
Brazil

Planting Resilience in Rural Communities of the Northeast (PCRP)

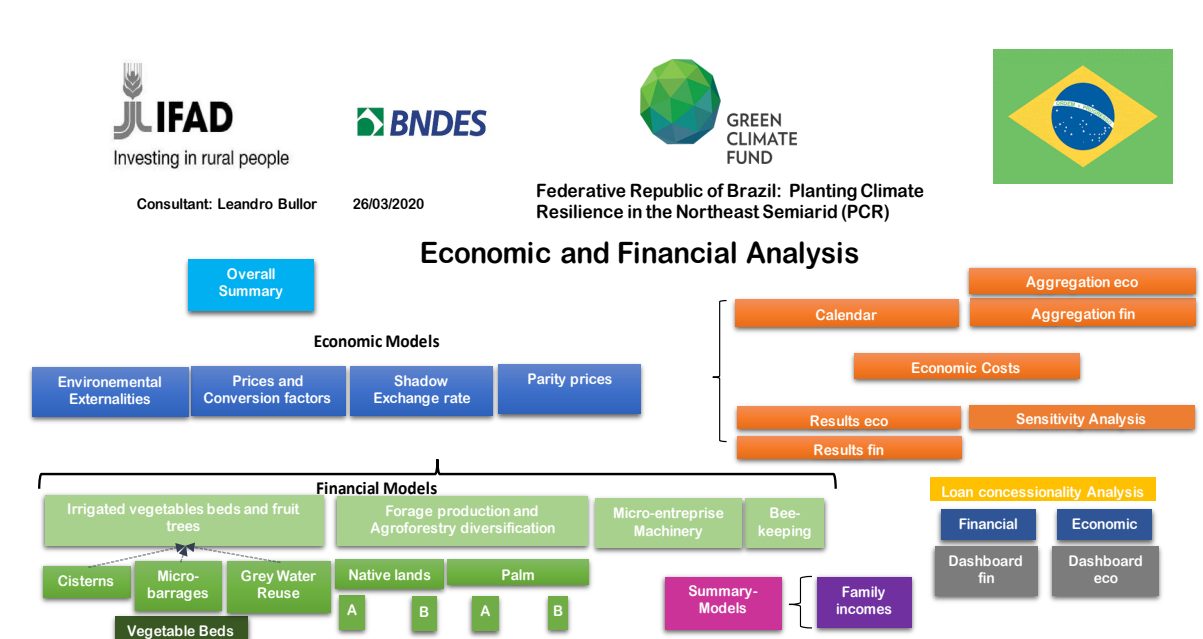
Annex 3A – Summary of Economic and financial analysis Assumptions

July 2020

A. Introduction

1. The current appendix summarizes the main assumptions, hypothesis and results of the Programme's economic and financial analysis. The profitability indicators are calculated taking into account the outcomes, phasing and expected beneficiaries for each type of activity. Benefits lifetime cycle are calculated for a 20-year period as the project involves agroforestry and natural resource management activities with both short and long-term results, requiring an extended period for the analysis.
2. The economic and financial analysis consists of comparing the resources required for the project's implementation (represented by the project costs) with the expected impacts calculated as the benefits of each promoted activity. It is conducted from the point of view of each beneficiary (financial analysis), but then also aggregating and calculating the benefits for the Brazilian economy. It should be noted that the present appendix represents only one point of view of the global evaluation of the proposed new Project (that should also consider social, environmental and institutional aspects).
3. Financial analysis allows to understand, based on behavioral hypothesis and parameters, if potential beneficiaries will be motivated to take the risks and make the investments required by the project. It implies to simulate the incentives and benefits at the individual level (or even in groups), but also to make sure that the beneficiaries will have the means to take on the project's proposal, with a realistic approach by making assumptions on the delays in adopting technologies and on drop-out rates for entrepreneurship initiatives.
4. Economic analysis considers all the costs and benefits of the Project. It allows to evaluate the global efficiency in management resources for the government and society as a whole. The analysis is made by aggregating the farm models using economic prices and adding externalities (that will be represented in this case by the environmental benefits from avoiding CO₂ emissions).
5. Both in the financial and economic analysis, each initiative will be considered profitable if the additional benefits of the project's cash-flows (over a 20-year period) surpass investment and recurrent costs at a cut-off rate (10%). As a result, profitability indicators will be the Net Present Value (NPV, economic and financial), the Internal Rate of Return (IRR, economic and financial) and the Benefit-Costs ratio (B/C, both economic and financial). The sensitivity analysis will test the vulnerability and robustness of the obtained results for changes in the key economic variables.
6. The first part of the document summarizes the sources of project's benefits (both measurable and not measurable) as well as the main assumptions and hypothesis made. Thereafter, the financial analysis is presented, which analyzes the proposed models and the corresponding expected benefits. In the end, aggregated benefits (with externalities included) will determine the overall economic profitability and the sensibility of the results in face of negative shocks and climatic events.
7. Estimates and calculations were made through field visits, consultations with experts and other revisions including current agroforestry experiences records and M&E tables. Nevertheless, as far as the proposed activities are not still disseminated among beneficiaries, the models still represent a theoretical construction that needs to be demonstrated in field experiences to get those agroforestry leaders that will set a trend.

