FRUIT PRODUCTION AND FRUIT PULP EXTRACTION: AN ALTERNATIVE FOR DEVELOPMENT OF THE SOUTHEAST REGION OF BAHIA, BRAZIL

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Abstract

The fruit pulp agroindustry is considered an alternative for the economic recovery of Brazil's cocoa producing region, typified by the southeastern portion of the Brazilian state of Bahia. Our research examines this agroindustrial segment to determine the financial viability of fruit pulp extraction and processing at different production levels. Our data is of a primary nature and was obtained by interviewing administrators of four different sized fruit-pulp extraction and processing plants. The plants selected had maximum production capacities of 100, 500, 1000, or 5000 tons of fruit pulp per year. Indicators of investment analysis and the cost theory for determining the economics of scale are employed in this study. The results show the existence of economies of scale, identifying the plant that extracted and processed 5000t of fruit pulp per year as the more financially viable. It is concluded that fruit pulp processing can benefit the rural area, stimulating fruit production and providing an important source of income and employment.

Key-words: agroindustry, fruit pulp, Bahia.

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1. Introduction

The cocoa crop in the Brazilian state of Bahia has been steadily losing its economic importance causing serious problems, most notably, in the state's southeastern region. Fruit production is being considered as an important alternative method of generating income and employment to promote the region's economic recovery. Bahia's fruit producers have received production incentives through financing from the public institutions responsible for formulating and implementing development. These efforts have resulted in a substantial increase in fruit production, necessitating a search for alternative methods to economically dispose of the fruit. The pulp processing industry has been focused on as one such alternative.

Pulp processing industries have the ability to reduce current excess fruit inventories while stimulating continued and expanded fruit production. They help reduce losses caused by the excessive transportation of raw fruit and make for better use of lower quality produce (small, deformed, etc). By providing fruit pulp throughout the year, they also facilitate the consumers' access to fruit products.

In this context, Peixoto (1997) argues that agroindustry may be used to stimulate the modernization of irrigated agriculture in Brazil's northeast while creating obstacles to the transference of rural income, providing employment to the rural population, and utilizing surplus raw materials. Expanded production of pulp from fruits in the southeastern region of Bahia would help support economic growth beyond the foreseen income and employment benefits by stimulating growth in the area under productive cultivation and diversifying rural economies.

Many studies have also shown the importance of agricultural industries to the rural sector growth. According to Wagner (1988), rural industrialization brings very important benefits to a country reaching the advanced stage of development, as at this point, the larger portion of agricultural production is used by industry before reaching the final consumer. Santos and Capp Filho (1981) agreed that agricultural industry can play an important role in the rural sector by absorbing raw material produced in the primary sector while transferring capital, technology, and administrative skills back to the rural sector. Also, locating agroindustries in rural areas reduces transportation costs and creates job opportunities for the most needy. Araújo *et al.* (1999) consider that agricultural industry is one alternative that may be used to create jobs, and increase incomes.

In order to expand pulp production activities, financial returns must be brought to the entrepreneur. One factor inhibiting entrepreneurial investment in this activity in Bahia is the lack of information regarding this industry's economic feasibility in the region. For this reason, our study intends to provide information regarding the economics of scale and financial viability of four fruit pulp production plants of different size in the southeast region of Bahia, Brazil.

2. Methodology

2.1. Source of Data

The information used in our study was obtained through the completion of questionnaires by the administrators of four separate pulp production plants. These processing plants were selected to represent typical plant capacities found in this industrial segment. The plants had production capacities of 100, 500, 1000, and 5000 tons of fruit pulp per year. All monetary values used in this research refer to the R$ of December 1999.

2.2. Method of Analyses

Identification of economy of scale

The economy of scale was identified in order to determine the most efficient fruit pulp production plant size. The economy of scale is observed when the long run average cost curve decreases as the production level of the firm increases. On the other hand, diseconomy of scale is noted when an increase in production volume causes the long run average cost curve to start rising after having reached a minimum value.

Investment analysis

From the point of view of economic analysis, capital investment is a productive activity of limited duration, which implies that financial resources in the form of production goods are mobilized with the expectation of generating future resources in a given time period. This concept assumes that the inputs and outputs associated to a project can be transformed into monetary value (Noronha and Duarte, 1995). Our analysis considered the inflow of income and outflow of costs over the period under study with information about these two flows permitting calculation of the investment's return.

