



UNIVERSIDAD TÉCNICA DEL NORTE

FACULTY OF ENGINEERING IN APPLIED SCIENCES

TEXTILE ENGINEERING

TOPIC:

"EXPANSION OF THE FACILITIES AND INFRASTRUCTURE IN MICROENTERPRISE TEXTILES VINARDI TO INCREASE THE PRODUCTION OF FABRIC IN PLAIN WEAVE"

SCIENTIFIC ARTICLE (ENGLISH)

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IBARRA - ECUADOR

2016

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INTRODUCTION

The present report aims to encourage the study and implementation of market, technical, economic and financial studies to perform with the finest possible evaluation and feasibility criteria when making important investments in the textile area.

BACKGROUND

Microenterprise traverses a good situation both in the economic and productive; such is the case that all production that has micro dries up quickly, giving rise to the existence of an unsatisfied local demand of flat fabric (canvas) which has caused a greater waiting time in our customers to receive the product and the risk of losing them, but above all generated losses of considerable economic gains

The period covered by the investigation is from the year 2013 until 2016 in microenterprise Textiles Vinardi facilities.

GENERAL OBJECTIVE

Expand the facilities and infrastructure of the microenterprise Textiles Vinardi to increase the production of fabric in plain weave.

SPECIFIC OBJECTIVES

- ✚ Diagnose the current situation of micro-enterprises: internally (SWOT) and externally (PESTLA).
- ✚ Develop a market study to demonstrate the unmet demand for fabric (canvas) in the microenterprise.
- ✚ Carry out a technical study for the expansion of infrastructure and machinery in textile Vinardi.
- ✚ Develop the economic study on the impact on the increase of the production.

- ✚ The financial study to determine the feasibility of the project on the evaluation criteria.
- ✚ To assess the improvements obtained to arrive at the findings, conclusions and recommendations.

SCOPE

Detailed information and relevant data were obtained from the records of marketing of customers who has microenterprise in almost a decade of production activities and the results obtained before an analysis will allow expand the facilities and infrastructure of the microenterprise Textiles Vinardi to increase the production of fabric in plain weave.

PROBLEM

The drawbacks that we consider is the limited infrastructure that now count micro-enterprises where there are no large spaces of mobility and appropriate conditions in the workplace causing a decrease in productive capacity.

On microenterprise, there are also shortcomings in the adequate control of production and as a result the low use of resources.

JUSTIFICATION

If we carry out the relevant studies will be able to achieve a production optimum that you will allow us to seek new markets and reach new customers, bringing in a more technical manner the different processes with best quality, reduction of time in the delivery of orders; This will lead us to make a more profitable product, profits for micro-enterprises and utilities for investors and workers.

CHAPTER I

1 DESCRIPTION OF THE MACHINERY AND PROCESSES INVOLVED IN WEAVING

Microenterprise the starting point for the elaboration of the tissue is the enjulos Assembly already loaded with warp, is to say that both the warp and the rubber coating are contracted services to another company that is very prestigious in the Ecuador as it is the case of industry Piolera Ponte Selva S.A.

1.1 URDICION PROCESS

In the tissue the warp is the set of ordered threads folded in parallel with a default length. Warp has certain parameters:

- A certain number of total threads.
- A length of urdición.
- Color, title and torsion of the specific thread.
- Set width of warp.

The most popular systems to devise are the direct and the branch.

1.2 RUBBER COATING PROCESS

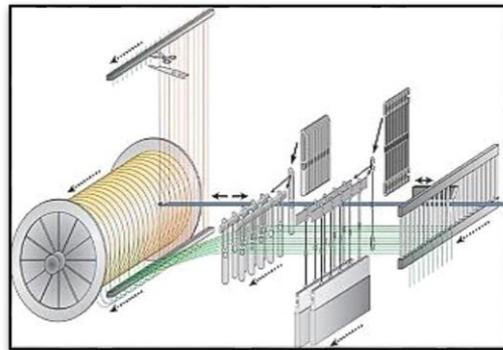
"The gluing operation consists of applying a rubber film to give added strength, security, elasticity, compaction, and uniformity in fibers and therefore to the leads. The formation of the film must be continuous and uniform to hold fibers attached, used in the rubber product is starch with the addition of lubricants and other additives such as water, resins, fats, salts, waxes, etc."¹

¹ Játiva, Washington. (2013). "Guía multimedia implementada en el aula virtual como herramienta de apoyo para la enseñanza-aprendizaje de tejeduría plana", Tesis de grado. Universidad Técnica del Norte. Ibarra, Ecuador.

1.3 PROCESS OF JOINING

The above operation can be performed when the warp not be tying with other than this ending on the loom or at the same time for not having the same features due to change of tissue or frames. A warp threads pass through lamellas, heated and comb, according to previously established distribution.