Illustration 1. EFA Map



B. Summary of benefits, main assumptions and hypothesis

Concerning Component 1, both quantitative and qualitative benefits are expected from the Project's intervention relying on two axes: (a) Increased access to water for production by implementing tested social technologies; (b) the transition in agricultural practices to a new productive and resilient model with impact on food security and climate change mitigation. For Component 2, benefits are based on promoting Agroforestry practices and technologies in order to increase resilience and productivity for each forage production ecosystem, improving income generation and reducing the environmental pressure. All measurable benefits arise from addressing several problems such as: (i) decrease in incomes as a result of increased costs of forage purchases when a climate change event occurs; (ii) decreased productivity due to the high pressure on native grazing; (iii) expansion of degraded lands and unsustainable practices in collective areas.

Direct outcomes are expected to come from an increase in the land area that will be recovered under the new approach, as well as increased productivity, sales and incomes for the family farms involved. The following quantitative economic co-benefits can be pointed out:

- At least 15% increase in highly vulnerable house-hold's income as a result of participating in resilient productive Investments contributing to the poverty alleviation in the region.
- At least 30.000 ha of degraded or monoculture lands turned out into diversified and integrated agroforestry models.
- 36.000 highly vulnerable farmers covering at least 12.000 ha benefiting from resilient productive investments increasing the water supply from Component 2 interventions.
- Estimated Increase in local fruit production of 78.000 tons after a 10-year period, improving the local population availability of fresh fruits and vegetables and improving local consumption.
- 70 local micro-enterprises created that generates at least 200 local jobs for rural youths related to resilient productive family farming technologies.
- At least 540 beneficiaries of ISAs in collective areas diversify their sources of income with other income generation activities.

- 20,000 family farms participating in ISAs reaching an increase in biomass production of at least 50.000 kg/ha after a 10-year period.
- At least 1.080 small-holder house-holds saving amounts between R\$ 80 and 104 per month in firewood purchases due to the implementation of efficient and ecological systems (stoves and bio-digestors)
- At least 36.000 ha of collective areas benefits from natural resource management investment plans reducing Co2 emissions and improving family's livelihoods.

Qualitative benefits rely on (i) social-capital enhancement and improved cohesion to increase empowerment in targeted groups, (ii) improvements in food security, nutrition and health by increasing self-consumption of more in-farm natural fruits and vegetables.

8. Impact in incomes is simulated by comparing each model family revenue with several representative scenarios of a typical 2-person income house-hold. The average increase in incomes can be estimated at around 20%.

