

HACIENDA LA CEIBA

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GEOGRAPHIC LOCATION AND DESCRIPTION OF THE FIRM

- Hacienda La Ceiba is located in the central region of Colombia, in the department of Tolima, at 6 km of Ibagué (the capital of the department; with 500.000 inhabitants), on the side of an important national road.
- The territorial zoning plan of the city (2013) expands the urban growing limits at two kilometers from the location of the firm.
- Hacienda la Ceiba is a middle size agribusiness firm; that counts with 450 hectares. Dedicated to rice production for more than 50 years, under intensive agriculture; diminishing the vegetative cap and damaging soil structure, therefore creating pressure for over-cropping. Nevertheless the firm has had respect for the environment and biodiversity leaving patches of land for conservation in all its territory.
- The pressure on the soils has led to soil degradation, reduction in yields, and therefore productivity has decreased.



Image: Google maps.

VALUES OF THE FIRM: SOCIAL PROGRESS AND ENVIRONMENTAL RESPONSABILITY

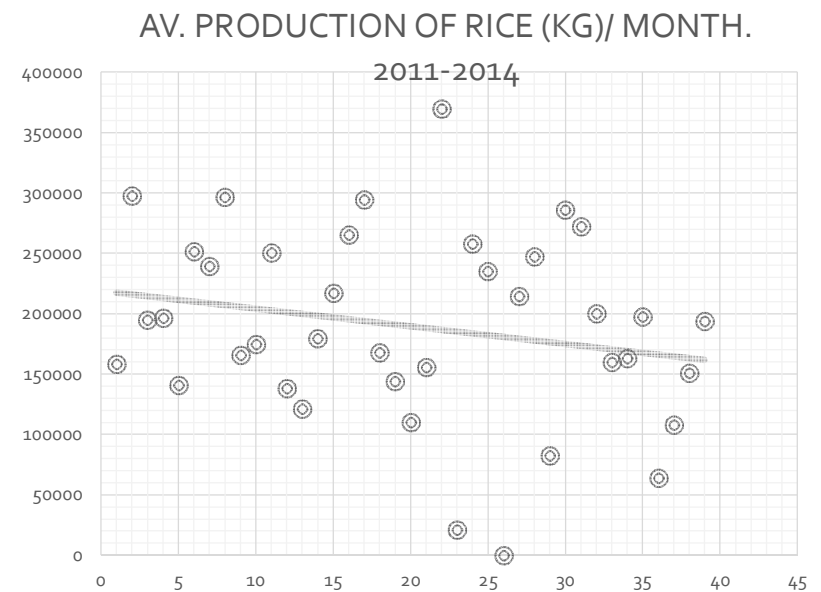
- The firm has done business in a way that can contribute with the development of the local community. The enterprise sacrifices profit to allocate more budget in labor, nowadays more than 50 employees work full time with long term contract, and their income supports more than 200 people.
- The firm has left a broad row 6 meters wide of natural vegetation, that goes along a river through all the property to regulate the water level, preserve a bird corridor and protect biodiversity. The firm has also left patches of original vegetation.
- For the last 6 years the firm is doing intercropping, establishing some hectares with agro-silvopastoral systems, and doing research to find solutions that build resilience to cope with climate change and soil degradation.



Image: Hacienda la Ceiba.

REDUCTION IN CROP YIELDS TENDENCY AND DIMINISHING PROFIT

- The intensive use of soils has diminishing its productivity and has increase production cost.
- Climate change has switched the rain patterns and the temperature range, contributing also to diminishing crop yields.
- The eco-friendly policies and social focus approach of the firm, are not sustainable under the free trade agreement era; They must compete with imports where the rice is subsidized.
- Therefore is urgent to find solutions that reverse the degradation of soils and adapt the firm activities to the new escenario in order to be a firm sustainable in time.



The average of yield/ha. for the last 40 months shows the tendency to reduction of yields . Graphic: Autor.

CHANGE THE USE OF LAND

Who from the stakeholders will be affected?

What services does the firm and its ecosystem provide?

What can be done instead, that respects the firm values?

Is the change financially liable?