Figure 1: Flow of threads by the loom.



Source:

<http://josemaldonadoingenieriatextil.blogspot.com>.

1.4 WEAVING PROCESS

Call the industry which manufactures fabrics from yarns in general weaving. Technically it is conveniently and in accordance with an order bind the warp threads with the weft passes required to produce textiles and his final delivery is a roll of fabric.²

The stall is open throughout the period of inclusion, the clamp releases inserted plot once this has been subjected by the auxiliary selvedge and

²

<http://josemaldonadoingenieriatextil.blogspot.com/2009/12/hilatura-de-algodon.html>

later acts the batán who carries the comb to press the last pass of fabric weft. Modifying the ligament and chopped design that is raised or lowered frames are accomplished different drawings and textures.

1.5 REVIEW PROCESS

Immediately the batch of fabric produced goes to the process of revised, bending, measuring and cutting where the piece of tissue that comes out of the loom cut into rolls, agreement also to customer requirements and specifications. Each meter of fabric is inspected visually on the bending machine using the system of evaluation of 4 points.

Figure 2: Quality Control of the plain weave.



Source: [_http://josemaldonadoingenieri atextil.blogspot.com](http://josemaldonadoingenieri atextil.blogspot.com).

1.6 MATTER PREMIUM

Raw materials are considered to material extracted from nature or chemical process that turns to develop materials that will later become useful or human consumption products.

1.7 MATERIALS

A material is a set of raw materials (fibers) that can transform and grouped with the purpose of obtaining another product (wire) to then pass through a more complex process.

1.8 TISSUE FLAT

The plain weave is to weave the warp threads with frames in an orderly pattern.

Certain aspects that give their quality are controlled in a tissue, among them we can mention the following technical specifications:

- Colour fastness: wash, rub, to sweat, to the light.
- Shrinkage of tissue in both warp and weft, measured in percentages.
- Number of passes per square inch (**pt./in²**).
- Control of defects in the fabric.
- Title of warp and weft threads.
- Weight (**gr/cm²**).

1.9 DIAGNOSIS OF THE CURRENT SITUATION OF THE MICROENTERPRISE

Analyzed the current situation affecting the microenterprise both internal as external through the matrix SWOT and PESTLA applied to the textile industry and in general the biggest threat are such products that exist in the market and in our case the majority of them represent large companies well known in our country such as Cortivis, Ponte Selva S.A. , The scale; This motivates our micro-enterprise to change its way of acting on the proposal to meet a niche market with more affordable prices, offer the same product with better benefits and quality.

The main rivals of Textiles Vinardi are: Cortivis, Ponte Selva S.A., scale, these are large textile companies aiming for his way of marketing their products always sell large quantities and many times dealers (brokers).

CHAPTER II

2 MARKET STUDY

This project will focus on the production of woven 100% cotton which is well known for the makers of the province, since most of them use this textile gender to make their handicrafts and clothing.

Direct surveys will be made in today's consumers of micro-enterprises to meet their demands, with the analysis of these data will be obtained the level and frequency of consumption of both products, the degree of satisfaction of consumers in terms of prices and quality, purchase places preferred by the makers, the ability to purchase that they represent.

Also shall be verified the existence or not of the potential demand unsatisfied, with the help of a balance supply/demand and their respective projections over time.

Will be the analysis of prices on the market and a projection of the same taking into account the accumulated inflation of the Ecuadorian economy; In addition, the determination of possible marketing channels and choose the most suitable for each material.

2.1 GENERAL OBJECTIVE

The study of the market for flat-woven consumption data to determine the extent or existing percentage of unsatisfied demand of our products in the market and the acceptance or preference which we have.

2.2 RESULTS OF THE SURVEYS

After the analysis of all the tabulated information obtained from surveys targeting clients of micro-enterprises the following results are presented to consider:

- Question 1 asks about the type of fabric that use the makers and gets to all workshops, 16 in total work with plain weave.
- In question 2, it investigates about providers and its location, obtaining as relevant that 44% of the workshops only works with microenterprise.
- Question 3 which allowed us to meet the purchasing power of the manufacturers giving the values of monthly consumption of 3250 meters canvas and 3050 meters of Indian fabric.
- About question 4 met the prices of each tissue in the local market, being the cost of \$ 1.90/m for canvas and \$ 2.50/m the cost of Indian fabric.
- In question 5 the most important is that almost any supplier competition, taking into account the suggestions of customers by what is a very favorable for microenterprise.
- Referring to question 6 we highlight that customers prefer the so-called distribution channel in a high percentage "of the factory workshop", which operated the distribution of tissues in microenterprise.
- As for question 7 met the makers as buying preferences: comfortable price, excellent quality, credit per month, working directly with the factory and in terms of the presentation of the tissue easily.
- Finally, question 8 highlights 12 workshops would be willing to work with micro-enterprises if the two quilts are offered.

