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WEB PAGE DESIGN TO PROMOTE INSTITUTIONAL LINKAGE, RESEARCH AND DEVELOPMENT OF PRODUCTIVE PROJECTS OF THE RAYEN COCOA PRODUCER ORGANIZATION OF THE RAYMUNDO ENRÍQUEZ EJIDO OF THE MUNICIPALITY OF TAPACHULA, CHIAPAS

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Abstract: This Teaching Linkage Unit project has the purpose of establishing a linkage agreement between the Faculty of Administration Sciences, Campus IV, UNACH and the social organization of cocoa producers “RAYEN” of the Ejido Raymundo Enríquez of the municipality of Tapachula, Chiapas. With the linkage agreement, spaces and opportunities are opened for agribusiness students to strengthen their professional skills in carrying out field practices in agribusiness and Web page design. During the academic year August - November 2022, 4 field visits will be carried out with the organization of cocoa producers. The first visit was the institutional presentation protocol and teaching linkage unit project and establishing the linkage agreement; In the second visit, groups of students were organized to take tours in cocoa orchards, they carried out environmental sanitation work with the removal of polluting inorganic solid waste from cocoa orchards and classification; On the third visit, agribusiness practices were carried out where the students participated in cocoa bean fermentation processes with the quality standard of the international market; On the fourth field visit, the students carried out agribusiness practices in the process of making chocolate bars, packaging, packaging and distributing them for sale to different markets. It was also the presentation of the WEB page to the producer organization to promote institutional linkage, research and development of productive projects.

Keywords: linking, fermentation, agribusiness, chocolate, WEB page.

INTRODUCTION

In recent years, cocoa cultivation has spread in countries that have a humid tropical climate and are located in the regions of Central America, South America, West Africa and Mexico, mainly in North America.

Currently the main cocoa producing countries are located in West Africa.

Range	Country	Tons (Thousands)
1	Ivory Coast	2.034.000
2	Ghana	883.652
3	Indonesia	659.776
4	Nigeria	328.263
5	Cameroon	295.028
6	Brazil	235.809
7	Ecuador	205.955
8	Peru	121.825
9	Dominican Republic	86.599
10	Colombia	56.808
11	Papua New Guinea	44.504
12	Uganda	31.312
13	Mexico	27.287
14	Venezuela	23.349
15	Togo	22.522

Table 1. Main cocoa producing countries worldwide in 2019.

(Ruben, 2022).

The cocoa producing regions in Mexico are the state of Tabasco 68%, the state of Chiapas 31% and 1% between the states of Oaxaca, Guerrero and Veracruz. (Flores, 2017).

The cocoa producing regions of the state of Chiapas are the north of Pichucalco, the jungle region and the Soconusco region.

In the first half of 2021, cocoa imports averaged \$54 million to supply the national market and because production is insufficient to supply the country's chocolate industry. (Department, 2023).

The main function of cocoa production in different regions of the country is to supply cocoa beans as raw materials to the chocolate industry and currently in the Soconusco region of the state of Chiapas, low production yields of 250 to 250 per hectare are recorded. 300 kilograms of cocoa and it is due to the absence of applied research, investment in irrigation infrastructure, presence of pests and diseases and lack of technical assistance

in cocoa orchards (López, 2023).

Due to this situation, several cocoa producers have joined together and formed the Rayen producer organization to improve the growing conditions in their sustainable cocoa orchards, cocoa fermentation, improve marketing channels and a better level of well-being of the Raymundo Enríquez ejido in the municipality of Tapachula, Chiapas (RAYEN, 2023).

The general objective is to design a Web page to promote institutional linkage, research and development of productive projects of the organization of cocoa producers RAYEN of the Raymundo Enríquez ejido of the municipality of Tapachula, Chiapas.

