sense, the approach is multimodal or mixed since the qualitative and quantitative points of view through the General Theory of Systems and the Geography of the Landscape are conjugated and they define the reach of this investigation with explanatory character.

Results

The total of the FPAM covers terrestrial and aquatic surface of 25' 628, 239 Ha and it represents 13.5% of the country. The BR show the greater extension and the NM, the minor **(Table 1)**.

Decreed total	Name/Number	Abbreviation/ surface
39	Flora and Fauna Protection Areas	FFPA
8	Natural Resources Protection Area	NRPA
5	Natural Monuments	NM
66	National Parks	NP
41	Biosphere Reserves	BR
18	Sanctuaries	S
177	**6**	**25'628,239 ha**

Table 1 Categories of FPAM. Source: Conanp, 2016.

Regarding the impact, the FPAM locally protect different vegetation and fauna. The pine, holm oak or "*oyamel*" forest is the best presentation of vegetal association with predominance in the NP; the S speciallly spreads coastal dune vegetation; and after these, we have the *xerophilous scrub* [*plants, scrub and/or trees that live in dry lands*] and the low *deciduous forest* [*forest whose trees lose their leaves in autumn*].

The *mesophyllous forest* [*forest with plants and/or trees with leaves in the middle*]

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has scarce representation on mountain and "*petenes*". I can say that the FPAM keep samples of almost all the range of existing vegetation in the country.

In the fauna, the vertebrates excel, many of them are endemic and others are endangered; there are also two invertebrates ("*lepidóptero*" [insects with complete metamorphosis] which are migratory: Monarch butterfly, "*celenterados*" [*a kind of mollusks and crustaceans*], "*equinodermos"* [*like starfish*], crustaceans, mollusks and coralline reef).

The mammals better represented are "*artiodáctilos*" [*mammals with two fingers and nails*] (mottled and/or wild lamb, wild boars, white-tail deer and/or bura) and Felines (cougar and/or jaguar, ocelot, lynx, jaguarindi and margay); and lodge cetaceans (migratory gray whale, manatee or sea cow and totoaba) and "*Pinnípedos*" (marine seals or elephants).

Among the birds, the "*Falconiformes*" (golden eagle, harpy eagle, fishing eagle, elegant eagle and others, travelling hawk and king buzzard), there are also the "*Psitaciformes*" (mount parrot, macow and other parrots) and "*Galliformes*" (quail, wild peacock, mount hen, pheasant and dotted and colorful peacock); the most frequent bird is "*Cracidiforme*" (kind of pheasant).

Scaly reptiles (constrictor boa and/or Nauyaca serpent, chameleon, iguanas, Gila monsters, colar snake, rattlesnake and swamp or river crocodile), and at a minor grades, the "*Quelonios*" (migratory and/or local marine turtles, turtois, river turtle and desert turtle). It is important to emphasize that the numerous islands of the Gulf are officially catalogued as a unique area of flora and fauna protection.

The unit called "River basin of the Caribbean" and that of the Gulf of Mexico.

Are important the BR and FFPA categorize the tropical-humid zone populated with rainy, high and medium forests, and savannahs; at the same time, in barren-semi-arid ones where there are a lot of scrubs and pastureland.

Finally, remarkable invertebrates like the migratory monarch butterfly winter and the coralline reefs that beside their fauna. I can say that the FPAM constitute the only and best fauna refuge in Mexico.

Flora and fauna, integrates the natural resources of the terrestrial and marine landscape minimizing the socioeconomic impact to the natural heritage and promote activities such as bird watching, and hiking among others. They are fragile geosystems. This zone will help maintain, preserve and conserve the landscape as well as the natural resources and promote the development of scientific activities, which will to prevent negative environmental consequences to the ecosystems.

The preservation of the flora and fauna has, as an obstacle, the deficiency of handling programs, which combined to diverse regimes of soil possession causes the anarchical use of the soil and natural resources, which results in ecological imbalance and loss of flora and wild and aquatic fauna.

The most damaging actions are the settlements, from which cattle and agricultural activities derive. Coral extraction and oil installations are less frequent but also damaging in the Southeast Mexico and even mini-tourist recreational infrastructure in NP and others areas categories.

