

The levels of micro business production based on the phases of gypsum production through the descriptive method in District 2 of the Municipality of Sucre 2012

Medición de la eficiencia de marketing en el sector turístico del municipio de Sucre

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Abstract

This research ore tends to determine the production levels of district level 2 at Sucre municipality in the exit to Cochabamba area and nearby places, determining how many small enterprises exist, how big is their production and which machinery is used and which labor force exists. The plaster production includes dehydration or calcination, smashing or "chancado", packing, presentation, study tests, storing, etc. These phases are not performed completely by the small enterprises, and this research describes the study tests performed empirically and without a specific laboratory. The other phases have their own weaknesses during their process highlighted in de data analysis. It is proposed to improve the plaster production process, organization and distribution staring at a re-engineering and industrial technification in its production, by analyzing how many local enterprises work in this activity.

Resumen

Este mineral de investigación tiende a determinar los niveles de producción del nivel distrital 2 del municipio de Sucre en la salida a la zona de Cochabamba y lugares aledaños, determinando cuántas pequeñas empresas existen, qué tamaño tiene su producción y qué maquinaria se utiliza y qué mano de obra existe. La producción de yeso incluye la deshidratación o calcinación, el aplastamiento o "chancado", el embalaje, la presentación, las pruebas de estudio, el almacenamiento, etc. Estas fases no son realizadas en su totalidad por las pequeñas empresas, y esta investigación describe las pruebas de estudio realizadas de forma empírica y sin un laboratorio específico. Las otras fases tienen sus propias debilidades durante su proceso, que se ponen de manifiesto en el análisis de los datos. Se propone mejorar el proceso de producción de yeso, la organización y la distribución mirando a una reingeniería y tecnificación industrial en su producción, mediante el análisis de cómo muchas empresas locales trabajan en esta actividad.

Production levels, Plaster production process

Niveles de producción, proceso de producción de yeso

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Introduction

In recent years, the production of gypsum has increased in the municipality of Sucre due to various factors such as the growing demand in construction, and the initiative of manufacturing enterprises in the production of gypsum.

Therefore, the present investigation seeks to corroborate in determining the levels of production that exist in district 2 of the Municipality of Sucre, made up of the exit area to Cochabamba and adjacent places, determining how many micro-enterprises exist, how much production is, what machinery they use. And what workforce do they have?

Currently, the exit area to Cochabamba has the main supplying micro-enterprises of the Municipality of Sucre, so it is pertinent to see the industrial technification to which it is projected by having 37 gypsum quarries that exist in the province of Poroma, a direct neighbor. of the Oropeza province.

This factor is conducive to the exploitation of limestone in its different varieties and types, which are mostly brought from Poroma; Milluni, Piosera, Pojpo, main places of extraction of the raw material.

The production of gypsum involves the processes of dehydration or calcination, crushing or crushing, grinding, bagging, presentation, study tests, storage, etc. These phases are not completely carried out by the micro companies, which is why the present investigation describes that the study tests that are carried out are empirical and there is no specific laboratory for this study. As well as the other stages, they have weaknesses in the extended process in data analysis.

Background

Currently there are articles in Correo del Sur, referring to the gypsum quarries that the department of Chuquisaca has in the Province of Poroma, and some reports on proposals to improve gypsum production in certain companies in the Municipality of Sucre, without contemplate the evolution of the production of the manufacture and commercialization of the plaster at general, specific levels.

And with respect to this year, no proposals or investigations have been made on the subject, as well as there are no statistical data regarding the production of reliable plaster.

At the Bolivian level, it can be said that it has 92 deposits of gypsum or hydrated calcium ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) located mainly in the altiplano region and the sub-Andean belt, mainly exploited in the department of La Paz.

It was evidenced that there is an investigation of the Carolina plant in the library of the business administration career regarding the Carolina plaster company regarding the increase in plaster sales, and other directed works that collaborate with the investigation to carry out this management.

Methodology

Materials and methods

The diagnostic study, to carry out this research, was carried out in five different stages:

First to stage: started from the documentary, theoretical, methodological review of the production of plaster in district 2 of the Municipality of Sucre.

