TERMINAL EVALUATION REPORT

of the

MMA/UNDP/GEF Project

"Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga"
BRA/02/G31/1G/A/99
PIMS 609

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LIST OF ACRONYMS AND ABBREVIATIONS

AGENDHA – Advisory and Management on Nature Studies, Human Development and Agroecology

APNE – Northeast Plant Association

BNDES – Brazilian development Bank

CEPIS - Sustainable Industrial Production Center

CODEVASF - São Francisco and Parnaíba Valleys Development Company

CPRH – Environmental Agency of Pernambuco State

EMBRAPA – The Brazilian Agricultural Research Corporation

FNMA - National Fund for Environment

FSC - Forest Stewardship Council

GEF – Global Environment Fund

IBAMA – National Institute

INCRA - Land Reform Institute

INSA –National Institute of Semiarid

MCT – Ministry of Science and Technology

MDS – Ministry of Agrarian Development

MMA – Ministry of Environment

NWFP – non-wood forest products

PAC – Growth Acceleration Program

PRONAF – National Program the Strengthening of Family Agriculture

SBF – Forest and Biodiversity Secretariat (MMA)

SEBRAE – Brazilian Service of Support for Micro and Small Enterprises

SFB – Brazilian Forestry Service

SUDENE - Northeast Development Agency

UNDP – United Nations Development Program

UNESCO – United Nations Educational, Scientific and Cultural Organization

EXECUTIVE SUMMARY

The MMA/UNDP/GEF project "*Brazil: Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga*" started in January 2004 and, after an extended period of 2 ½ years, it finished in July 2010. The Project had a budget of USD 4,100,000 funded by GEF and a cost-sharing of USD 291,262 funded by the Brazilian Government. Additionally, a parallel financing of USD 22,033,000 was provided by other partners involved in the project implementation, at regional and national level. The project was implemented by the UNDP Country Office. The Executing Agency was the Forest and Biodiversity Secretariat (SBF), a body under the Ministry of Environment (MMA).

This project has been implemented in the Caatinga Biome, situated in the Brazilian Semiarid Northeast Region. The project aimed to develop a biome-level framework for the integrated ecosystem management of the Caatinga Tropical Dry Forest. To achieve this objective the project design considered the implementation of site-specific demonstrations areas at the State level and multi-sectoral capacity building actions to enhance replication throughout the biome.

The terminal evaluation was initiated by the UNDP Country Office of Brazil as the GEF Implementing Agency. The main purpose of this evaluation was to assess the project implementation successfulness regarding its objectives and the lessons learned.

The evaluation was performed by an external evaluator with the support of a project consultant responsible for the management of the M&E system. The methodology was based on project documentation desk review and interviews with representatives of local communities, key project informants and project staff. The evaluation report was structured around the GEF five major evaluation criteria: Relevance, Effectiveness, Efficiency, Results/Impacts and Sustainability

The **main findings** of this evaluation are:

The Project conceptualization and design were satisfactory. The design was technically good though the timing and the geographic coverage were ambitious in relation to the amount of financial resources available. The project execution strategy was well design, considering the establishment of partnership with different kind of institutions – NGOs, research institutions and governmental agencies. This network approach provided the conditions to scale up project outcomes and to overcome staff and financial resources constraints. However, the gap between project conceptualization and project approval required some adjustments during implementation.

The project was highly relevant in meeting the objectives of international treaties like the UN Convention on Biological Diversity, the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification. The project responded to the development objectives of Brazil, meeting the needs of the target beneficiaries. However, lack of monitoring data prevents to present enough quantitative evidences of global benefits.

The dissemination of the sustainable *Caatinga* forest management and the green energy approach has been the major contribution of this project. Despite shortcomings faced during implementation, the project was satisfactorily effective in achieving its expected outcomes.

The sustainability and persistence of project outcomes depend on several factors. It could be improved whether the government internalizes the project approach and outcomes. Otherwise, replication and scaling up will be restricted to the capacity of project partners. Considering the opportunities for funding opened after project ending and the recent progress in the governmental agenda, the sustainability is rated as satisfactory.