Table 1. Income impact Indicators per Model per year

ITEM	Unit	Models								
		Model 1a- Veg. Beds and Fruit trees 1- Grey Water Reuse	Model 1b- Veg. Beds and Fruit trees 2- Other Water Infrastructure	Model 1c- Veg. Beds and Fruit trees 3- Cistems	Model 2a- Forage production and Agroforestry diversification in native lands 1	Model 2b- Forage production and Agroforestry diversification in native lands 2	Model 3a- Forage production and Agroforestry diversification in palm monoculture lands 1	Model 3b- Forage production and Agroforestry diversification in palm monoculture lands 2	Model 4- Micro-entrepreneur Business development	Model 5- Bee-keeping
Without Project		*	**	***	***			**	***	
Incomes without project / Equivalent labour	\$R/yr	724	2,171	2,171	1,376	1847	4,176	63,563	34,452	1,080
With Project										
Family income	\$R/yr	6,358	7,606	9,194	7,154	8,706	9,919	74,093	78,038	4,927
% increase	%	779	250	323	420	371	138	17	127	356
% impact / poverty line	%	25%	24%	31%	26%	31%	26%	47%	194%	17%
International Poverty line- World Bank (5,5 USD per day / family)	\$R/yr					\$22,484				
% impact / Average income per house-hold	%	18%	17%	22%	18.32%	22%	17%	22%	138%	12.20%
Average income per household Brazil	\$R/yr					\$31,542				
% Impact / International Poverty line	%	28%	27%	34%	28.27%	34%	27%	34%	213%	18.82%
International Poverty line (\$USD per day / family)	\$R/yr					\$20,440				
60% Minimum Salary	\$R/yr					\$13,493				
Impacts in HH Income (%)	%	42%	40%	52%	43%	51%	43%	78%	323%	29%
75% Minimum Salary	\$R/yr					\$16,866				
Impacts in HH Income (%)	%	33%	32%	42%	34%	41%	34%	62%	258%	23%
50% Minimum Salary	\$R/yr					\$11,244				
Impacts in HH Income (%)	%	50%	48%	62%	51%	61%	51%	94%	388%	34%
Minimum Salary (2 person HH)	\$R/yr					\$22,488				
Impacts in HH Income (%)	%	25%	24%	31%	26%	30%	26%	47%	194%	17%

9. In addition to this, additional economic benefits were considered using the EX-Acte tool.

10. Even if the models assume certain types of activities and try to recognize some possible effects and impacts, the Project act over an uncertain and diverse reality of family farmers, so none of these main activities in the models should be considered mandatory in order to apply for proposals during implementation. On the contrary, the identified supports packages could guide a possible list or menu of Agroforestry packages for each type of environment, context and family that is benefited (given the current categorization that was used in this exercise).

11. Models, sectors and products for the “*with* and *without* project” situation have been selected by applying the following criteria for the Northeast Semi-arid: representativeness (for the “*without* project” situation) and climate change adaptation impacts, scaling-up potential and pro-poor, pro-gender and pro-youth propensity for the proposal (for the “*with* project” situation).

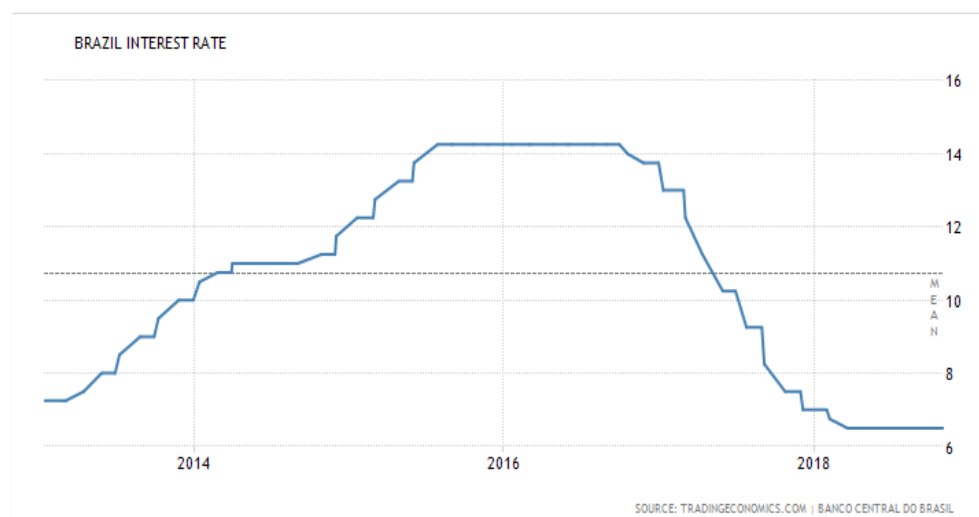
C. Financial analysis

12. The financial analysis considers the costs and benefits for adopting the project's proposal from the individual perspective over the period of 20 years (including the program duration of 8 years).

13. **Prices.** Prices in Brazil are freely determined by the market. References have been taken from local producers, suppliers and retailers, verified with the official and private open information platforms for selected products.

14. **Parameters.** The average local Interest rate for domestic credit in the past 5 years is shown in the table below. The financial discount rate is considered at 10%.