LITERATURE REVIEW

Pablo Fidel Álvarez Olea. October 2020, Heredia Costa Rica. *Cocoa as a Development Alternative in Central America: An Analysis from the Value Chains Perspective.*

The theoretical framework presents an analysis of the cocoa activity that is carried out from the approach of global commodity chains, which is complemented with different theories of international trade, which can guide in the identification and definition of competitiveness strategies, and in specific in the analysis of the proposed alternatives: cocoa for the conventional/mainstream market, cocoa with sustainability certifications, fine cocoas and others.

The methodological framework presents the global methodology of the research work, as well as the methodology to achieve the specific objectives.

The research route: i) characterize the cocoa sector through an analysis of the cocoa chain, considering at least 2 countries in the region (Nicaragua and Guatemala), and through a comparative analysis highlight similarities and differences; ii) once the characterizations for the 2 countries have been obtained, identify development proposals for the activity and in

particular for small cocoa producers, in each of the countries, considering the conceptual approaches and the opinion of actors in the chain and experts. The work methodology was a review of secondary sources, and field studies carried out by the student at the end of 2016, complemented with new interviews with key actors in the sector in the Region during 2018 and 2019 and experts in rural development policies at the level of Latin America.

This is a descriptive analysis of the sector in each country, identifying the articulations/chains present; A comparative analysis between the countries allowed the understanding of the limitations, since it made it easier to dimension them in relation to other contexts. The descriptive research was combined with an explanatory study in that it sought to relate the results found in the descriptive part, with limitations and challenges for a greater development of the activity for cocoa producers, and to identify possible alternatives for its improvement that fuel proposals of policies for the sector. (Álvarez, 2020).

Theoretical framework. They develop taxonomy of cocoa (*Theobroma cacao*): stem, root, leaf, flower, fruit, seed, varieties of cocoa (criollo, forastero and trinitario). They analyze agroclimatic factors (climate and altitude, precipitation, temperature, winds, altitude, luminosity, shade, soils, drainage, soil pH, organic matter, topography).

Descriptive research. In propagation system. Cocoa grafting, grafting process, execution of the graft and types of grafting, breast-to-breast grafting, approach grafting, crop establishment. Research on fertilization, pests and diseases of cocoa.

Descriptive research in different phases of post-harvest cocoa pod handling: pod splitting, shelling, fermentation, drying, storage. Methodological description of manufacturing cocoa-based products: cocoa liquor, cocoa powder and cocoa butter (Mejía, 2017).

RESEARCH METHODOLOGY

To achieve the general objective set, field activities were carried out with agribusiness students using the qualitative method, exploratory scope and participatory observation technique “The researcher has an active role within the investigated context. His immersion makes it easier for him to observe in depth” (Trujillo, 2019 p. 67).

INTERVIEW WITH COCOA PRODUCERS	
Objective Compile information on cocoa promotion, marketing and productive projects to improve partners' cocoa orchards.	
QUESTIONS	
1	What were the reasons for establishing the RAYEN organization?
2	How do you obtain resources for facilities and process cocoa fermentation?
3	Clients who have a commercial contract for the sale of cocoa?
4	How do producers benefit from the sowing life program?
5	What productive projects are you managing to improve cocoa orchards?

Table 3. Interview design with managers of the RAYEN organization.

INTERVIEW WITH COCOA PRODUCERS	
Objective Compile information on conditions of exploitation of cocoa orchards and expectations of the RAYEN organization.	
QUESTIONS	
1	What work do you do to combat pests and diseases that affect the harvest?
2	What tasks do you do to increase production yields?
3	Why is there garbage of inorganic solids in cocoa orchards?
4	What activities do you do to keep your cocoa garden clean?
5	What benefits have you received from the sowing life program?
6	What are the benefits of your organization?

Table 4. Interview design with producers of the RAYEN organization.

To apply interviews, sample size (n) was determined with a finite population formula, confidence level $Z^2 = 1.96$ and population $N = 27$. (Fisher, L., 2010 P. 58).

RESULTS

On 08/19/2022, it was explained to the directors of the RAYEN organization to design a WEB page to strengthen institutional links, carry out sanitation and classification tasks to students.