Second stage: it started from the determination of the population and sample; and the elaboration of diagnostic instruments, interviews whose instrument will be the interview guide, the application of the observation guide, and the application of the survey, these instruments will allow qualifying and quantifying the information that is intended to be collected.

Third stage: It started from the application of the instruments to the population of workers, owners and administrators of micro-enterprises related to the production of plaster in the Municipality of Sucre.

This is how the application of empirical methods is executed, such as: the survey, the observation, the interview with its instruments:

- Interview guide.
- To survey guide.

Fourth stage: Throughout the entire investigative process and in its different stages, the following theoretical methods were used to structure the research, such as:

- Historical-logical method.
- Inductive-deductive method.
- Systemic method.
- Method analysis and synthesis.

That will allow to study the problem to analyze all the information regarding the production of gypsum in district 2 of the Municipality of Sucre in this way will allow to build the structure of the final report.

With the use of statistical methods, inductive-deductive, we proceeded to the analysis and interpretation of all the information obtained from the application of instruments and the elaboration of statistical graphs.

Fifth stage: We proceeded to the organization and elaboration of the final report of the investigation that will contemplate all the data obtained in the diagnosis to determine the levels of micro-enterprise production from the phases of gypsum production through the quantitative descriptive method in District 2 of the Municipality of Sucre 2012. Once the presentation of the report has been analyzed, it is prepared for the presentation and socialization of the research carried out.

Poblation and sample:

Población	Muestra
5 microempresas	5 microempresas
5 propietarios	5 propietarios
65 trabajadores	50 trabajadores

Table 1

Results and discussion

Results obtained

Analysis of the interview aimed at managers and owners of micro-enterprises producing gypsum

The present work starts from the following objective that it seeks: To identify the main characteristics of the gypsum production of district 5 of the city of Sucre from the exploitation of limestone.

The interview was conducted with 5 different owners of plaster factories and they responded as follows:

1. Since when have you been engaged in this activity?

Empresa	Tiempo
Yesería Gomes	12
Yesería San Martín	5
Yesería Juan Pablo	8
Yesería Carolina	9
Yesería Jerusalén	10

Table 2

They said that they dedicate themselves to this activity between 5 and 12 years of work experience.

2. How many people work in this business?

Empresa	Trabajadores
Yesería Gomes	16
Yesería San Martín	8
Yesería Juan Pablo	10
Yesería Carolina	13
Yesería Jerusalén	15

Table 3

Within each company the workers are varied according to the company that has its own extension and objectives of each employer.

The workers vary between 8-16 people. If the company is small, then the workers are smaller, as in the case of the "San Martín" plasterwork, if the company is large, then the workers are also more numerous because it requires more investment and movement of the company when producing.

In addition, the workers are in different positions, each of which the workers are in the extraction, in the company's plant and others in the distribution and marketing of plaster.

3. What is the raw material used?

The raw material used in the five gypsum producers is "limestone" or called "gypsum stone" which is the raw material for the production of gypsum which is brought from the town of Poroma and the centers of: Milluni, Piosera, Pojpo.

4. What are the main stages or phases of gypsum production?

The majority responded that they are: extraction, calcination, the crusher or crusher, grinding, bagging, storage and marketing. The test of studies is carried out empirically.

5. How much production do you get monthly?

Empresa	Producción de yeso
Yeseria Gomes	3 mil bolsas
Yeseria San Martin	2mil bolsas
Yeseria Juan Pablo	2 mil bolsas aprox.
Yeseria Carolina	3 mil
Yeseria Jerusalén	3 mil bolsas aprox.

Table 4

The amount of production varies from each company because some companies produce more and others less depending on the capacity of each producing company.

6. How long does the gypsum production process take from the extraction of limestone?

Empresa	Tiempo
Yeseria Gomes	2 a 3 días
Yeseria San Martin	2 días
Yeseria Juan Pablo	2 días
Yeseria Carolina	2 a3 días
Yeseria Jerusalén	2 a 3 días

Table 5

The gypsum production process takes place over 2 to 3 days, during which time the crushing, grinding, and grinding are prepared and then bagged.