Graphic 1. Average local interest rate (%) 2013-18.



15. **Models.** Nine models were developed to simulate impacts for each type of intervention on each targeted group of beneficiaries. For Component 1, other six models are proposed. Benefits and savings from Bio digesters and Efficient Stoves are considered separately. For Component 2, there are three models to illustrate the range of activities that could be developed by the targeted beneficiaries.

16. **Aggregation.** All of the models are supposed to be progressively involved into the project's proposal from year 1 to 8. That's why the 100% of benefits will be considered after year 8. However, 80% success rate is applied while aggregating in order to better illustrate the case when beneficiaries get lower impacts or dismiss the project's proposal during the first 4 years.

17. **Resilience.** In forage production models there is a simulation of a climate change event that shocks the productivity every 5 years (60% of losses), lows down the breakeven (5%) and has increased impacts without climate change adaptation measures. In the "*With Project*" simulation, adaptation measures would allow to cushion the blow (15%), recover the breakeven and turn over the increase in impacts. All the assumptions are very realistic in order to avoid overestimation of project's benefits.

Table 3. Typical Models proposed

Model	Component/ Output	Objective	Investments	Proposal	Main activity	Level of Capitalization	Typical farmer	Targeted families	Targeted Hectares
1a and 1b	Component 2 Output 2 Activities 2.1.1 / 2.1.2	Irrigated Small plots- Fruit trees and vegetable beds	Cisterns/Micro-dams and Agroforestry Investment Plan and Technical Assistance	Fruit trees and vegetable beds	Fruit and vegetable production	Low	0,5 ha surface and 0.375 ha irrigated area / 21 vegetable beds 10m2 + Diversified fruit trees / 3750m2	21.000	6.300
1c		Irrigated Small plots- Fruit trees and vegetable beds	Grey and dark water treatment and reuse, and Agroforestry Investment Plan and Technical Assistance	Fruit trees and vegetable beds	Fruit and vegetable production		0.125 ha irrigated area / 7 vegetable beds 10m2 + Diversified fruit trees / 1250m2	15.000	1.200
2a	Component 1 Output 1 Activities 1.1.2.1 / 1.1.2.2	Agroforestry diversification in native lands	Agroforestry Investment Plan and Technical Assistance (1)	Forage and fruits production	Sheep and goats breeding- Meat		0,5 ha for Forage production and agroforestry for 50 females / Herd size: 80 animals	10.333	5.167
2b					Poultry farming		0,5 ha for Forage production and agroforestry for 200 laying hens	10.333	5.167
3a		Agroforestry diversification in Palm monoculture lands	Agroforestry Investment Plan and Technical Assistance (2)	Forage and fruits production	Sheep and goats breeding- Meat		0,5 ha for Forage production and agroforestry for 50 females / Herd size: 80 animals	10.333	5.167
3b	Component 1 Output 1 Activity 1.1.4.1	Farmers network	Dairy cattle breeding		Low and Medium	0,5 ha for agroforestry diversification for 20 dairy cattle breeding	5.000	25.000	
4	Component 1 Output 1 Activity 1.1.4.2	Micro-entrepreneur Business development	Micro-entrepreneurs Grants	Investment Plan	Small Machinery	Low and Medium (youth)	Youths entrepreneurs	70	-
5	Component 1 Activity 1.1.3.1	Reduce pressure in Protected and Collective Areas	Funding for the Natural Resource Management Investment Plan	Bee-keeping	Forestry	Low and Medium	Typical family in Collective or Protected Areas	540	36.000
6a				Efficient Stoves				540	
6b				Bio-digesters				540	
								Total	84.124

18. **Component 1.** Six models intend to simulate the impact of Agroforestry Investment Plans (4), Natural Resource Management Investment Plans (with Income Generating Activities) and Micro-enterprises to develop agroforestry suppliers (adapted machinery, nurseries, for example). In the first case, it considers promoting agroforestry activities in degraded or monoculture lands to reduce both the degradation of grasslands and forage purchases when a climate event occurs. For the Natural Resource Management Investment Plans, Bee-keeping is considered as the proposed income generating activity to reduce exploitation of natural resources.

19. Adoption of Agroforestry practices and technologies is an opportunity for farmers to address climate change challenges. All the models proposed try to increase resilience. The table below illustrates each model's in-farm dynamic when adopting Agroforestry technologies and practices.