ACTIVITIES	FINDINGS
Presentation of the Teacher Liaison Unit project with directors of the RAYEN organization.	Students were organized to tour cocoa orchards.
	Students were organized to carry inorganic solid materials.
Students prepare to take tours in cocoa orchards.	Students collect inorganic garbage with toxic components in cocoa orchards (Álvarez, L. and Gayou, J., 2012 P. 103).
	Instead of collecting, students classify solid inorganic garbage components.

Table 5. Record of data obtained from RAYEN organization interviews



Image 1. Students are organized for tours in cocoa orchards

Orchards	Total	%
1	214	26%
2	182	22%
3	126	15%
4	159	12%
5	131	17%

Table 7. Degree of contamination of inorganic waste in orchards

Dates	Activity	Objective
19/08/2022	Presentation of the Teacher Liaison Unit project with directors of the RAYEN organization.	Explain to directors of the RAYEN organization that agribusiness students can carry out environmental sanitation work, conduct interviews and design a WEB page to strengthen institutional links.
	Take tours in cocoa orchards.	Transportation and collection of inorganic solid contaminants.
	Classification and registration of data on inorganic solid materials.	Determine statistics of components of inorganic solids extracted from cocoa orchards.
30/09/2022	Organize groups of students to carry out cocoa bean fermentation practices.	Participate students in fermentation processes and obtain good quality beans in aromas and flavor to sell at a better price.
	Organize students in Gourmet chocolate making practices.	Participate students in the fermentation process to obtain better quality cocoa beans for Gourmet chocolate, as agribusiness.
	Interview with RAYEN organization managers.	Determine: background, objectives and future development projects of the organization.
14/10/2022	Apply interviews to producers of producer organizations.	Determine statistical data on planted area, production yields, crop costs, technical advice, irrigation system and other data.
20/10/2022	Meeting with directors of the RAYEN organization on the WEB page	Strengthen inter-institutional links to promote research, social service, training for producers, market advice and others.
28/10/2022	Organize activities to upload WEB page to Facebook	Public institutions and the general public have access through the WEB page to learn about the actions carried out by the RAYEN organization.

Table 2. Planning of qualitative, exploratory research and participatory observation activities



Figure 1: Inorganic base data in boxes

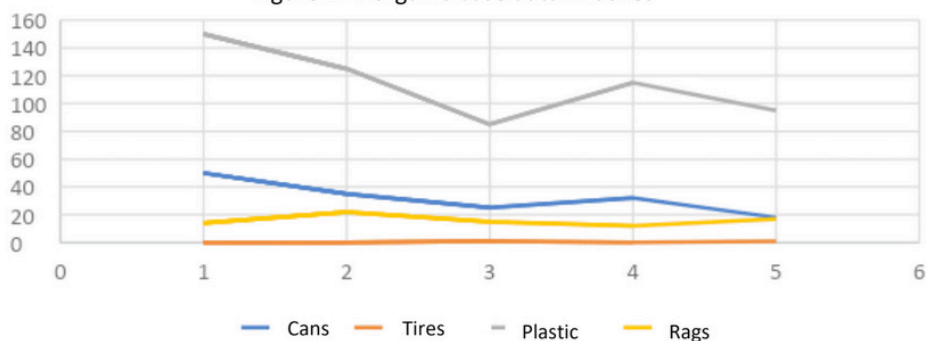


Image 2. Students in environmental sanitation practices in cocoa orchards

	ACTIVIDAD	FINDING
30/09/2022	Organize groups of students for cocoa fermentation practices.	The students carried out cocoa fermentation practices and obtained beans of better quality in flavor, aroma and lower acidity when making chocolate. (Cubillos, 2008).

Table 8. Groups of students in fermentation practices dated 09/30/2022.



Image 3. Students in cocoa fermentation practices.



Image 4. Students practicing Gourmet chocolate making



Image 5: Interview with employees of the company.