7. What processing machinery do you have installed?

Empresa	Maquinaria
Yeseria Gomes	Maquinaria pesada, maquinaria a diesel como (, chancadora, moledora, trituradora), horno quemador, palas, otros.
Yeseria San Martin	A electricidad (Moledora, chancadora, trituradora), transporte para hacer movimiento del producto, hornos quemadores a gas natural. etc.
Yeseria Juan Pablo	A diesel(Trituradora, moledora, chancadora, horno quemadora)
Yeseria Carolina	A electricidad están instaladas sus maquinarias (molino, trituradora, chancadora) y el horno quemadora es a gas natural.
Yeseria Jerusalén	Maquinaria pesada a diesel (moledora, chancadora, trituradora.) horno quemador a gas natural.

Table 6

Thes machinery does not vary from company to company because they all have the same machinery installed, it only varies that some companies have electricity installed and others have diesel.

8. What are the difficulties you are going through to produce plaster?

Empresa	Dificultades
Yeseria Gomes	Camino carretero que no se encuentra en buen estado para el traslado de la materia prima.
Yeseria San Martin	La infraestructura no es adecuada, amplía el transporte y la carretera.
Yeseria Juan Pablo	Transporte, camino carretero.etc.
Yeseria Carolina	Camino carretero para traer la piedra caliza hasta la planta.
Yeseria Jerusalén	El camino carretero para el traslado de la piedra caliza hasta la planta.

Table 7

Most of the companies go through the same difficulty that is the highway to be able to bring the raw material to the plant because the highway is not in good condition, especially in the rainy season, which makes it difficult to transport this raw material for production. plaster production.

9. How is the crushing and grinding process carried out in the production of plaster?

The crushing and grinding process in the plant of each company through the machinery that they have installed for each phase of the production within the plant of each plaster production company.

Empresa	Proceso
Yeseria Gomes	El proceso se realiza a través de las maquinarias
Yeseria San Martin	Se realiza en la planta en las maquinarias
Yeseria Juan Pablo	Por fases que son la quemada, la chancación, trituración, la molienda,
Yeseria Carolina	La calcinación ó quemada, la chancación, la molienda
Yeseria Jerusalén	Se realiza en la planta en las maquinarias que existe instaladas.

Table 8

10. How is product quality determined?

Empresa	Calidad de producto
Yeseria Gomes	Empíricamente
Yeseria San Martin	Empíricamente
Yeseria Juan Pablo	Empíricamente
Yeseria Carolina	Empíricamente
Yeseria Jerusalén	Empíricamente

Table 9

Tests are carried out, prepared from the first grinding of the plaster mixed with water and plastering to the wall all and others observed the color of the grinding.

11. What advantages or disadvantages do you find in gypsum production in the Municipality of Sucre?

Empresa	Trabajadores
Yeseria Gomes	No. Solo hay desventajas como los impuestos y la competencia
Yeseria Martin	No hay ventajas
Yeseria Pablo	No se dice eso.
Yeseria Carolina	No hay ventajas ,más bien hay desventajas para la empresa
Yeseria Jerusalén	No sé.

Table 10

The entrepreneurs of the municipality of Sucre of the production of plaster explain that there are no advantages for their companies, rather instead of advantages they have disadvantages such as government taxes and competition in an illegal way, and the bad ideas of comments against the companies.

12. How is the distribution of the product to the agencies carried out?

Empresa	Trabajadores
Yeseria gomes	Mediante los transportes de distribución de la empresa.
Yeseria san martin	2 personas encargadas con un solo camión.
Yeseria juan pablo	La empresa tiene la distribución mediante los trabajadores encargados para eso.
Yeseria carolina	La empresa distribuye de 2 maneras: en la planta y en las agencias.
Yeseria jerusalén	

Table 11

The distribution of the plaster product is carried out by distributor transport with the people in charge who collect it from the plant and transfer it to the agencies of the same company. For later distribution to customers who prefer this product.