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In general, the knowledge from the origins and fruition of the national movement on FPAM but in particular FFPA shows the multiple environmental, social, economic, scientific and cultural functions that they provide mankind through their conservation and adapted handling. Regarding our country, it is urgent to understand and reflect on the causes of the problem that prevent the protected areas from joining an authentic process of sustentability.

Where the indicators of sustainability are interrelated in its various aspects such as the physical component which includes the slope of the ground, plant development, agrological capacity (depth, fertility, development and stoniness), gathered from coverage and water erosion; biotic component, presence or absence of vegetation (deforestation) and anthropic component, such as the total population, economically active population, economically inactive population, wages, occupation, production, consumption, index of marginalization (housing, services, access roads, transportation, food supply center).

The strategy is an adjustable process whose aim lies in "meeting the set of rules to ensure a better decision in every moment". The challenge here is to make the right decisions at the right time since carrying out a developmental option rarely relies on clearly distinguishable and instantaneous events (Oñate, Pereira, Suárez, Rodríguez & Cachón, 2002).

The public use of the resource, refers to protected natural areas in operation, it seeks to know the interrelation between visitors, facilities and services, as well as the impact that public use exerts on the environment in order to detect the type of most frequent activities, the number of participating users and favorites sites for their performance.

Conclusions

It is capital idea to say that 1) the FPAM keep samples of almost all the range of existing flora and fauna in Mexico therefore are biodiversity containers and other physical natural resources that are incorporated to the regional and/or local development by means of the development of productive projects (eco-tourism, supporting agriculture, wild fauna raising, forest exploitation, aqua-culture, crafts, etc.) and 2) the presence of naturals resources are in problems of hazard moreover, it is priority to implement the conservation (forest prevention of fire, ecological restoration, zone setting, important species handling, etc.); of investigation (biological inventories, studies of environmental impact, polluting agents monitoring, data-basis making, studies of territorial ordering, etcetera).

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Article **ECORFAN-Ecuador Journal**
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Aphids and disease in lemongrass (*Panicumdactylon* L.).

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Abstract

Aphids limit the development of crops due to direct damage to plants and for their efficacy in disease transmission. This work was done in Chilpancingo, Guerrero to detect aphids and disease transmitted in lemongrass. The plot had an area of 10x10 m with 80 plants three months of development. Plants were sampled with a design completely random. Collections of specimens were performed using the method of sweeping net. The insects were identified Triplehorn keys and Nault. The disease was detected was produced by *Spiroplasmakunkelii* Whitcomb persistent-propagative transmission by leafhoppers (leafhoppers) of Deltocephaline*Dalbulusmaidis* (DeLong & Wolcott) family. 25 plants were counted with the presence of whiteflies which made up 31% incidence, 20 of them showed symptoms of chlorosis, red foliage and involvement in its development, in May there were no symptoms. This indicated that their effectiveness in field Spiroplasma transmission was 80%. The severity of damage that occurred in them was 30%. 5% thereafter showed masking of symptoms.

Aphids, lemon grass, *Panicumdactylon* L., *Spiroplasmakunkelii.*

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† Researcher contributing first author.

Introduction

Lemongrass is an herb fresh and citric aroma, its leaves are long, as strips, light green, form clusters, belongs to the Kingdom Plantae, PhylumMagnoliophyta, Class Liliopsida, Order Cyperales, Family Poaceae. This plant is native to India and grows in warm and temperate climates semiwarm or sea level in tropical forests, spiny forests and cloud mountain or forest of oak and pine. Lemongrass is disinfectant, stimulant and antioxidant. Its frequent use stimulates good digestion preventing the formation of gases and sudorífico.