2.3 THE MARKET

Analysis of surveys and records of microenterprise approximately 73% of the portfolio of clients of micro-enterprises are engaged in the sale of

their textile handicrafts, and most of them are made with Indian fabric, woven and canvas.

In the city of Ibarra, there are sectors clearly engaged in the making of garments varied using the tissues that we offer. Atuntaqui, Cotacachi and Otavalo are trade centers and not get left behind have been known both nationally and internationally for its textile products exported and it is in this market where reception is given to a wide variety of costumes that are made.

2.4 QUANTIFICATION OF UNSATISFIED DEMAND

To determine the unmet demand for corresponding has been taken into account portfolio of clients of micro-enterprises located in the city of Ibarra, and potential customers who purchase mentioned tissues in the present study.

Significant values for normal canvas are presented in the year 2014 where there are 125 rolls of fabric as unsatisfied demand representing the (16.0%) of the total production.

CHAPTER III

3 TECHNICAL STUDY

It serves to make an analysis of the process of production of goods or the provision of a service. Includes aspects such as: raw materials, labor, machinery, manufacturing, investment required, size and location of the facilities plan, forms that will be organized the company and investment and operating costs.³

3

<http://emprendedor.unitec.edu/pnegocios/principal>

3.1 GENERAL OBJECTIVE

Perform an operating technical study to establish the requirements of the new facilities and infrastructure of the weaving plant.

3.2 DETERMINATION OF THE OPTIMUM OF THE MICRO SIZE

A key factor that has limited the capacity of the current plant has been the unfulfilled potential demand, in the market study was obtained by 16.0% and 12.2% woven flat canvas and hindú cloth respectively; He is expected that in the period to 2014 to 2017 production will absorb between a (81% and 89%) of the potential demand, all these values are taken from the results of the market study.

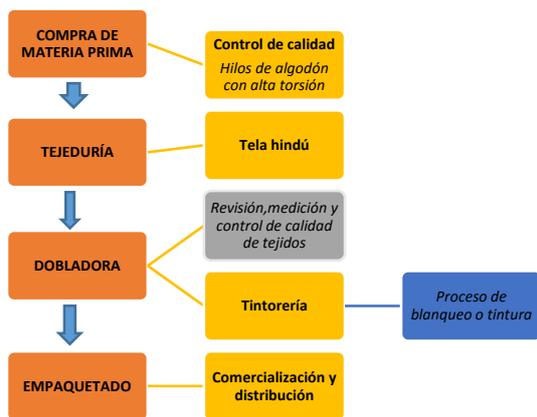
It notes that the installed capacity of the plant for the manufacture of flat-woven is 64.896 meters per year, which represents an average of 104 meters per day.

It is estimated that in the year it will work 312 days approximately with which the year 2014 aims to increase the production at least 1,478 rolls of tissue, to meet the demand in the market, in other words, we will raise production by 13.91%.

3.2.1 THE PRODUCTION OF WOVEN FLAT CANVAS NORMAL PROCESS DIAGRAM

In the diagram below we present the simplified process compliant micro-enterprises for the production of this flat-woven, it should be noted that previously outlined some key aspects that we must bear in mind prior to the fulfillment of the diagram of process of the canvas.

Chart 3: Diagram of Indian fabric process.



Source: Microenterprise Vinardi.

3.2.2 SELECTION OF MACHINERY INVESTMENT

Technical specifications presenting machinery selected part of being a very versatile German origin machine, its working range is up to 240 cm fabric width, the production speed is 250 beats/min, is incorporated with a chopped Dobby razor stäubli for control of 24 frames, is also equipped with 4 coils of plot.⁴

Chart 4: Dornier weaving machine.



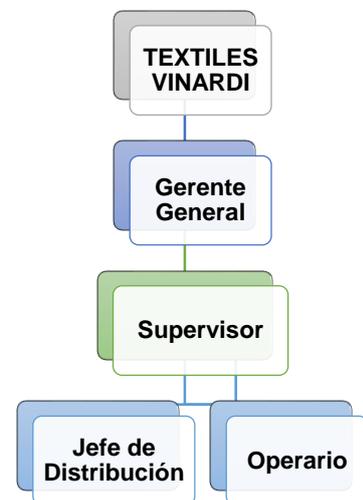
Source: <http://www.exapro.es>

3.2.3 INVESTMENT IN THE INFRASTRUCTURE

Budget detailed below, the most relevant information is that micro-enterprise provides with 35% of the entire investment for the project and the remaining 65% was acquired through funding sources.

Investments within this fixed the purchase of furniture and appliances listed in the table, in addition to this also takes into account deferred investments such as the training of staff and operating costs of constitution or pre.