20. **Component 2.** This group of activities is based on the need of access to water in communities as an entry point to promote the paradigm shift under the agroforestry approach. After providing training and capacity building for the implementation of water infrastructures, the component is supposed to support an agroforestry investment plan with a first round of funding. This is meant to be an element to enhance motivation that will be complemented with hand-holding in the initial phases by a 2-year close technical assistance under a learning by doing approach. All participants should be able to benefit from a minimum agroforestry package. Three models of this type of support are simulated: i) a classic model for the development of a fruit and vegetables 1250sq meters-plot irrigated with grey water reuse infrastructure; ii) a typical farmer of 0,5 ha with a fruit and vegetables 3750sq meters-plot irrigated with different types of micro-dams; and iii) a typical farmer of 0,5 ha with a fruit and vegetables 3750sq meters-plot irrigated with Cisterns.

21. It should be considered that some of the models require only a part-time occupation (from 2 to 6 months depending on the activity). It means that the annual income per year represents only a small part of total family incomes (and sometimes even personal incomes). Also, drop-out rates are very difficult to estimate but an intensive hand-holding, a rigorous selection and the family approach demonstrate that there is a possibility to keep up all the well-sustained investment plan initiatives.

22. **Resilience.** The trends mentioned above affect small producers and agricultural activities in a different way depending on various circumstances. For the purpose of this exercise the last CC trends have been simulated both at the in-farm level and for the sensitivity analysis by making hypothesis and measuring the productive decrease during the shock, taking into consideration their capacity to recover and learn, and even to get a similar level of productivity after the problem is solved, always taking into account eventual future climate events that could happen.

Table 4. Main assumptions on Component 2 models

Aspects/Models	Fruit trees and Vegetable beds irrigated with Grey Water Reuse equipment (1.a)	Fruit trees and Vegetable beds irrigated with Cisterns and Micro-dams (1.b and 1.c)
Area / Irrigated	0.25 ha / 1250 sq meters irrigated	0.5 ha / 3750 sq meters irrigated
Current and Foreseen Crops	Vegetables: Lettuce, Onions, Cabbage, Coriander, Beet among others (foreseen). Fruits: Umbú, Citrus, Manga (foreseen).	
Impact proposition	Access to water for production and agroforestry conversion.	
Quantities	Lettuce: 1 bed 10sqm / 3 cycles/yr, Onions: 2 beds 10sqm / 2 cycles/yr, Cabbage: 1 bed 1sqm / 1 cycle/yr Coriander: 2 beds 10sqm / 2 cycles/yr Beet: 1 bed 10 sqm / 3 cycles/yr Citrus: 10 trees from 3 to 50 fruits per year each Manga: 10 trees from 3 to 50 fruits per year each Umbú: 10 trees from 5 to 20 fruits per year each	Lettuce: 3 beds 10sqm / 3 cycles/yr, Onions: 6 beds 10sqm / 2 cycles/yr, Cabbage: 3 beds 1sqm / 1 cycle/yr Coriander: 6 beds 10sqm / 2 cycles/yr Beet: 3 beds 10 sqm / 3 cycles/yr Citrus: 30 trees from 3 to 50 fruits per year each Manga: 30 trees from 3 to 50 fruits per year each Umbú: 30 trees from 5 to 20 fruits per year each
Labour per Yr	24 days / family labour	72 days / family labour
Self-Consumption	50-80%	30-60%
Financing	Project support and own savings	
Post-harvest Losses	10%	
Main Investments	Seeds and plants, access to water infrastructure, 2-year technical assistance, tools and equipment.	
WOP situation	Even if the real alternative is unemployment, additional benefits are compared to a WOP situation where the farmer is having some incomes sporadically for the equivalent time in labor days required for the proposal.	
Incomes generated	Approximately from R\$1500 to R\$ 3500 depending on the self-consumption rate.	

Table 5. Main assumptions on Component 1 models.