Dalbulusmaidis corn planthopper (DeLong & Wolcott) is the main vector of the S*piroplasmakunkeliiWhitcomb* bacteria. This bacterium causes corn stunt (*Zeamays* L.) belongs to the class Mollicutes and cause major crop losses in Latin America (Nault, 1983), for lack of cell wall are pleomorphic organisms present in the phloem of plants affected. The corn stunt is an endemic disease with damage reaching 70 to 100% in the most severe cases, with the biggest losses where plantings were delayed by irregular rainfall and where Johnson grass (S*orghumhalepence*) is which is a natural reservoir for the pathogen and the insect vector (Henriquez and Jeffers, 1997). In El Salvador it was determined that the biological cycle lasts 20-25 days *Dalbulusmaidis*. In Central America leafhopper need five or six weeks to complete a generation with the ability to meet six to eight generations per year in the Pacific by high temperatures and dry climate that favor the development of insect pathogens (Córdoba and al. 1989).

These pathogens can not be transmitted mechanically or by seeds. They are transmitted in the vector in a persistent manner and multiply in it.

Leafhopper sucks the sap, causing damage when transmitted disease stunting and thin stripe which can inhibit the formation of ears. When the early attack occurs in plants symptoms are poorly developed roots, short stem, tillering, yellow and red leaves, low production of pollen and seed formation (Córdoba et al. 1989).

The problem aphid has become a limiting factor for optimal crop development due to direct damage to plants and their effectiveness in disease transmission. Work is required detection of aphids and symptoms produced by pathogens that spread in lemongrass as it affects the production for damage occurring in the coloration of foliage and its development.

Materials and methods.

This experimental work was performed in a culture of lemongrass located in Chilpancingo, Guerrero, with the coordinates 17º11 'and 17º37' north latitude and 99º24 'and 100º09' west longitude, at 1370 meters. The climate is humid-temperate, the temperature ranges from 15 ° C to 24 ° C. The soil type is of sedimentary origin, forming textured gravel conglomerates, secondary vegetation is composed by scrub. The plot of the crop had an area of 10x10 m with a development of four months, 80 spaced 1.0 m plants. The plants were sampled with a completely randomized design throughout the plot to monitor insect populations present and enfermas.La plant specimen collection was performed by the method of sweeping net, with the capture of insects is set bag network in the wide mouth jar containing a alcohol, brought to the laboratory where they were identified as keys and Nault Triplehorn (1985). In the sampling of the field plants and whiteflies they were presenting symptoms of disease to determine its incidence were recorded.

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The severity was established considering the degree of damage that had diseased plants.

Results and discussion

Symptoms of the disease in lemongrass demonstrated in the leaves that turned purple effect of the pathogen inoculated by the insect. The insects collected were identified as D*albulusmaidis* (Delong & Wolcott) of the order Homoptera Cicadellidae family, their morphological characteristics. Adults are yellow with two black round spots on the top of the head, the hind wings are translucent and long, the nymphs are yellow translucent and lack spots. The eggs are yellow, elliptical. Nymphs go through five stages lasting 10 to 14 days at temperatures of 26 ° C before becoming adults. Vectors feeding on a plant pathogen acquire sick and spread the infection until they die. The spiroplasma is transmitted in a persistent-propagative manner by leafhoppers (leafhoppers) of Deltocephaline (Ortega, 1987) family.

In reviews of the plot they were counted 25plantas presence of whiteflies what a 31% incidence.

The symptoms were detected in 20 plantaslo which accounted for 25% incidence, without manifesting symptoms in the other five who had the plague, which represented 20% of uninfected plants, this indicated that field effectiveness of transmission *Spiroplasm* it was 80%.

The severity of damage that occurred in them was 30%, chlorosis appeared first in the leaves, then took to dry prematurely reddish colors. 5% of plants showed symptoms lemongrass with masking (disappearance of symptoms) after three weeks of the presence of the disease.

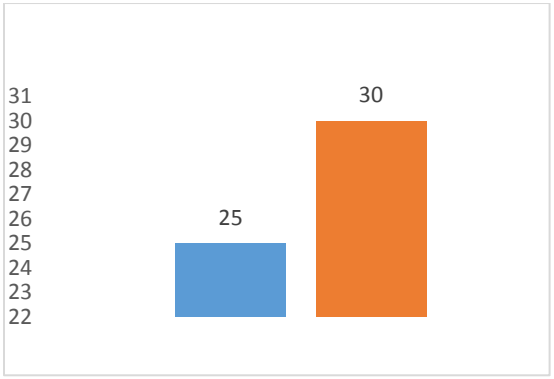

Figure 1 Percentage of incidence and severity of disease in lemongrass (PanicumdactylonL.).