Chart 5: organization chart.



Source: Micro Vinardi.

CHAPTER IV

4 STUDY OF ECONOMIC EVALUATION

Economic and financial project study refers to different concepts, however, is a process that seeks to obtain the best alternative using universal criteria that allow to compare positive flows (income) with negative flows (costs) that generates the project throughout its

⁴ <http://www.exapro.es>

useful life, the purpose of optimally allocating financial resources.⁵

All this serves to make important decisions:

- The investment decision.
- The financing decision.

4.1 GENERAL OBJECTIVE

Determine the profitability of the project "Expansion of the facilities and infrastructure in microenterprise Textiles Vinardi to increase the production of fabric in plain weave", on the local market through an economic evaluation study.

4.2 DETERMINATION OF COSTS

Production costs comprise costs of raw material, materials indirect, consumption of electricity which is based on the use of machines, consumption of water, direct and indirect labor cost that will be incurred in the maintenance of machines besides other also significant costs such as: fuel, testing, quality control, hygiene and safety equipment, all referred to the production area.

4.2.1 OPERATING EXPENSES

Operating expenses include all expenses above including: administrative expenses, distribution costs selling and financial expenses.

48 table reflects the sum of all operating costs required to set up the new facility during the projected period of operation which will take the micro-enterprise, as we can see in the first year will be \$ 97.208,50.

4.3 BALANCE POINT (PEQ)

The point of equilibrium (PEQ) is the level of production in which the benefits

from sales are exactly equal to the sum of the fixed costs and variable.

The calculations were carried out to find the point of balance of both products, and the following formula allows us to know the point of balance in units produced:

PEQ in physical units:

$$PEQ(U) = \left[\frac{\text{Costos Fijos X Unidades Producidas}}{\text{Ventas Totales} - \text{Costos Variables}} \right]$$

For the calculation of the point of balance in monetary units, the following formula is used:

PEQ in monetary values:

$$PEQ(\$) = \left[\frac{\text{Costos Fijos}}{1 - \frac{\text{Costos Variables}}{\text{Ventas Totales}}} \right]$$

Table 1: Monetary balance of flat fabrics.

INPUT DATA		
Total sales	142.771,20	
Variable operating costs	75.270,56	
Fixed cost of operation by period	21.937,94	
Monetary equilibrium point	46.401	\$

Source: Costs and revenues of the financial study.

After having made calculations based on the formulas of the point of balance of the microenterprise was obtained that the PEQ produced meters is **21.091 meters**; and the PEQ in monetary values of operation **46.401** dollars.

⁵ <http://planificacion-de-proyectos.blogspot.com>

4.4 STATE RESULTS WITH FINANCING

Analyzing this information can know if it is generating enough income, if you're spending too much, if you are generating profits, if you're spending more than it earns, etc. and on the basis of this analysis to make decisions.

Net cash flow for the first year of operation of the plant is \$ 45.562,7 and for the last year of operation (8) \$ 81.780,1 is projected.

Table 2: Investment budget.

RUBROS	USE OF FUNDS	SOURCES OF FINANCING	
		OWN FUNDS	LOAN
FIXED INVESTMENTS	\$59.260,75	\$14.665,00	\$44.595,75
FURNITURE AND FIXTURES	\$80,00	\$80,00	\$19.425,75
Desks and chairs	\$80,00	\$80,00	
Real estate	\$19.425,75		\$19.425,75
Infrastructure	\$19.425,75		\$19.425,75
OFFICE EQUIPMENT	\$585,00	\$585,00	\$0,00
Computer	\$490,00	\$490,00	
Printer	\$95,00	\$95,00	
MACHINERY AND EQUIPMENT	\$27.170,00	\$2.000,00	\$25.170,00
Loom clamps	\$24.000,00	\$0,00	\$24.000,00
Tecele	\$150,00	\$0,00	\$150,00
Combs	\$420,00	\$0,00	\$420,00
Healds	\$700,00	\$0,00	\$700,00
Lamellas	\$600,00	\$0,00	\$600,00
Transformer	\$2.000,00	\$2.000,00	\$0,00
VEHICLES	12.000,00	12.000,00	-
Vehicle	12.000,00	\$12.000,00	
DEFERRED INVESTMENT	\$650,00	\$650,00	\$0,00
Staff training	\$150,00	\$150,00	
Permits, registrations legal	\$500,00	\$500,00	
WORKING CAPITAL	\$8.224,03	\$8.224,03	\$0,00
Matter direct premium	\$5.184,03	\$5.184,03	\$0,00
Hand direct work	\$340,00	\$340,00	\$0,00
Box	\$2500,00	\$2500,00	\$0,00
Unforeseen	\$200,00	\$200,00	\$0,00
TOTAL	\$68.134,78	\$23.539,03	\$44.595,75
		35%	65%

Source: Inventory of Textiles Vinardi microenterprise.