Based on the evaluation findings, the following **recommendations** are presented:

- Ensure ownership and maintenance of project data by the Ministry of Environment.
- Provision of extra funding for follow-up of documentation activities.
- Provision of extra funding for follow-up of training activities.
- Continuous efforts to include the sustainable forest management as part of credit lines already available, such as PRONAF and Rural Credit. This is an essential step to scale-up sustainable wood managed areas and to create more incentives for sustainable management of NWFP.
- Continuous efforts to expand credit lines for investments in energy efficient, considering special lines oriented to small scale industries.
- Continuous efforts to build up institutional capacity of governmental agencies at State level on forestry management issues, including project analysis and issue of permits for forestry management plans, as well as surveillance and monitoring services.
- Continuous efforts to include the sustainable forestry management in the research agenda, especially the NWFP. The experience of project partners and local communities should be considered in defining research priorities.
- Consider the local communities when planning the creation of protected areas in the Caatinga Biome. The semiarid region of Brazil is densely populated and ignoring the presence of inhabitants in the remaining forest areas does not secure Caatinga forest protection.

The following **lessons** were identified:

- The time gap between formulation and implementation affects project results. Very often this delay requires adjustments that are time-consuming, with implications on the implementation strategy and institutional arrangements built during the formulation phase.
- The design of projects involving innovative concepts and practices, which scaling-up depends on changes in the regulatory framework and new institutional capacities, should better take into account the timeframe and budget.
- The less mainstreamed the project is within the executing agency, the more difficult to implement it. Lack of political support let project managers in an isolated position, constraining institutional ownership of project results.
- Project logframe and M&E matrix should be developed in the early stages, in a participatory way, ensuring ownership of project managers and partner organizations.
- A decentralized strategy and multi-stakeholder involvement in project implementation through sub-projects increase the sustainability and reduce the risks associated with shortcomings at executing agency level. Partners that share project vision and have dense social networks among potential beneficiaries are the most eligible for implementation of sub-projects.

- Decentralized and multi-sites projects require a well designed communication system, which has to be part of the project logic. This is a condition for ensuring timely exchanges between project partners and project coordination, as well as among project partners.

- The network approach is a strategic element for project implementation. The network action enables sharing and expansion of existing capacities, increasing project efficiency and efficacy.

- Minor technological improvements in gysium/bricker/tile industries can increase energy efficiency. However, adoption of these technologies by small scale industries depends on access to credit and technical assistance.

- Sustainable management of Caatinga forestry resources can be technically and economically feasible option, both for wood and non-wood species. However, scale up depends on adjustments on regulatory framework, dissemination of technical capacity, financial support and access to market.

- Non-wood forest products from Caatinga forest have great potential for income generation, especially after investments on processing units that add value to these products. Therefore, projects should consider the whole production chain, including processing and market.

- Local communities can be important allies of Caatinga forest protection. The strategies that ensure early stakeholders involvement in protected areas design and provide support for sustainable management of buffer zones are more effective.

1. INTRODUCTION

1. This report presents the findings of the terminal evaluation of the MMA/UNDP/GEF project "*Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga*" (UNDP PIMS#609), also called GEF Caatinga Project.

2. This project has been implemented in the Caatinga Biome, situated in the Brazilian Semiarid Northeast Region, as a partnership between the Ministry of Environment- MMA, UNDP and GEF. The project aimed to develop a biome-level framework for the integrated ecosystem management of the Caatinga Tropical Dry Forest. To achieve this objective the project design considered the implementation of site-specific demonstrations areas at the State level and multi-sectoral capacity building actions to enhance replication throughout the biome.

3. This report includes six sections. This chapter briefly describes the objective, methodology, evaluation questions and limitations of the evaluation. Chapter 2 presents an overview of the project; chapter 3 presents the evaluation findings for each output. Conclusions and recommendations are presented in chapter 5. Finally, chapter 6 presents the lessons learned.

1.1. Purpose of the evaluation

4. The terminal evaluation was initiated by the UNDP Country Office of Brazil as the GEF Implementing Agency. The main purpose of this evaluation was to assess the project implementation successfulness regarding its objectives and the lessons learned.

5. Due to changes in the Brazilian government and changes in the project timeframe, the evaluation was performed 6 months after the completion period by an external consultant with the support of an internal consultant[1] responsible for the management of the M&E system.