Conclusions.

D*albulusmaidis* (DeLong & Wolcott) is the pest was detected enzacate lemon with a 31% incidence.

Lemongrass presented a disease caused by bacteria S*piroplasmakunkeliiWhitcomb*, symptoms were detected in 25% of plants. *Dalbulusmaidis* field had an effective transmission Spiroplasma 80%. The severity of damage that occurred in the plants caused by *Spiroplasm* was 30%.

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NATURAL December 2015 Vol.2 No. 3 200-202

Mammals of medium size and large from an area for the Conservation Voluntarily (ADVC) of Mexcaltepec, Guerrero, Mexico

GARCÍA, Isaias†*, PÉREZ, Rebeca, ALMAZÁN, Alberto

Received August 5, 2015; Accepted november 24, 2015

Abstract

In Guerrero three natural reserves have been ordained, "El Veladero" "Juan N. Álvares Park" and "Grutas de Cacahuamilpa National Park" because of their scenic beauty but no because their biological and ecological functions elements, the new category "Area Intended to Voluntary Conservation" (ADVC in Spanish) seeks a balance between the owners of the forest and the natural resources. Therefore, the purpose of this study is to develop a wild mammals list of medium and large size of one ADVC in the community of "Mexcaltepec". For this we used methods such as fingerprints and excrement, also we used camera traps in the core zone.As a result we obteined 156 images corresponding to 14 species grupued in 7 orders and 10 families. Of the 14 species 3 are list in to the NOM-059-SEMARNAT-2010 (*Leopardusweidii*) (*Tamanduamexicana*) as endangered species, while (*Herpailurusyaguarundi*) as exticion endangered.

Wild mammals, Species, ADVC

Citation: GARCÍA, Isaias, PÉREZ, Rebeca, ALMAZÁN, Alberto. Mammals of medium size and large from an area for the Conservation Voluntarily (ADVC) of Mexcaltepec, Guerrero, Mexico. ECORFAN Journal-Ecuador 2015, 2-3: 200-202

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Introduction

Studies of wild mammals are important mainly because of its relationship with the ecosystem, are pollinators, seed dispersers, growth regulators and distribution of plants and animals also are effective pest and insectos.Para Guerrero state drivers have registered about 152 species of wild mammals, representing 33% of terrestrial mammals of Mexico (Ramírez-Pulido et et. 2005) This diversity is mainly due to the physiographic, climatic and ecological characteristics that present the state of Guerrero, which They offer a variety of habitats, shelter and food.

At the federal level in Guerrero they have been declared three Proptegidas Natural Areas (PNA): The Veladero, Parque Juan N. Alvarez and Cacahuawamilpa Caves National Park; which they were enacted for its scenic beauty, not their biological elements or ecological functions. This expropriation caused social, political and land disputes; and consequently greater environmental degradation of forests and ecosistemas.Por therefore, the new category "Destined to Voluntarily Conservation Area" seeks a balance between forest owners (living in communities) and natural resources (flora and fauna) to achieve its conservation and sustainable use. Therefore, the objective of this work is to record wild mammals that live in a ADVC in the community of Mexcaltepec, for solid elements (fauna-mammals) for their protection, unlike other categories that handles CONANP (expropriations) .

Methodology

Mexcaltepec is located in the municipality of Acatepec, in the state of Guerrero. The climate is warm humid with summer rains. Vegatation type is pine, pine-oak and oak.

Recording medium and large mammals size was performed by van tours and hiking paths and trails. indirect records such as footprints and excrement, which were found in key locations such as the banks of waterholes, rivers and streams were also used. a total of 12 camera traps brand Cuddeback (digital) Attack-1149 model were placed. These cameras have a range of highly efficient detention, have a motion-sensitive sensor and automatically triggered when the animal passes in front of it. Be scheduled as follows: time (hour, minute), date (day / month / year), power and flash range (9.14 m), length of video (10 s), operation time (night, day, night day), image quality (high) number of trap (n = 1

Results

In total 156 images were obtained, corresponding to 14 species, grouped in 7 orders and 10 families. The order Carnivora best was represented with seven species (50%), followed by two species Artiodactyla (14.2%). The richest family Felidae and Mustelidae were three species each. Of the 14 species, three are listed in NOM-059-SEMARNAT-2010. Ocelot (Leopardusweidii), the anteater (Tamandua mexicana) are listed as endangered species (P); while the yaguarundí (Herpailurusyaguaroundi) as Threatened.