Profitability indicators

The following indicators are considered in our analysis: Present Liquid Value (PLV), Benefit-Cost Ratio (B/C) and the Internal Rate of Return (IRR), as suggested by Gittinger (1984), Noronha (1987) and Magalhães (1986).

2.3. Pay Back Period (PBP)

The pay back period corresponds to the time needed for the firm to recover their initial capital investment. Several authors have applied this technique by using a discount rate equal to the opportunity cost of capital. In this study the same method is used to determine the pay back period for each production unit.

Sensibility analysis

Sensibility analysis shows the basic results' sensitivity to changes that may occur in the variables composing the returns and costs flows. In other words, it shows the alteration observed in economic indicators due to changes in parameters that are subject to uncertainties. This type of analysis has the advantage of providing entrepreneurs with information needed to determine some types of risks that may be faced over the life of a project. A discount rate of 10% was used our study.

3. Results and Discussion

3.1. Cost Analysis

As mentioned earlier, four different capacity fruit pulp processing plants were analyzed. The plants had a yearly fruit pulp output of either 100t, 500t, 1000t or 5000t. It assumed that each plant operates 300 days/year.

The annual quantity of raw material processed and the amount of pulp produced (extracted) by each plant are presented in Table 1. The quantity of fruit processed by plants producing 100, 500, 1000, and 5000 tons of fruit pulp annually was 171,764 kgs, 858,822 kgs, 1,717,644 kgs and 8,558,218 kgs respectively. Though the capacity of each type of fruit to produce pulp influences these results, this is not a factor in our production cost analysis as all plants process the same proportion of the various fruits. In this study, it is observed that maracujá yields the least pulp per kilogram of fruit, having a productivity value of 0.32 (0.32 kg of pulp/kg of fruit).

Table 1 – Productivity and quantity of raw material (kg) for the four sizes of fruit pulp processing plants in the southeastern region of Bahia

Specification	Productivity	Plant Size			
		100 t	500 t	1,000 t	5,000 t
Hog-plum	0.53	36,674	183,372	366,744	1,833,720
Cocoa*	1.00	16,021	80,103	160,205	801,025
Pineapple	0.51	25,960	129,800	259,600	1,297,998
Maracujá	0.32	38,793	193,967	387,934	1,939,671
Acerola	0.81	13,111	65,556	131,112	655,561
Guava	0.84	12,379	61,893	123,787	618,933
Mango	0.60	12,595	62,974	125,948	629,738
Umbu	0.61	10,203	51,015	102,031	510,154
Cashew	0.68	4,289	21,445	42,889	214,447
Custard apple	0.69	1,739	8,697	17,395	86,973
Total (kgs)		171,764	858,822	1,717,644	8,588,218

Source: Research data

• In the case of cocoa, raw material in the form of pulp is considered.

The fixed, variable, and average costs for each size processing plant are shown in Table 2. It is noted that variable costs are the main component of total cost, increasing as a percentage of total costs as the processing capacity of the plant increases. Variable costs represented 71.62% of the smallest plant's total costs and 93.40% of the largest plant's total costs.

Table 2 – Annual total cost of pulp production from fruits for the four plants in the southeastern region of Bahia

Specification	Plant Size							
	100 t		500 t		1,000 t		5,000	
	Cost	%	Cost	%	Cost	%	Cost	%
Fixed cost	41,066.80	28.38	98,162.39	17.79	154,330.00	14.54	302,616.46	6.60
Variable cost	103,631.34	71.62	453,641.39	82.21	90,672.65	85.46	4,280,003.21	93.40
Total cost	144,698.14	100.00	551,803.78	100.00	1,061,202.65	100.00	4,582,619.67	100.00

Source: Research data.