STAKEHOLDERS

- The owners of the firm.
- The workers and the families that live from their income (around 200 people)
- The consumers of the rice production; given the index of rice consumption per year per capita, they would be 72.115 consumers.
- The local population, which is closely located and get the benefits of the conservation plots (cleaner air for Co₂ capture, biodiversity stocks, water regulation, landscape)



Image: Hacienda la Ceiba.

GOODS AND SERVICES OFFERED

- *Marketed Goods and Services*

1. Staple crops: Rice yield
2. Silvo-pastoral system: Beef

- *Non-marketed Goods and Services*

1. Conservation of bird corridor
2. Biodiversity
3. Pollination
4. River basin control
5. Nitrogen Fixation
6. Carbon Fixation



Image: Hacienda la Ceiba.

CHANGING THE SERVICES IN 50 HA.

Rice yields



Biodiversity and bird corridor

the land produces around 3'000.000 kg of paddy rice per year, and now is changing 50 hectares to agro sylvo pastoral system with leucaena leucocephala and cattle, which is in the first stages and therefore not yet measurable in ton. meat. On the other hand Rice is the most consumed staple food in Colombia with an average of 41,60 kg per capita (per year) 3'000.000kg this quantity will provide the rice demand per year of 72.115 consumers that in this case will be the stakeholders. The cost is done in a market basis, in which the benefits are the commodity itself and the cost is traded in the market and assumed for the stakeholders. (There's no subsidies for rice crops in Colombia)

- Biodiversity: Colombia is one of the hot spot of biodiversity, and also one of the countries located in a very important path of bird migration, many of which are now endangered species due to extensive monocropping, pollution and urbanization. La ceiba has left in between lots a corridor to preserve local biodiversity (Flora and fauna) and support the path of migrating birds.
- The stakeholders would be the society in general as biodiversity is the planetary boundary most degraded, and a very valuable as the source of gene pool. In this case the benefits are for society and the system in general, while the cost is assumed by the producer who is losing productive soil, and therefore is not maximizing its profits with no reward.

THE EXPANSION OF THE CITY – AND ITS OPOTUNITIES

The urban growing limits of the city are two kilometers away, the district that is closely located is called “El salado” and has 20.000 inhabitants, and present in the last years a fast growing tendency. This constitute an opportunity because is a non saturated market, even though most of the population in the location is low income people, it can be a business opportunity if the concept of the business is volume of people. In Ibague there are not many recreational options for low income people. Therefore the idea is to establish in one part of the firm; the closest to the city, a 50 hectares conservation focus, recreational park.



Image: google maps.

ECO- FRIENDLY RECREATIONAL PARK

- The recreational park would count with 50 hectares, the Alvarado river and the bird corridor, (which would be consider as profitable under a conservation recreational park structure as landscape). This lot has 2 artificial lakes that will be adapted to recreational purposes.
- This project will improve the soil's composition and Horizon.
- This project will go in the same way of the firm values; because a recreational park is a labor intensive service, it will maintain the existing jobs, and create more temporal ones. It will stands for respect with nature and biodiversity in an stronger way which is the other value of the firm.
- Therefore the most important stakeholders will be beneficiaries from the change.
- As a fast growing developing Country, the requirements of its people get more refined requiring more and better service sector, creating a demand and increasing the willingness to pay.



Image: Hacienda la Ceiba.

RECREATIONAL PARK: CONTINGENT VALUATION METHOD

- The surveys were made to a sample (N= 100) using the social number (which in Colombia is given according to the household income and conditions of the house) with a distribution that represented the population of the area; (low income media) the survey to the target group gave the following results:
- Future visitors of the park: 85% of the sample.
- The average and media of the willingness to pay was calculated with a result of 2.04 and 2, therefore the entrance fee is calculated with 2 USD.
- Frequency of return: 2 times per month.
- The calculation was done with visits of 80% of inhabitants of the zone, going two times per month paying two dollars. This can be seen as low bound because is ignoring people of other zones and their number of visits. That will be 64.000 USD per month in entrance fee.



Image: Hacienda la Ceiba.

SERVICES PROVIDED IN THE PARK

Besides the entrance fee there's a prognosis of future sales on the restaurant and kiosk points; in order to calculate the sales, it was asked in the survey what they will consume, and it was established a commercialization margin of profit of beverages and snacks according with the preferences and the willingness to pay: beverages 34% snacks 33% meals 13%.