Table 3: Operating costs for the projected period.

PRODUCTS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
1.COSTOS OF PRODUCTION	76.137,9	79.493,6	83.015,0	86.712,0	90.595,0
Direct raw	62.208,4	64.696,7	67.284,6	69.976,0	72.775,0
Direct labor	5.255,7	5.781,3	6.359,4	6.995,4	7.694,9
Indirect costs	8.543,8	8.885,6	9.241,0	9.610,6	9.995,1
Deferred depreciation	130,0	130,0	130,0	130,0	130,0
2.GASTOS OF MANAGEMENT	6.481,2	7.129,3	7.842,2	8.626,4	9.489,1
Administrative expenses	6.481,2	7.129,3	7.842,2	8.626,4	9.489,1
3.GASTOS OF SALE	8.549,7	9.404,7	10.345,2	11.379,7	12.517,6
Sales expenses	8.549,7	9.404,7	10.345,2	11.379,7	12.517,6
4.GASTOS OF OPERATION	15.030,9	16.534,0	18.187,4	20.006,1	22.006,7
5. FINANCIAL EXPENSES	6.039,7	5.553,3	4.994,3	4.351,9	3.613,5
Bank interest	6.039,7	5.553,3	4.994,3	4.351,9	3.613,5
TOTAL	97.208,5	101.580,9	106.196,7	111.070,0	116.215,2

Source: Study finance, tables (42-47).

Table 4: Equilibrium point in meters of flat fabrics.

INPUT DATA				
Sales price per unit		2.20		
Operation per unit variable cost		1.16		
Fixed cost of operation by period		21.937,94		
Non-monetary fixed cost		0.00		Optional
Operating balance		21.091		units
Balance in cash		21.091		units
Monetary equilibrium point		46401,13		\$
Units	Income	Costs	Costs	Costs
		Fixed	Variables	Total
0	0.00	21.937,94	0.00	21.937,94
4.218	9.280,23	21.937,94	4.892,64	26.830,58
8.437	18.560,45	21.937,94	9.785,28	31.723,22
12.655	27.840,68	21.937,94	14.677,92	36.615,86
16.873	37.120,91	21.937,94	19.570,56	41.508,50
21.091	46.401,13	21.937,94	24.463,19	46.401,13
25.310	55.681,36	21.937,94	29.355,83	51.293,77
29.528	64.961,59	21.937,94	34.248,47	56.186,41
33.746	74.241,81	21.937,94	39.141,11	61.079,05
37.965	83.522,04	21.937,94	44.033,75	65.971,69
42.183	92.802,27	21.937,94	48.926,39	70.864,33

Source: Costs and revenues of the financial study.

Table 5: Result with funding status.

YEARS					
PRODUCTS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME	142.771,2	148.482,0	154.421,3	160.598,2	167.022,1
SALES	142.771,2	148.482,0	154.421,3	160.598,2	167.022,1
RESIDUAL VALUE					
Production costs	76.137,9	76.137,9	76.137,9	76.137,9	76.137,9
GROSS PROFIT	66.633,3	72.344,1	78.283,4	84.460,2	90.884,2
OPERATING EXPENSES	15.030,9	16.534,0	18.187,4	20.006,1	22.006,7
Operational utility	51.602,4	55.810,1	60.096,0	64.454,1	68.877,5
INTERESTS	6.039,7	5.553,3	4.994,3	4.351,9	3.613,5
NET INCOME BEFORE REP.UTILITIES	45.562,7	50.256,8	55.101,7	60.102,3	65.264,0
DISTRIBUTION OF UTILITIES (15%)	6.834,4	7.538,5	8.265,3	9.015,3	9.789,6
NET income before IMP	38.728,3	42.718,3	46.836,4	51.086,9	55.474,4
TAXES (25%)	9.682,1	10.679,6	11.709,1	12.771,7	13.868,6
NET INCOME	\$29.046,22	\$32.038,72	\$35.127,33	\$38.315,20	\$41.605,81

Source: Revenues, costs and operating expenses of the study finance.

CHAPTER V

5 FINANCIAL EVALUATION

5.1 RATE MINIMUM ACCEPTABLE PERFORMANCE (TAKE)

The minimum acceptable rate of return is the minimum rate of return on the investment that will be made in favor of the investor. For its calculation takes into account two factors; rates of inflation and the risk investment award, since evaluated money must change through time and at the same time must generate real profits in the present.

Table 6: Take with financing.

Rate acceptable minimum performance			
	% CONTRIBUTION	TAKE	WEIGHTING
SHAREHOLDERS	35%	17,00%	5.87%
CREDIT	65%	14.00%	9.16%
TAKE GLOBAL * /			15.04%

Source: Investigation of Bank lending rate, Textiles Vinardi.