Table 3 presents the fixed[3], variable, and average costs for processing each type of fruit. The study "Diagnostic of Industries of Pulp Production from Fruits" conducted by Araújo *et al.* (1999) provided the basis for determination of the participation of each pulp type in total plant production. Due to the input's high price, custard apple pulp showed the highest average cost for all production plant sizes. Great demand by other regions has elevated this fruit's price and limited production in southeastern Bahia. Maracujá pulp showed the second highest average cost of production due to relatively small amount of pulp that is derived from each fruit. Cocoa pulp showed the lowest average cost of production because the seldom used cocoa by-product used in processing arrives at the plant already shelled.

[3] The items included in fixed cost are: expenditures for permanent labor, social charges, depreciation, insurance, interest, maintenance, and other fixed costs (3% of sum of all costs-mentioned). The components of variable cost are: expenditures for temporary labor, social charges, raw material, office material, cleaning material, petroleum, energy, telephone, packing material, taxes and other expenditures (3% of value of these mentioned items).

Table 3 – Fixed, variable, total and annual average cost of pulp production from fruits for four different size plants in southeast region of Bahia.

	Plant Size															
	100 t				500 t				1,000 t				5,000 t			
	C U S T O S															
Specification	Fixed	Variable	Total	Average	Fixed	Variable	Total	Average	Fixed	Variable	Total	Average	Fixed	Variable	Total	Average
Hog-plum	8,131.53	17,655.55	25,787.08	1.33	19,520.46	74,971.24	94,491.70	0.97	30,770.88	149,680.35	180,451.23	0.93	60,980.73	696,933.35	757,914.08	0.78
Cocoa	6,088.54	13,443.27	19,531.81	1.22	14,257.18	59,605.50	73,862.69	0.92	22,127.80	119,766.46	141,894.26	0.89	41,105.76	565,444.56	606,550.33	0.76
Pine-apple	5,631.95	13,378.82	19,010.77	1.42	13,537.54	57,559.96	71,097.49	1.06	21,356.69	114,902.74	136,259.43	1.02	42,458.20	538,596.45	581,054.66	0.87
Maracujá	6,000.11	20,518.03	26,518.13	2.15	14,771.84	90,454.02	105,225.87	1.70	23,640.68	179,908.25	203,548.92	1.65	49,666.90	856,859.12	906,526.02	1.47
Acerola	4,027.49	10,956.09	14,983.58	1.41	9,509.80	49,143.30	58,653.10	1.10	14,837.68	98,520.76	113,358.44	1.07	28,191.64	468,866.85	497,058.49	0.94
Guava	3,808.06	8,896.85	12,704.91	1.22	8,991.10	39,074.48	48,065.58	0.92	14,027.81	78,402.68	92,430.49	0.89	26,648.41	369,071.39	395,719.80	0.76
Mango	3,023.23	8,081.99	11,105.22	1.48	7,224.88	35,634.14	42,859.02	1.14	11,357.36	71,255.03	82,612.40	1.10	22,257.87	337,350.04	359,607.92	0.96
Umbu	2,445.72	5,583.09	8,028.80	1.29	5,845.20	24,016.18	29,861.39	0.96	9,188.98	48,032.94	57,221.92	0.92	18,011.76	224,649.44	242,661.20	0.78
Cashew	1,153.96	2,814.35	3,968.30	1.37	2,741.45	12,365.47	15,106.92	1.04	4,293.73	24,756.21	29,049.95	1.00	8,289.38	116,851.65	125,141.03	0.86
Custard apple	756.22	2,303.32	3,059.54	2.54	1,762.93	10,817.09	12,580.03	2.09	2,728.38	21,647.23	24,375.62	2.02	5,005.81	105,380.35	110,386.16	1.83

Source: Research data

Determination of economy of scale

Table 3 shows that average production costs decrease as the plant's production capacity increases. This finding does not verify the existence of diseconomies of scale for any of the four production sizes analyzed. It does reflect the increasing productivity of labor as fruit processing plant size increases. Another factor responsible for the positive correlation between productivity and processing plant size is the ability of plants with higher capitalization to acquire and more capably use technology.

3.2. Investment analysis

Table 4 gives information on prices, pulp quantities produced, revenues from of each type of fruit pulp sold, and total revenue of each plant under study. Profitability indicators were obtained by considering the cash flows shown in Tables 1A to 4A (Appendix).