If we calculate a benefit of 0.2 dollars per person in beverages purchased and a 0.4 dollars per snacks. Then we can assume only one purchase for visitor in the percentages above mentioned, then there will be a revenue for the beverages of 1.088 USD per month and of snacks of 2112 USD that means that the revenue for sales and snacks can be in the order of 3200 USD per month.



Image: Hacienda la Ceiba.

DATA USED IN THE COST BENEFIT VALUATION

- With the study in the decreasing rice yields, a regression was made, and with the factor obtained, the predictions on future sales were done.
- To establish the project the calculations were made with a credit 1'000.0000USD to five years with a nominal interest rate of 12%.
- In the first years the numbers of visits would be lower than expected, and after year two estable.
- Interest rate 12%
- Inflation 5%/year



Image: Hacienda la Ceiba.

NET BENEFITS

	Year 1	Year 2	Year 3	Year 4	Year 5
Entrance fee	\$ 621,948	\$ 806,400	\$ 846,720	\$ 889,056	\$ 933,509
Food sales	\$ 38,400	\$ 40,320	\$ 42,336	\$ 44,453	\$ 46,675
with project benefits	\$ 660,348	\$ 846,720	\$ 889,056	\$ 933,509	\$ 980,184
Fixed Cost	\$ 70,000	\$ 73,500	\$ 77,175	\$ 81,034	\$ 85,085
labour	\$ 48,307	\$ 50,722	\$ 53,258	\$ 55,921	\$ 58,717
bank credit	\$ 263,228.35	\$ 263,228.35	\$ 263,228.35	\$ 263,228.35	\$ 263,228.35
With project costs	\$ 381,535	\$ 387,450	\$ 393,661	\$ 400,183	\$ 407,031
With project net benefits	\$ 278,814	\$ 459,270	\$ 495,395	\$ 533,326	\$ 573,154
Without project Benefits					
Rice sales	\$ 2,368,283	\$ 2,344,600	\$ 2,321,153.86	\$ 2,297,942	\$ 2,274,963
Without project variable Cost					
Variable cost inputs	\$ 1,848,751	\$ 1,941,189	\$ 2,038,249	\$ 2,140,161	\$ 2,247,169
Gross margin	\$ 519,531	\$ 403,411	\$ 282,905	\$ 157,781	\$ 27,794
Fixed Cost	\$ 48,306.53	\$ 50,721.85	\$ 53,257.95	\$ 55,920.84	\$ 58,716.89
Without Project Net Benefits	\$ 471,224.68	\$ 352,688.95	\$ 229,647.41	\$ 101,860.55	-\$ 30,922.97

* The values were calculated in USD, with exchange rate of 1.951 Colombian pesos to 1 dollar. Table: Autor

ECONOMIC NET PRESENT VALUE

INCREMENTAL NET BENEFIT	-\$ 192,411.14	\$ 106,580.84	\$ 265,747.30	\$ 431,465.31	\$ 604,076.53
PRESENT VALUE OF INCREMENTAL NET BENEFIT (12% DISCOUNT RATE)	-\$ 192,411.14	\$ 95,161.47	\$ 211,852.12	\$ 307,108.49	\$ 383,901.56
ECONOMIC NET PRESENT VALUE (12% DISCOUNT RATE)	\$ 805,612.49				

Table: autor.

CONCLUSION

- Given the declining tendency in crop yields cultivation due to climate change effects and land degradation, the firm should diversify the risk and change in the long run its activities for others more sustainable.
- The growing limits of the city come with new business opportunities, and given that the margin of profit is always higher in the service sector, a change of the use of land (50 hectares) is recommended towards a eco- friendly recreational park
- The two mayor stakeholders are winners with the change; because the profits of the firm will rise improving the wellbeing of the owners of the firm, and the labour force of the firm can be trained for the change of work, and continue they work in the park.
- The biodiversity and the conditions of land will have a positive impact changing the extractive approach of cultivation.
- With the cost-benefit valuation made, gave as a result an economic net present value of 805,612 USD, therefore is recommended to make the change in land use towards the recreational park project.