1.2. Evaluation questions

6. The evaluation questions were defined considering the project overall objective:
   - To what extent has the project contributed to a development of a biome-level framework for the integrated ecosystem management of the Caatinga Tropical Dry Forest?
   - To what extent has the project contributed to an increase in the sustainability of development and poverty alleviation programs?
   - To what extent has the project contributed in generating multiple global benefits in terms of climate change, biodiversity, land degradation and watershed management?

1.3. Methodology

7. The evaluation was performed by an external evaluator with the support of a project consultant responsible for the management of the M&E system. The project consultant was responsible for organizing quantitative information, including those available in the M&E system as well as consultation with external sources. This information was summarized according to the main indicators present in the project logframe.

8. The external consultant carried out desk review of project reports, revision of data gathering from the M&E system, and interviews with representatives of local communities, key project

[1] Ms. Ana Tres Cruz – project consultant responsible for the M&E system.

informants and project staff. The findings were triangulated with the use of multiple sources of information as much as possible.

9. Therefore, the findings and conclusions contained in this report rely primarily on desk review of project documents, a quantitative report prepared by the project consultant responsible for the M&E system, and interviews with project partners, project managers and beneficiaries. These interviews included the consultations with representatives from UNDP and GEF, interviews with the project regional coordinator, four technical officers of the Ministry of Environment, one government officer from Sergipe State, two project consultants, five representatives of three partner organizations, focus group with project staff, and three focus groups with project beneficiaries from two sites (see annex 1).

10. A feed –back session was organized before the final version for validating the conclusions with project partners. This meeting joined project staff, project consultants, representatives from the Ministry of Environment, governmental representatives from the State of Sergipe, and representatives from two partner organizations.

11. The evaluation report was structured around the GEF major evaluation criteria:

- **Relevance.** The extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time.
- **Effectiveness.** The extent to which an objective has been achieved or how likely it is to be achieved.
- **Efficiency.** The extent to which results have been delivered with the least costly resources possible; also called cost effectiveness or efficacy.
- **Results.** The positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention, including direct project outputs, short- to medium-term outcomes, and longer term impact including global environmental benefits, replication effects, and other local effects.
- **Impacts.** Long term results of the project, including global environmental benefits, replication effects, and other local effects.
- **Sustainability.** The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion, considering the environmental as well as financial and social dimensions.

12. These criteria and project outcomes were rated as follows:

- **Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- **Satisfactory (S):** The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- **Moderately Satisfactory (MS):** The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- **Moderately Unsatisfactory (MU):** The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- **Unsatisfactory (U)** The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- **Highly Unsatisfactory (HU):** The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

13. In addition to the principles and evaluation criteria defined by GEF, the methodology considered also the participatory approach. Therefore, the process of inquiry tried as much as possible to understand project partners, managers and beneficiaries' viewpoint.

1.4. Limitations and constraints

14. Considering the geographic coverage and project scope, the time and personnel available for carrying out the evaluation were not enough to cover all issues deeply. The project objectives are very ambitious and a proper impact analysis would require more time, an evaluation team and specific methods of enquiry.

15. The evaluation was carried out during the end of November and beginning of December, a critical period of the year in terms for all project partners. This fact limited the time availability of key-informants to be involved in the consultation process.

16. Information gaps in the monitoring system created some difficulties to obtain quantitative evidences, delaying the conclusion of the evaluation report. During the evaluation process, the internal consultant hired to support the external evaluator put efforts on data gathering, including consultation of external sources. However, fragility in the statistics services managed by Brazilian institutions prevented access to useful data for impact analysis.

2. PROJECT OVERVIEW

17. The MMA/UNDP/GEF project "***Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga***" started in January 2004. The first year was used to organize the operational structure and to establish agreements with local partners in each project site. The field activities started in January 2006 and after an extended period of 36 months, the project ended in June 2010.

18. The Project had a budget of USD 4,100,000 funded by GEF and a cost-sharing of USD 291,262 funded by the Brazilian Government. Additionally, a parallel financing of USD 21,420,000 was provided by other partners involved in the project implementation, at regional and national level.