The minimum attractive rate of return with financing is 15.04%.

5.2 NET PRESENT VALUE (VAN)

"It is the monetary value that results from subtracting the sum of flows discounted at the initial investment.

- Its value depends on the applied rate take and whose value the evaluator determines.
- The evaluation criteria are: If " $VPN \geq 0$, accept investment; if $VPN < 0$, reject it."⁶

⁶ Baca, G. (2006). Evaluación de Proyectos, McGraw-Hill, 5ta Edición.

Revenues are projected an increase related to the average growth of the inflation of the last 5 years which is approximately 4%. Projected expenses grow with 10% in the case of earnings and 4% in the case of other costs and expenses.

The results are shown in the following table and according to the calculations, the net present value with financing is \$56.203.25 \$; This value is positive and indicates that the project is profitable for all of the projected period.

5.3 RATE OF RETURN (IRR) INTERNAL

Based on the above calculations of the VAN gets to find the IRR, which is the rate by which the updated values of all revenues and expenditures are equal, i.e. that the net present value is zero.

This shows that the project is sustainable up to a rate of variation of prices and costs the **37,47%**, in the case that exceed this rate project would become non-viable, aspect that is not possible in the development of this project, so it is concluded that it is feasible and sustainable in the 8 years' period.

5.4 BENEFIT/COST RELATIONSHIP

Is a method of evaluation that takes into account the value of money over time, and mainly based on social criteria.⁷

The benefit/cost relationship gives us a value of $1.08 \cong 1$. This indicates that the company can meet all obligations in the short term (1 month) by 100%, which would not take other commitments that could generate debts for the same; that is to say that we don't need to resort to new credits.

⁷ Baca, G. (2006). Evaluación de Proyectos, McGraw-Hill, 5ta Edición.

A simpler explanation of the calculated value would be that for every dollar invested is gained eight cents.

5.5 TERM FOR RECOVERY OF INVESTMENT (PRI).

In conclusion, you can say it is estimated and necessary time so the project canceled by itself the capital that has been invested in this project. This parameter shows more clearly the liquidity of an investment, i.e., on the ease or rapidity with which goods become money.

According to the table below return on investment with financing period is 2 years, 11 months and 8 days, this guides us to the return on investment is fast which microenterprise has very good liquidity.

5.6 FINANCING OR PAYMENT TABLE

In the investment budget was achieved to calculate the amount of initial investment total is **\$68.134,78** dollars, a part of the total investment will be financed with a loan from a financial institution in the country, Cooperative Atuntaqui Ltda. at an interest rate of 14% per year and 8-year term. The loan amounts to **\$44.595,00** dollars equivalent in 65% of the financing of the total investment.

The monthly fee or dividend that microenterprise has to cancel for the concept of the credit is \$ 774,70.

In previous chapters, studies were performed to assess the condition of micro-enterprises and the situation in which carries out its operation, therefore, in this final chapter the results concerning the factors of production which will include Textiles Vinardi for the application of this project will be highlighted.

6.1 CURRENT PRODUCTION ANALYSIS

Thanks to the studies carried out, it is clear that in terms of operational capability and productivity of micro-enterprises is increased both facilities and manufacturing equipment as in the area of production and infrastructure which provides us a better current scene which from now on will be.

Has been taken into account all the shortcomings and errors described in the analysis of the current situation of micro-enterprises and given relevance to aspects such as: the optimal processes, operational capacity, workforce and quality; Since all decisions taken in the area of production are associated with them.

CHAPTER VI

6 EVALUATION OF PRODUCTION

This information is in direct relation with the basic functions that performs the weaving microenterprises flat, in order to achieve its objectives and to achieve an integral role in everything concerning her.

Table 7: Cash flow of the project.