Table 4 – Gross annual income, product price and quantities produced for four pulp processing plants in the southeast region of Bahia

Produt	Price (R$/kg)	Plant Size							
		100 t		500 t		1,000 t		5,000 t	
		Quantity (kg)	Total Value (R$)	Quantity (kg)	Total Value (R$)	Quantity (kg)	Total Value (R$)	Quantity (kg)	Total Value (R$)
Hog-plum	1.35	19,383	26,125.47	96,917	130,627.36	193,834	261,254.72	969,171	1,306.,73.58
Cocoa	1.33	16,020	21,244.55	80,102	106,222.73	160,205	212,445.46	801,024	1,062.,27.31
Pine-apple	1.35	13,364	18,012.44	66,820	90,062.20	133,641	180,124.40	668,203	900,622.00
Maracujá	1.42	12,358	17,551.56	61,789	87,757.81	123,577	175,515.62	617,887	877,578.12
Acerola	1.29	10,626	13,683.16	53,131	68,415.80	106,262	136,831.60	531,310	684,158.01
Guava	1.24	10,400	12,940.33	52,002	64,701.65	104,005	129,403.30	520,025	647,016.48
Mango	1.31	7,522	9,866.26	37,612	49,331..31	75,223	98,662.63	376,117	493,313.15
Umbu	1.28	6,221	7,979.48	31,106	39,897.42	62,213	79,794.83	311,065	398,974.16
Cashew	1.33	2,897	3,842.19	14,487	19,210.93	28,974	38,421.87	144,869	192,109.33
Custard apple	2.22	1,207	2,675.47	6,033	13,377.35	12,066	26,754.70	60,329	133,773.49
Total		100,000.00	133,920.91	500,000,00	669,604.56	1,000,000,00	133,909.13	5,000,000	6,696,045.63

Source: Research data.

Analysis of Table 5 showed that the plant with a yearly processing capacity of 100t is not economically efficient. For the 100t plant, the net present value and the internal rate of return have negative values and the benefit-cost ratio is less than 1, varying from 0.86 to 0.91 contingent upon changes in the discount rate.

Table 5 – Benefit-Cost Ratio (B/C) and Net Present Value (NPV) at different discount rates and the Internal rate of return (IRR) for the four pulp processing plants in southeastern Bahia

Discount Rate (%)	Plant Size							
	100 t		500 t		1,000 t		5,000 t	
	B/C	NPV	B/C	NPV	B/C	NPV	B/C	NPV
6	0.91	-106,622.93	1.20	846,235.05	1.25	2.017.168,02	1,45	15,454,118.31
8	0.90	-108,093.73	1.19	740,404.19	1.24	1.785.366,21	1,44	13,902,269.65
10	0.89	-109,165.35	1.18	649,336.22	1.23	1.585.447,83	1,43	12,559,196.80
12	0.88	-109,925.65	1.17	570,580.03	1.23	1.412.172,80	1,43	11,391,147.26
15	0.86	-110,627.68	1.16	471,271.83	1.21	1.193.094,12	1,41	9,908,290.36
Internal Rate of Return (%)	< 0		54.48		73.82		181.86	

Source: Tables 1A to 4A.

The plants producing 500, 1000, and 5000 t/year presented benefit/cost ratios greater than unity and a positive net liquid value at all discount rates considered. The value of the rate of return was superior to the opportunity cost of capital.

It is noted that an increase in the level of production makes rentability indicators more attractive. Given a discount rate of 10%, the plants producing 500, 1000, and 5000 t/year presented respective B/C ratios of 1.18, 1.23, and 1.43 respectively, which indicates that R$ 1.00 spent by a 5000 t/year plant brings an average return of R$ 1.43.

3.3. Pay back period

Due to the smallest plant's (100t/year) lack of profitability, the time to pay back the initial investment is not addressed: the investment cannot be recouped. The time needed for the other plants to generate enough profit to cover the initial capital investment at a discount rate of 12% is shown in Table 6. It is verified that capital invested in the three larger fruit pulp production plants is recovered in relatively short period of time. For plant sizes of 500, 1000, and 5000 t/year, the initial capital expended is recovered after 3 years, 2 years, and 1 year of operation respectively.