Aspects / Models	Forage Production on Native lands 1	Forage Production on Native lands 2	Forage Production on Palm Monoculture 1	Forage Production on Palm Monoculture 2
Main activity	Goats and sheeps breeding	Poultry	Goats and sheeps breeding	Dairy production / Cows breeding
Area	5-10 ha total area /0.5 ha Agroforestry Proposal	1-5 ha total area /0.5 ha Agroforestry Proposal	10-25 ha total area /0.5 ha Agroforestry Proposal	25-50 ha total area /0.5-1 ha Agroforestry Proposal
Current and Foreseen Crops / Production	Goats and Sheeps (current) Licuri, Umbú, Passion Fruit, Cajú, Sisal, Palma Capim, Sorgho, Milheto, Painço, Feijao, Andu (foreseen)	Chicken and eggs (current) Licuri, Umbú, Cajú, Sisal, Palma Capim, Sorgho, Milheto, Painço, Feijao, Andu (foreseen)	Goats and Sheeps / Palma (current) Licuri, Umbú, Cajú, Sisal, Palma Capim, Sorgho, Milheto, Painço, Feijao, Andu (foreseen)	Milk / Palma (current) Licuri, Umbú, Cajú, Sisal, Palma Capim, Sorgho, Milheto, Painço, Feijao, Andu (foreseen)
Strategy	Biomass production / Stratification / Densification / Diversification		Biomass production / Stratification / Densification / Diversification	
Quantities	Same 45 animals sold per year. 20/30 fruit trees with 20-30 fruits per year each Additional Forage production: 56 tn	Same 6500 eggs and 93 chicken sold per year. 20/30 fruit trees with 20-30 fruits per year each Additional Forage production and sales: 14 tn	Same 45 animals sold per year. 20/30 fruit trees with 20-30 fruits per year each Additional Forage production: 18 tn	Same 129.000 lts sold per year. 20/30 fruit trees with 20-30 fruits per year each Additional Forage production: 24 tn
Labour per Yr	95 days / Family labour	140 days / Family labour	125 days / Family labour	95 days / Family labour 3 rural workers (2 permanent)
Self-Consumption	5-25%	25-40%	5-25%	5-10%
Financing	- Own savings and gains	Own savings and gains	Own savings / Agroamigo / BdB	Credit / BdN / BdB
Forage Demand / year	57 tons	17 tons (supply)	57 tons	82 tons
Main Investments	Fencing, seeds, plants, tools and equipment, land preparation, technical assistance (3 years)	Fencing, seeds, plants, tools and equipment, land preparation, technical assistance (3 years)	Seeds, plants, tools and equipment, land preparation, technical assistance (3 years)	Technical Assistance (2 years)
WOP situation	Overgrazing, low commercial perspective.	No diversification	Overgrazing, low commercial perspective.	Overgrazing, low commercial perspective.
Incomes generated per year	From R\$ 3.600 to R\$ 3.800	From R\$ 4.000 to R\$ 4.600	From R\$ 757 to R\$ 3.200	From R\$ 40.000 to R\$ 45.000

Table 6. Main assumptions on Component 1 models II.

Aspects / Models	Micro-enterprise Machinery	Bee-keeping
Main activity	Commerce / Entrepreneurs	Honey production
Participants	Youths- 3 people group	18 people
Current and Foreseen Crops / Production	Adapted Pieces	Honey, bee wax.
Proposal	Buy and adapt equipment for Agroforestry for family farming	Income generation activity
Quantities	24 pieces per year	360 kg per farmer
Labour per Yr	3 full-time wages / 12 months	36 days / Family labour
Financing	Credit	Project Funding
Main Investments	Start-up grant to initiate the activity	Hives, inputs, tools and equipment
WOP situation	Even if the real alternative is unemployment, additional benefits are compared to a WOP situation where the farmer is having some incomes sporadically for the equivalent time in labor days required for the proposal	Natural Resources exploitation and overgrazing
Incomes generated per year	From R\$ 15.000 to 21.000	From R\$ 3.000 to R\$ 4.000

23. Overall, the financial analysis shows positive Net Present Values (NPV), Financial Internal Rate of Returns going beyond the cutoff rate and Benefit-Costs ratio higher than 1, so all models are considered profitable, with FIRR rates ranging from 10% to 39% depending on the supported activity, and net present values (NPV) at the 10% discount rate varying from R\$ 2.322 to R\$ 219.941. The following list summarizes profitability indicators for all the financial models.