PRODUCTS	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
INCOME	\$0.00	\$142.771,20	\$148.482,05	\$154.421,33	\$160.598,18	\$167.022,11	\$174.902,99	\$180.651,11	\$187.877,16	\$7.826,00
SALES		\$142.771,20	\$148.482,05	\$154.421,33	\$160.598,18	\$167.022,11	\$173.702,99	\$180.651,11	\$187.877,16	\$0.00
REDEMPTION VALUE LOAN		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.200,00	\$0.00	\$0.00	\$7.826,00
PRODUCTION COSTS		\$76.137,95	\$79.493,61	\$83.015,03	\$86.712,00	\$90.595,00	\$94.675,29	\$98.964,97	\$103.477,02	\$0.00
GROSS PROFIT		\$66.633,25	\$68.988,44	\$71.406,30	\$73.886,19	\$76.427,11	\$80.227,70	\$81.686,15	\$84.400,14	
OPERATING EXPENSES		\$15.030,87	\$16.533,96	\$18.187,35	\$20.006,09	\$21.006,39	\$22.056,71	\$23.159,55	\$24.317,53	
OPERATIONAL UTILITY		\$51.602,38	\$52.454,48	\$53.218,95	\$53.880,10	\$55.420,72	\$58.170,99	\$58.526,60	\$60.082,62	
INTERESTS		\$6.039,69	\$5.553,33	\$4.994,34	\$4.351,87	\$3.613,46	\$2.764,76	\$1.789,32	\$668,21	
NET INCOME BEFORE REP. UTILID		\$45.562,70	\$46.901,15	\$48.224,60	\$49.528,22	\$51.807,26	\$55.406,23	\$56.737,28	\$59.414,41	
DISTRIBUTION OF UTILITIES (15%)		\$6.834,40	\$7.035,17	\$7.233,69	\$7.429,23	\$7.771,09	\$8.310,93	\$8.510,59	\$8.912,16	
NET INCOME BEFORE IMP		\$38.728,29	\$39.865,98	\$40.990,91	\$42.098,99	\$44.036,17	\$47.095,29	\$48.226,68	\$50.502,25	
TAX (25%)		\$9.682,07	\$9.966,49	\$10.247,73	\$10.524,75	\$11.009,04	\$11.773,82	\$12.056,67	\$12.625,56	
DEPRECIATION		\$4.851,00	\$4.851,00	\$4.851,00	\$4.675,50	\$4.675,50	\$2.515,50	\$2.515,50	\$2.515,50	
AMORTIZATION		\$130,00	\$130,00	\$130,00	\$130,00	\$130,00	\$0.00	\$0.00	\$0.00	
Fixed investments	\$59.260,75									
Deferred investment	\$650,00									
Working capital		\$8.224,03								
REDEMPTION CREDIT		\$3.256,66	\$3.743,01	\$4.302,00	\$4.944,47	\$5.682,89	\$6.531,58	\$7.507,02	\$8.628,13	
TOTAL OF EXPENSES	\$59.910,75	\$125.205,67	\$122.325,58	\$127.980,14	\$133.968,41	\$139.677,87	\$146.113,10	\$151.988,12	\$158.628,61	
NET FLOW	-\$ 59.910,75	\$17.565,53	\$26.156,47	\$26.441,19	\$26.629,77	\$27.344,24	\$28.789,89	\$28.662,99	\$29.248,55	\$7.826,00
DISCOUNT RATE		15.04%								
PRESENT VALUE INCOME		\$719.079,76								
PRESENT VALUE OUTFLOWS		\$662.876,50								
NET PRESENT VALUE		\$56.203,25								
RATE OF INTERNAL RETURN		37,47%								
BENEFIT COST RATIO		1.08								

Source: Financial study.

6.1.1 PRODUCTION CURRENT

With the implementation of this project estimated that, in comparison with the previous production area, we observe that there is a considerable increase of the area used for the operation of facilities which is almost 4 times more, which is of great benefit for textile Vinardi microenterprise.

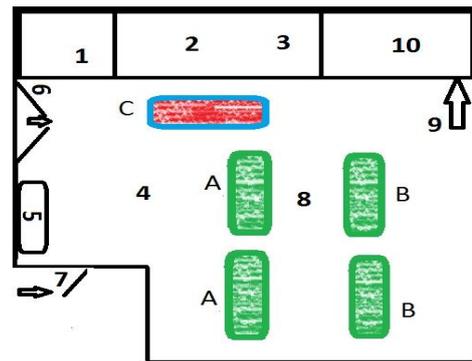
6.1.2 PRODUCTION CURRENT

Data according to the market study reflect that production will increase by 13.91% of the annual total and directly face the unmet demand in our market so we will have better opportunities to compete and major goals to achieve, this is the vision of Textiles Vinardi which prepares to expand and grow in relation to the textile industry of our province and country.

6.1.3 CURRENT MICRO LAYOUT

Based on the technical study is presented diagram of distribution of all the facilities in the new infrastructure, allowing better available to each one of the machines according to their dimensions to achieve an optimal route of weaving processes, also a broad space of mobility for operators as well as a better working environment in regard to ventilation since also increase with the expansion of the infrastructure occupation of air volume, therefore there will be less risk of exposure to floating fibers.

Chart 6: Current Lay-out with the project.



Source: Textile microenterprise Vinardi.

The distribution of plant nomenclature:

1. Main office.
2. Reception and weft storage cellar.
3. Flat top or inspection area.
4. Textured reception area.
5. Electric control board.
6. Main entrance to production plant.
7. Output of emergency or secondary door.
8. Distribution of facilities in microenterprise.
9. Stairs.
10. Quarter of materials and spare parts for maintenance.
- A. Available to existing in the area of production looms.
- B. Provision of new machinery for the production.
- C. Machine bending machine for measuring, reviewing and folded tissue.