13. Is there government support for this sector?

Empresa	Trabajadores
Yeseria gomes	No existe nada
Yeseria san martin	No existe
Yeseria juan pablo	No existe
Yeseria carolina	No existe nada porque es una empresa privada.
Yeseria jerusalén	No conocemos nada

Table 12

For gypsum producing companies there is no government or other support because these companies are private and do not depend on anyone.

14. Do they have any training constantly or occasionally?

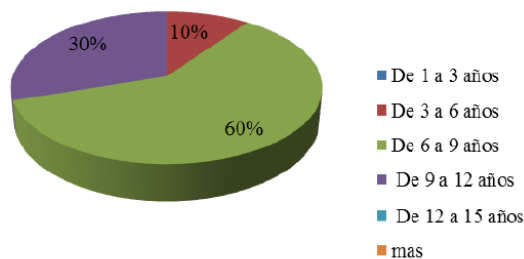
Empresa	Trabajadores
Yeseria gomes	No, los trabajadores ya tienen experiencia.
Yeseria san martin	Los trabajadores ya saben trabajar empíricamente
Yeseria juan pablo	Cada trabajador ya están preparados para sus funciones
Yeseria carolina	Los trabajadores ya saben y tienen conocimiento del trabajo que realizan
Yeseria jerusalén	Ya están preparados.

Table 13

Training for these companies is no longer adequate because a work experience gained enough knowledge the workers already have empirically so that they can work in the different companies.

Analysis of the surveys applied to workers in the production of plaster

1. Working time



Graphic 1

In this graph it can be seen that 60% of the workers have an experience of between 6 to 9 years of work, 30% of the workers have between 9 to 12 years and 10% between 3rd 6 years of experience.

2. Gypsum production per month



Graphic 2

In this graphic it can be seen that 26.92% of the production is carried out by Yesería Jerusalem, and 23.08% of plaster production is carried out by Yesería Gomes, 19.23% is made by Yesería Carolina, fourth and fifth place is shared by Yeserías San Martin and Juan Pablo with 25.38%.

3. Difficulties faced by companies in the production of plaster



Graphic 3

It was possible to identify that the main difficulty that workers go through is the dust that affects their health with 40%, also with 20% it was possible to see that another difficulty is occupational safety, it can be seen that 20% they are the environments and similarly with 20% it is also the highway for the extraction of the raw material.

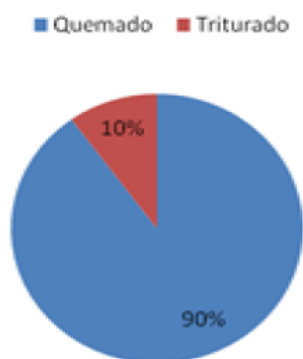
4. Main machinery for plaster production

In the present investigation it was identified that the main machinery that the plasterworks have are:

- Heavy machinery.
- Burner furnace.
- Crusher/Crusher.
- Grinder.
- Transport.

They are the ones mentioned and identified by both owners and respondents.

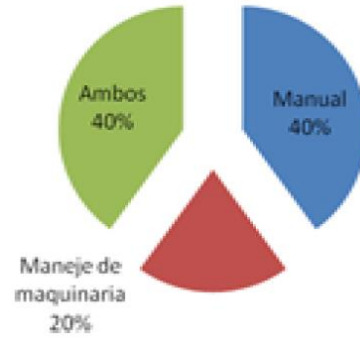
5. Most complex stage of plaster production



Graphic 4

In this graphic it can be seen that the most complex stage of production is burning with 90% of the responses and 10% mentioned is grinding or crushing.

6. Type of work carried out in the production of plaster



Graphic 5

In this graphic it can be seen that 40% of the workers mention that the type of work they do is both manual and machine operation. Similarly, the other 40% perform empirical or manual work, 20% do it in the management of industrial machinery.

Discussion

After the application of the empirical instruments, it was found that the gypsum production process is artisanal and semi-industrial, also that the most complex stage in production is calcination because there is no oven for drying and dehydration by temperature and time, but it is manual, as well as bagging and distribution, another aspect of analysis is that a laboratory study is not carried out to know the quality of the product, but the study is empirical, it is highlighted that the workers mostly have experience, but they do not have job security and this is related to the low prices of plaster in the local market.