19. UNDP was the implementing agency. The Executing Agency was the Forest and Biodiversity Secretary (SBF), a body under the Ministry of Environment (MMA). The project management structure included a national coordination based in Brasilia at the Ministry of Environment head quarters and a regional coordination based in Recife, Pernambuco, closer to the implementation sites. This regional coordinator had a seat at the Caatinga Working Group, a forum created by the Ministry of Environment to follow project activities.

20. The project main goal was to develop a biome-level framework for the integrated ecosystem management of the Caatinga Tropical Dry Forest. To achieve this objective the project design considered the implementation of site-specific demonstrations areas and multi-sectoral capacity building actions to enhance replication throughout the Caatinga biome. The expected result was to increase the sustainability of development and poverty alleviation programs, generating multiple global benefits in terms of climate change, biodiversity, land degradation and watershed management.

21. The following outputs were established:
(i) **Output 1**: Integrated management options tested, demonstrated and adapted for different socio-environmental scenarios of the Caatinga Biome;
(ii) **Output 2:** Techniques and practices for increasing the efficiency of wood transformation demonstrated and adopted by the charcoal, brick, tile and plaster industries in four Priority Areas with the aim of reducing carbon emissions and increasing the sustainability of the region's energy matrix;
(iii) **Output 3**: Three ecological corridors with a mosaic of protected areas of different categories and sustainable land-uses, created as a strategy for conservation of biodiversity at the landscape level;

(iv) **Output 4**:Incentives for Caatinga integrated ecosystem management created and tested at the biome level;
(v) **Output 5**: Multi-sectoral capacity developed for integrated ecosystem management;
(vi) **Output 6**: Knowledge base developed to enhance the adoption of integrated ecosystem management of the Caatinga at the Biome level and to determine the national and global benefits that could be derived from this.

22. The project consisted of several activities such as research, demonstration plots, public awareness, policy advocacy, training, knowledge development, and information dissemination. A detailed description of output targets and indicators defined during the project formulation phase is described in table 1.

23. Initially, the project was designed considering two implementation phases. The Phase 1 would be implemented in nine priority areas (Figure 1) in according to previous definitions of priority conservation areas for Caatinga Biome. The Phase 2 would work on the remaining priority areas not covered during the phase 1. However, changes and adjustments were necessary and the project worked on five sites: Xingó Region, Araripe Region, Cariri Paraibano, Seridó Region and Ibiapaba Region. These sites are numbered in the Figure 1 as Priority Areas #3, 7, 8, 9 and 12, respectively.

24. The implementation strategy involved partnership with organizations based in each priority area and with complementary institutional capacities. These local implementing agencies included NGOs working directly with rural communities (Araripe Foundation, Advisory and Management on Nature Studies, Human Development and Agroecology- AGENDHA, and Jurema Institute Jurema); research NGOs (Northeast Plant Association – APNE, Esquel Foundation) and environmental organizations (Caatinga Friends Institute).