ACTIVITIES	FINDINGS
Students are organized to participate in the process of making Gourmet table chocolate.	The students learned the competency of the process of making Gourmet table chocolate as an agribusiness.

Table 9. Students in Gourmet chocolate making practices.

ACTIVITIES	FINDINGS
The teachers interview the president of the organization.	In question 1. Low cocoa prices and decline in the level of well-being of producers. In question 2. They receive financial support from an international organization for cocoa fermentation installation. In question 3. They are clients from the United States, Canada and other countries. In question 4. Producers who have 2.5 benefit from the sowing life program. hectares or more. In question 5. Projects under management to expand facilities for cocoa fermentation, training of producers and expand cocoa concentration network, reactivate irrigation system and agroindustrial project with greater added value.

Table 10. Interview with the president of the RAYEN organization.

ACTIVITIES	FINDINGS
The students interview 5 sample size producers in cocoa orchards.	In question 1. Most of them make shadows in their cocoa garden. In question 2. The partners prepare compost as fertilizer. In question 3. Most orchards are contaminated by the rising river and throw inorganic solid garbage. In question 4. The partners carry out environmental sanitation and valuable help in the work of the university students. In question 5. Producers with an area of 2.5 hectares receive support. In question 6. The benefits consist of organic certification of the cocoa orchards and a better market price.

Table 11. Interviews produced by the RAYEN organization, dated 10/14/2022.

ACTIVITY	FINDINGS
Use of ICT tools to design WEB page design.	A WEB page was designed with specific sites of interest.
Define date and time with the president of RAYEN to visit the organization's facilities.	A meeting of participating teachers of the UVD project and president of the organization was held to expose the WEB page.
A projector and a Lap Top computer are used to project the WEB page.	The teachers presented the WEB page to the RAYEN organization of the Raymundo Enríquez ejido in the municipality of Tapachula, Chiapas.
Explain the importance of the WEB page to the RAYEN organization	Strengthen inter-institutional links to promote research, social service, training for producers, market advice and others.

Table 12. Meeting with directors of the RAYEN organization on the WEB page, dated 10/20/2022.

ACTIVITIES	FINDINGS
A meeting was organized with directors of the organization to deliver the WEB page.	Web page design was delivered to promote institutional linkage in research, social service, irrigation infrastructure, productive projects and training for the benefit of the organization (Basure, 2022). https://vinculacion-universidad-y-productores-de-cacao-de-chiapas.webnode.mx/

Table 13. Deliver the WEB page to the producer organization and upload it to Facebook, dated 10/28/2022

CONCLUSIONS

The following conclusions are established as results of field research of the Teacher Liaison Unit project.

The main cocoa producing countries are Ivory Coast, Ghana, Indonesia, Nigeria and Cameroon with 60% of world production.

The cocoa producing states of the country are Tabasco 68%, Chiapas 31% and Oaxaca, Guerrero and Veracruz 1% and the producers of the RAYEN organization from the municipality of Tapachula have improved techniques in orchards for export, taking advantage of market niches.

In the first half of 2021, cocoa imports of \$54 million were recorded to supply the chocolate industry in the national market.

The conservation of sustainable cocoa orchards with environmental sanitation work by agribusiness students from the Faculty of Administration Sciences of Campus IV, UNACH.

The students carried out cocoa fermentation practices to obtain beans of better quality and a better market price.

During the rainy season, garbage carrying inorganic solids that contaminate the cocoa orchards is recorded, and in environmental sanitation, 160 cans, 2 tires, 570 plastics and 80 cloths are transported, with a total of 812 inorganic solids.

The drop-in product prices and lack of support for the crop was the main cause of

establishing the organization to improve marketing channels and management of external support and improve crop conditions.

WEB page design is to contribute as a digital strategy; promote institutional linkage in research, social service, irrigation projects, productive projects, training and other

benefits of the organization.

Institutional linkage commitments were formalized with the producer organization to provide agribusiness students with social service, put their knowledge into practice and achieve professional skills.

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