The increase in infrastructure and facilities of microenterprise Textiles Vinardi assures us a scenario of challenges both in productivity and profitability. Not to mention that is thanks to everyone's support and those who are part of this micro-enterprise.

7 CONCLUSIONS

THE DIAGNOSIS, SWOT AND PESTLA

- ✚ According to internal diagnostics most important threat that would face the microenterprise is the fulfillment of the life cycle of the normal canvas, given this strategy to consider is the entry of a new product to the local market as it is the case of flannel, since it is manufactured with the same materials.
- ✚ PESTLA diagnosis heading for micro-enterprises to strengthen, to give continuity and adjust to the follow-up strategies for the tastes and needs of customers who make up the local market and at the same time look more profitable markets with the help of relevant studies.

THE MARKET STUDY

- ✚ We conclude the existence of the potential demand of both fabrics in the year 2014 and with reference in the data of the surveys estimated that at least 10.704 meters of fabric a year are not consumed in the local market. **(Table 81)**.
- ✚ The supply of tissues should be greater by microenterprise by which should increase the capacity of production, considering that the project will absorb the 81% (96 rolls) demand for canvas and 89% (80 rolls) demand of Indian fabric in the year 2015. **(Tables 10 and 11). P. 58.**
- ✚ We can say that a total of 16 workshops surveyed 75% (12) of them are willing to trade with microenterprise. **(Chart 21). P. 42.**

THE TECHNICAL STUDY

- ✚ It is concluded that the optimum size of the microenterprise aims facilities or productive capacity and infrastructure expansion or construction of the plant, aspects that are demand-driven that it plans to absorb in the market; raising considerably the efficiency of the plant. **(Table 10). P. 62.**
- ✚ The Lay-out of the micro-enterprise is organized in compliance with the new infrastructure and facilities, the position of the machines and equipment were made so that processes run more fluid and fast as possible and the distribution is the process-oriented since it is planned to produce both knitted simultaneously. **(Graphics, 33, 34, 36). P. 88.**
- ✚ Determined the necessary machinery to increase the productive capacity of microenterprise and acquired two rapier looms of the Dornier House due to its technical characteristics; also determined the amount of materials and supplies needed to start up. **(Budget of investments, table 24) p. 85.**

THE FINANCIAL ECONOMIC STUDY

- ✚ The profitability of the project is evaluated with the net present value (NPV) which is positive and its value is \$ 56.203, was also calculated the internal rate of return (IRR) with funding that has a value of 37,47% and the cost/benefit ratio is greater than one (≥ 1) 1.08 indicating that micro-enterprises can meet all obligations in the short term without any other loans. **(Table 69). P. 145.**
- ✚ The return on investment is expected at 2 years, 11 months and 8 days, for this has been the minimum rate of

return and the net cash flow for the whole period of the project. **(Table 72). P. 150.**

THE PRODUCTION ANALYSIS

- ✚ With the acquisition of new machinery is estimated that productions of fabrics will rise 13.91% of the total annual production, which is very benefit for microenterprise and customers, decreasing from a favorable demand unmet potential. **(Tables 10 and 11, p.62)**
- ✚ With the expansion of infrastructure and facilities of microenterprise Textiles Vinardi has been corrected many shortcomings compared with the former plant this trace us a scenario of challenges both in productivity and profitability. **(Table 83). PAG.167.**

8 RECOMMENDATIONS

- ✚ Market, technical and economic studies is recommended for more information with clear and precise data on which be based before making an investment like that arises in this research.
- ✚ Use the financial tools that allow to know the monetary approach costs and amounts of investments that are going to make and you can verify their feasibility.
- ✚ It is advisable to look for a supplier of raw materials that is as closely as possible micro because it helps optimize human and economic resources.
- ✚ Another of the main recommendations would be purchasing machinery that is commensurate with the needs of our environment, unwanted facilities

extras to operate which would represent more maintenance costs.

ANNEXES

Photo 7: Former weaving workshop.



Source: Microenterprise Vinardi.

Photo 8: Workspace of the (former) loom.



Source: Microenterprise Vinardi.

Photo 9: Previous installations of microenterprise.



Source: Microenterprise Vinardi.

Photo 55: new micro-enterprise infrastructure.



Source: Microenterprise Vinardi.

Photo 68: acquired machinery production.



Source: Microenterprise Vinardi.

Photo 57: improvement and increase of the facilities of weaving.



Source: Microenterprise Vinardi.

Photo 73: looms (4) producing plain weave.



Source: Microenterprise Vinardi.

Photo 62: reception of raw materials.



Source: Microenterprise Vinardi.

Photo 50: location of the Bender in new installations.



Source: Microenterprise Vinardi.

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