Since, unlike international prices, it is very cheap. In the present investigation, we start from the hypothesis "the levels of micro-enterprise production do not reach all the phases of gypsum production in District 2 of the Municipality of Sucre", in which it can be identified that the level of production of district 2 in Regarding the elaboration, production of the plaster is semi-industrial and artisanal and currently the entire process is not fulfilled, there are greater weaknesses in; laboratory tests, bagging and calcination or dehydration.

An outstanding aspect of the research is the improvement in terms of machinery, the main machinery that the plasterworks have are:

- Heavy machinery.
- Burner furnace.
- Crusher/Crusher.
- Grinder.
- Transport.

They are the ones mentioned and identified by both owners and respondents. What is of concern in the present investigation is the little support that exists on the part of the municipal and departmental government, in terms of technical, logistical support that promotes the economic policies of industrial development for this area, despite the interviewees stating that they contribute from more than ten years paying taxes for the extraction of limestone, gypsum or (calcium sulfate dihydrate: $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$).

Currently, there is no evidence of the existence of articles referring to production or statistical data that are oriented to the specific production of gypsum and some producers do not want to provide data regarding the subject, so they think that their labor source can be taken away from them.

Conclusions

After conducting this research, the following conclusions can be reached:

These characteristics of gypsum production include transportation, grinding, calcination or burning, followed by crushing or crushing, then grinding.

It was possible to identify that the production of plaster in district 5 of the city of Sucre is not very technical and still empirical.

We conclude that the main machinery they use is the oven, the crusher, the grinder, mainly heavy equipment has not yet been installed and no laboratory tests are carried out, the tests to see the quality level of the plaster is empirical.

The main supplier of limestone "gypsum stone" is Milluni and the Poroma sector supplies all the plasterwork of district 2 of the city of Sucre.

For the production of plaster there are approximately between 8 and 16 workers.

All the plasterworks produce and distribute this product and have several branches in different sectors of the Municipality of Sucre.

The exploitation time that the different companies have is from 5 to 12 years and depending on the time they have a vast expansion and distribution of this product.

The age of the asylum workers is between 6 and 9 years old in the majority.

The type of work carried out in the production of plaster is largely mixed and manual by the workers.

Recommendations

The following suggestions are made:

It is necessary to carry out research regarding the production of gypsum at the Sucre level, contemplating the different districts of Sucre.

Another relevant investigation would be to determine the amount of aljez or limestone that exists in Milluni and Poroma due to its supply that it may have at the local and national level to develop large-scale projects.

With respect to the gypsum producers, it is necessary that they form an association or mutual society to expand, technify with heavy machinery and make more investment before someone presents projects that in the future compete with medium production.

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References

Ezequiel A. (2002) "Pedagogical Dictionary"
Ed. Magisterio del Río La Plata". Argentina.

Gonzales Rene M. (2007) NEUgoes Economic
Geography of Bolivia. Hiscre-Bolivia,
editorial; Tupac Katari.

Gutierrez F. (2000) "Pedagogical Glossary". La
Paz - Bolivia, Publisher; Sun Gate.

Iriarte Gr. (2003) "Post Neoliberalism –
Modernism and Globalization". La Paz –
Bolivia, Editorial Universal. Ramos Pablo S.
(1988) Themes of the Bolivian Economy. La
Paz-Bolivia, editorial; Sun Gate.

ing. Geologist Rivas V. Salomón (2002) "Non-
metallic minerals, industrial rocks and gems
from Bolivia" Santa Cruz – Bolivia, 355 pages

[http://www.bolivia.com/geografiadebolivia/cap
21.htm](http://www.bolivia.com/geografiadebolivia/cap21.htm)

[www.tecnologiaslimpias.cl/bolivia/bolivia_hist
oriamin.h](http://www.tecnologiaslimpias.cl/bolivia/bolivia_hist
oriamin.h)