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Annexes

Order Family Species	Common Name
DIDELPHIMORPHIA	
Didelphidae	
Didelphis virginiana	Tlacuache
CINGULATA	
Dasypodidae	
Dasypusnovemcinctus	Armadillo
PILOSA	
Myrmecophagidae	
Tamandua mexicana	Anteater
LAGOMORPHA	
Leporidae	
Sylvilagusnicularius	Rabbit
RODENTIA	
Sciuridae	
Sciurusaureogaster	Gray squirrel
CARNIVORA	
Felidae	Tigrillo
Leoparduswiedii	Puma
Puma concolor	Yaguarundi
Puma yagouaroundi	Gray fox
Canidae	Weasel
Urocyoncinereoargenteus	Cadeno zorrillo
Mustelidae	Raccoon
Mustela frenata	
Conepatusleuconotus	Pecari
Procyonlotor	Whitetail deer
ARTIODACTYLA	
Tayassuidae	
Pecaritajacu	
Cervidae	
Odocoileusvirginianus	

Table 1 List of wild mammals of Mexcaltepec

Conclusion

Wealth ADVC recorded this represents 9.2% compared to the state wealth. The best order is Carnivora represented with 7 species. And families with more species were Felidae and Mustelidae. The second order was Artiodactyla best represented with two families.

Three of the 14 recorded species are in a risk category according to the NOM-059-SEMARNAT-2010. These species are important in achieving this area as ANP decree also financial resources are available for protection. The protection of these mammals could function as an umbrella effect, protecting the forest and therefore the other species that inhabit it.

Finally this ADVC of Mexcaltepec not estáexenta anthropogenic fragmentation issues (logging, fires, cattle), therefore it is important to continue the research of mammals in this area; to achieve in a short-term protection and conservation of natural resources and thus achieve the sustainability of the area.

Thanks

A CONANP-Mountain for funding this project. A Mexcaltepec Environmental Rangers (CONANP); for their help in field and field logistics.

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Ramírez-Pulido, J., J. Arroyo-Cabrales y A. Castro-Campillo (2005). Estado actual y relación nomenclatural de los mamíferos terrestres de México. Acta Zoológica Mexicana, 21:21-82.

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

Last name -First name, (in uppercase) -1st † Last name -First name (in uppercase) -2nd Author's name

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Abstract

Title

Objectives, methodology

Contribution

(150-200 words)

Keywords

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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.

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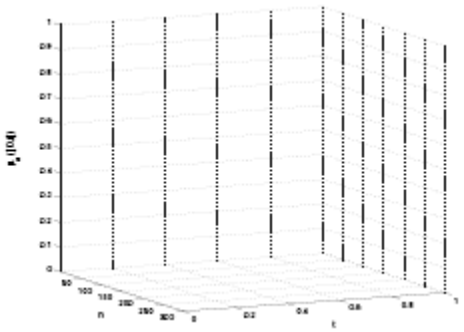

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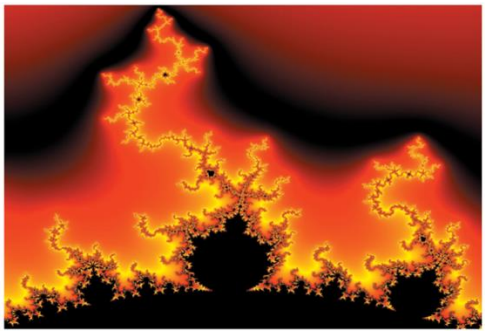

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"Aphids and disease in lemongrass (*Panicumdactylon* L.)."
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Universidad Autónoma de Guerrero
Colegio de Postgraduados
Tecnológico de Monterrey

Natural

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