Table 6 – Necessary time required to recoup capital invested in fruit pulp processing plants in the southeastern region of Bahia

Plant Size (t)	Number of Years
100	-
500	3
1000	2
5000	1

Source: Research data.

3.4. Sensibility Analysis

Several simulations were performed to examine the effect of possible changes in the price of fruit pulp and the cost of raw materials using a discount rate of 10% (Table 7). The plants producing 1000 and 5000 tons of pulp/year remained economically feasible in all situations. The plant with a production capacity of 500 t/year was profitable under all simulations except in the case of a 20% reduction in the price of pulp and 5% increase in the price of raw materials. This shows the results stability in several unexpected situations (Table 7).

Table 7 – Sensibility analysis of economic indicators for fruit pulp processing plants in the southeastern region of Bahia at discount rate of 10%.

Specification	Plant Size								
	500 t			1,000 t			5,000 t		
	B/C	NPV	TIR	B/C	NPV	TIR	B/C	NPV	TIR
Normal revenue and costs	1.18	649,336.22	54.48	1.23	1,585,447.83	73.82	1.43	12,559,196.80	181.86
10% decrease in product price and no change in cost	1.09	312,248.11	31.65	1.14	911,271.63	46.80	1.33	9,188,315.78	133.07
15% decrease in product price and no change in cost	1.04	143,704.06	20.11	1.09	574,183.53	33.37	1.27	7,502,875.27	109.26
20% decrease in product price and no change in cost	0.99	-24,839.99	8.21	1.04	237,095.43	19.81	1.21	5,817,434.77	85.97
10% increase in raw material price, product price constant	1.14	513,486.74	44.94	1.19	1,314,262.70	62.43	1.37	11,200,702.03	160.24
15% increase in raw material price, product price constant	1.12	445,562.00	40.23	1.16	1,178,670.14	56.82	1.34	10,521,454.65	149.61
20% increase in raw material price, product price constant	1.10	377,637.26	35.56	1.14	1,043,077.57	51.26	1.31	9,842,207.27	139.11
10% decrease in product price and 5% increase in raw material price	1.07	244,323.38	26.93	1.12	775,679.06	41.24	1.29	8,509,068.40	122.66
15% decrease in product price and 5% increase in raw material price	1.02	75,779.32	15.34	1.07	438,590.96	27.85	1.24	6,823,627.89	99.14
20% decrease in product price and 5% increase in raw material price	0.97	-92,764.73	3.26	1.02	101,502.86	14.22	1.18	5,138,187.39	76.21

Source: Research data.

3.5. Employment creation by fruit pulp industries in the southeastern region of Bahia

The fruit pulp production agroindustry generates mainly rural jobs in the several segments of its productive chain. Data given in Table 8 indicates that a processing plant that produces 5000 tons of pulp/ year directly employs 104 workers and, through the multiplier effect, indirectly creates an additional 2,600 jobs.

Table 8 - Employment generated by four fruit pulp production plants in southeastern Bahia.

Plant Size	Quantity		
	Direct	Indirect	Total
100	7	175	182
500	19	475	494
1,000	33	825	858
5,000	104	2,600	2,704

Source: Research data.

4. Conclusions and Suggestions

Variable costs are the main component of a pulp production plant's total cost. The variable cost's proportion of total costs increases as processing capacity increases and decreases as capacity decreases. The principal variable costs are raw materials, taxes, packing material, and labor.

The existence of economy of scale is verified. An increase in processing plant capacity is accompanied by a decrease in the average cost of pulp production.

With the exception of the 100t/year processing plant, all other plants are economically viable. These results become more significant as the size of the plant increases.

Sensibility analysis shows that the obtained results are stable, meaning that all plants except the one producing 100 t/year remain economically feasible under changing revenue and cost flows.

Pulp production agro-industries brought social benefits in the form of employment generation in the industrial segment and, due to the multiplier effect, provoked the creation of indirect employment mainly in rural areas as fruit production grew.

Due to the potential for increased income and employment through the expansion of fruit pulp agro-industries, it is recommended that additional detailed studies of the fruit pulp productive chain be made to evaluate this industrial option as a stimulus to regional economic recovery.