Table 6. Profitability indicators per model (A)

Item	Unit	Models								
		Model 1a- Veg. Beds and Fruit trees 1- Grey Water Reuse	Model 1b- Veg. Beds and Fruit trees 2- Other Water infrastructure	Model 1c- Veg. Beds and Fruit trees 3- Cisterns	Model 2a- Forage production and Agroforestry diversification in native lands 1	Model 2b- Forage production and Agroforestry diversification in native lands 2	Model 3a- Forage production and Agroforestry diversification in palm monoculture lands 1	Model 3b- Forage production and Agroforestry diversification in palm monoculture lands 2	Model 4- Micro-entrepreneur Business development	Model 5- Bee-keeping
Without Project										
Costs	\$R	-	-	-	5,158	5,650	4,068	138,847		
Sales	\$R	-	-	-	6,534	7,497	6,534	174,924		
Margins	\$R	724	2,171	2,171	1,376	1,847	2,466	36,077	34,452	1,080
With Project										
Costs	\$R	2,828	6,549	6,549	5,568	7,256	5,568	132,811	502,452	1,329
Sales	\$R	5,011	15,032	15,032	8,168	8,127	12,128	186,804	600,000	5,346
Margins	\$R	2,183	8,483	8,483	2,599	871	6,559	53,993	97,548	4,017
IRR	%	19.0%	39.0%	28.7%	14%	11%	19%	25%	10%	35%
NPV	\$R	5,734	33,958	27,054	7,268	2,322	11,224	40,018	39,521	219,941
Ratio B/C	N°	1.96	2.2	2.18	1.27	1.43	1.29	1.55	1.16	2.89

Table 7. Profitability indicators per model (B)

Model	IRR	NPV	Ratio B/C
Item	%	\$R	N°
Model 1a- Veg. Beds and Fruit trees 1- Grey Water Reuse	19.0%	5,734	1.96
Model 1b- Veg. Beds and Fruit trees 2- Other Water infrastructure	39.0%	33,958	2.21
Model 1c- Veg. Beds and Fruit trees 3- Cisterns	28.7%	27,054	2.18
Model 2a- Forage production and Agroforestry diversification in native lands 1	14.0%	7,268	1.27
Model 2b- Forage production and Agroforestry diversification in native lands 2	11.3%	2,322	1.43
Model 3a- Forage production and Agroforestry diversification in palm monoculture lands 1	18.8%	11,224	1.29
Model 3b- Forage production and Agroforestry diversification in palm monoculture lands 2	25.3%	40,018	1.55
Model 4- Micro entrepreneur Business development	10.0%	39,521	1.16
Model 5- Bee-keeping	35.1%	219,941	2.89

D. Economic analysis and sensitivity

24. **Economic analysis.** The economic analysis (with economic prices to calculate total economic costs) uses aggregated economic model's benefits (by beneficiaries) over the period of 20 years and at a shadow discount rate of 10%¹.

¹ Taking into account 10 year bonds yields for the country (between 9 and 10%).

Chart 1. Brazil Government Bond 10Yr (2013-2018)



25. To incorporate the results in the economic analysis all prices have been calculated applying conversion factors for imported tradable goods, exported goods and labour. No market distortions are supposed to affect non-tradable goods.

26. **Externalities/additional economic benefits.** Two different types of additional economic benefits were included: a) the family savings due to the implementation of efficient stoves, biogas digesters and other proven social technologies; and b) environmental externalities calculated using the Ex-Acte tool software to estimate the project's mitigation impact of avoiding CO2 emissions.

27. **Results.** The EIRR is estimated at 19,77% while the NPV reaches US\$ 152 million.

Table 8. Economic Results

NPV@10% (R\$ million)	\$684,020,261
NPV@10% (US\$ million)	152,004,502
EIRR (%)	19.77%
B/C Ratio	3.18

28. **Sensitivity Analysis:** A sensitivity analysis was carried out assuming different risk scenarios. These include an increase in project costs (10%, 20% and 50%), a reduction in project benefits (10%, 20% and 50%), delay in project benefits (1 and 2 years) and the occurrence of climate change extreme events (every 2, 3 and 4 years). The project is assumed to be profitable and resilient as it supports most of the tested scenarios as an increase in costs up to 30% or a reduce in benefits of 30%. Even in a case of a mixed increment in costs up to 20% and reduction in benefits up to 20%. In these cases, the NPV remains in positive range. The project wouldn't be profitable in a case of a mixed cost increase of 20% and a benefit reduction up to 30%. Besides, nine sources of benefits equally contributing to total project's benefits have been identified. This serves to demonstrate that the project is well diversified and not highly exposed to price or sectorial risks