In order to spur regional development, a collective effort between institutions supporting technical assistance, rural extension services, and governmental and non-governmental credit agencies should be made to improve fruit varieties and increase credit for fruit cultivation and agro-industrial expansion. This would facilitate improved integration between agriculture and industry, generating employment and increasing income.

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Appendix

Table 1A – Cash flow for a plant processing 100t of fruit pulp per year in the southeastern region of Bahia.

Especification	Years of Project										
	0	1	2	3	4	5	6	7	8	9	10
A – INFLOW											
- Revenue		133,920.91	133,920.91	133,920.91	133,920.91	133,92091	133,920.91	133,920.91	133,920.91	133,920.91	133,920.91
- Disinvestment											54,976.37
Revenue (A)		133,920.91	133,920.91	133,920.91	133,920.91	133,920.91	133,920.91	133,920.91	133,920.91	133,920.91	188,897.29
B – OUT FLOW											
Investment	89,823.89										
Reinvestment											
Financial immobilization		21,630.38									
Operational cost		135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73
Cost (B)	89,823.89	157,591.11	135,.960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	135,960.73	157,591.11
Net Cash Flow (A-B)	-89,823.89	-23,670.2	-2,039.8	-2,039.82	-2,039.82	-2,039.82	-2,039.82	-2,039.82	-2,039.82	-2,039.82	3,306.18

Source: Research data.

Table 2A – Cash flow for a plant processing 500t of fruit pulp per year in the southeastern region of Bahia.

Especification	Years of Project										
	0	1	2	3	4	5	6	7	8	9	10
A – IN FLOW											
- Revenue		669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56
- Disinvestment											157,759.34
Revenue (A)		669,604.56	669,604.56	669.604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	669,604.56	827,363.90
B – OUT FLOW											
Investment	202.655,64										
Reinvestment					25,000.00						
Financial immobilization		90,759.33									
Operational cost		524,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30
Cost (B)	202.655.64	615,650.64	524,891.30	524,891.30	524,891.30	549,891.30	524,891.30	524,891.30	524,891.30	524,891.30	524,891.30
Net Cash Flow (A-B)	-202,655.64	53,953.92	144,713.26	144,713.26	144,713.26	119,713.26	144,.713.26	144,713.26	144,713.26	144,713.26	302,472.59

Source: Research data.

Table 3A – Cash flow for a plant processing 1,000t of fruit pulp per year in the southeastern region of Bahia.

Especification	Years of Project										
	0	1	2	3	4	5	6	7	8	9	10
A – IN FLOW											
- Revenue		1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,209.13
- Disinvestment											271,572.52
Revenue (A)		1,339,209.13	1,339,209.13	1,339.209.13	1,339,209.13	1,339,209.13	1,339,209.13	1,339,09.13	1,339,209.13	1,339,209.13	1,610,781.64
B – OUT FLOW											
Investment	340,.340.59										
Reinvestment						42.000.00					
Financial immobilization		169,572.52									
Operational cost		1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35
Cost (B)	340,340.59	1,183,075.87	1,013,503.35	1,013,503.35	1,013,503.35	1,055,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35	1,013,503.35
Net Cash Flow (A-B)	-340,340.59	156,133.26	325,705.77	325,705.77	325,705.77	283,705.77	325,705.77	325,705.77	325,05.77	325,705.77	597,278.29

Source: Research data.

Table 4A – Cash flow for a plant processing 5,000t of fruit pulp per year in the southeastern region of Bahia.

Specification	Years of Project										
	0	1	2	3	4	5	6	7	8	9	10
A – INFLOW											
Revenue		6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63
Disinvestment											1,068,452.31
Revenue (A)		6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	6,696,045.63	7,764,497.93
B – OUTFLOW											
Investment	955,410.62										
Reinvestment						117,000.00					
Financial immobilization		815,452.31									
Operational cost		4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41
Cost (B)	955,410.62	5,246,628.72	4,431,176.41	4,431,176.41	4,431,176.41	4,548,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41	4,431,176.41
Net Cash Flow (A-B)	-955,410.62	1,449,416.91	2,264,869.21	2,264,869.21	2,264,869.21	2,147,869.21	2,264,869.21	2,264,869.21	2,264,869.21	2,264,869.21	3,333,321.52

Source: Research data