Table 1: GEF Caatinga Project logframe

Intended Outputs	**Output targets for (years)**	*Indicative Activities*
Output 1: Integrated management options tested, demonstrated and adapted for different socio-environmental scenarios of the Caatinga Biome **Component A: Wood products** Integrated management options for the sustainable production of wood integrated with conservation in PIA of high demand, high supply and varied desertification risks. **Component B: NWFP** Integrated management options for the sustainable production of non-wood forest products integrated with conservation in PIA of medium to low demand & supply and varied desertification risks	*At the end of phase 1:* A-1. 7 % of the Caatinga in the PIA of Araripe and 10% in PIA South eastern Bahia is under sustainable management for wood production; A-2. 50% (600) of the producers of stacks from sabiá trees (*Mimosa caesalpinifolia*) are employing sustainable management techniques in the PIA Ibiapaba/Poti/Inhamuns; A-3. 12 areas are established in PIA Petrolina for demonstrating the recovery of degraded areas, the production of wood for fruit boxes and agroforestry systems; A-4. Guidelines published and disseminated for recovery of degraded land, wood production for fruit boxes and agro-forestry systems in the Caatinga. B-1. Methodology and criteria for sustainable angico bark extraction defined and disseminated amongst the producers in the PIA Cariri Paraibano; B-2. Small-scale producers in PIA Araripe communities organized for the production of NWFP, mainly oil, medicines and seeds. ***B-3.*** Sustainable extraction methods for three NWFP (Pequí, Janaguba and Fava d'anta developed and disseminated n PIA Araripe.	1.1 Demonstrate forest management for sustainable production of wood for industries in 2 PIAs 1.2 Test different sustainable production practices for sabia for stacks and agricultural use in 1 PIA 1.3 Test reforestation techniques for multiple uses including recovery of degraded areas in 1 PIA 1.4 Demonstrate & strengthen the community management of commercially known NWFP in 1 PIA 1.5 Determine sustainable methods & rates of extraction for angico tree bark for tanning industry in 1 PIA 1.6 Co-ordination and project implementation, monitoring and evaluation for this Output
Output 2: Techniques and practices for increasing the efficiency of wood transformation demonstrated and adopted by the charcoal, brick, tile and plaster industries in four PIAs with the aim of reducing carbon emissions and increasing the sustainability of the region's energy matrix	*By the end of the second year* 1. 8 efficient charcoal production demonstration ovens set up in the PIA Southern Bahia *By the end of phase 1* 2. 40% (80) of the brick and tile industries in the Seridó and Cariri Paraibano PIAs have adopted techniques to increase energy efficiencies; 3. 30% (45) of the plaster industries in PIA Araripe have adopted improved wood management in the drying yard and in the burning process 25% of the charcoal production in PIA Southeast Bahia comes from improved charcoal kilns	2.1 Demonstrate and disseminate the use of energy efficient charcoal ovens in 1 PIA 2.2 Evaluate & demonstrate techniques for improving firewood efficiency in plaster industry in 1 PIA 2.3 Demonstrate and disseminate techniques for improving firewood efficiency in brick and tile industries 2.4 Co-ordination and project implementation, monitoring and evaluation for this Output

Table 1: GEF Caatinga Project Logframe (continue)

Output 3: Three ecological corridors with a mosaic of protected areas of different categories and sustainable land-uses, created as a strategy for conservation of biodiversity at the landscape level • Peruaçu Jaiba Corridor in Minas Gerais; • Xingo Corridor in the Sertão of Alagoas, Bahia Sergipe; • Serra da Capivara/ Serra das Confusões Corridor in Piaui	*By end of year 1* 1. Study of the contribution and role of forest recourses in the family income realized for communities in the PIA Serra da Capivara/Serra das Confusões; *By the end of year 2* 2. Studies required for the creation of a Biological Reserve in PIA Xingo finalized with clear definition of potential location and boundaries. 3. Basic information available for developing management plans for the Conservation Units in Peruaçu/Jaíba, Parque das Capivaras/Confusões 4. Harmonized management criteria and procedures available for federal, state and municipal conservation units based on pilot study in Peruaçu-Jaíba *By end of phase 1* 5. 15 pilot areas set up to demonstrate multiple use forestry management (agrosilvopasture purposes) in the Xingo Corridor 6. 6 pilot areas set up to demonstrate multiple-use plantations (forage, stacks and firewood producing trees) in the Peruaçu-Jaíba corridor; 7. 30% of rural land owners have adopted techniques in pilot demonstrations in the corresponding corridors; 8. A total of 18 new private reserves have been created in the three ecological corridors	3.1 Establish Xingo corridor: Creating a UC, supporting legal reserves & silvopasture practices 3.2 Establish Peruaçu/Jaiba corridor: Harmonizing management existing UC & multiple use plantations 3.3 Establish Capivara/ Confusões corridor: Community participation in management & reducing hunting 3.4 Evaluate ecological corridors role protecting ecosystem integrity & consolidating Biosphere Reserve 3.5 Implement private reserves program informing on mechanisms & benefits these bring land-owners 3.6 Co-ordination and project implementation monitoring and evaluation for this Output
Output 4: Incentives for integrated ecosystem management of the Caatinga created and tested at the biome level	*By the end of year 1* 1. A simplified credit line for different management options of the Caatinga created and under operation at a pilot level but available for the whole biome; 2. The FNMA will open specific funding lines for small scale projects on sustainable use and conservation of Caatinga biodiversity at least three times a year throughout the phase 1 *By end of Phase 1* 3. The number of projects spontaneously sent to FNMA by NGOs and governmental organization working in the Caatinga has increased by 30% 4. An ecological ICMS tax is adopted and in operation in 2 of the Caatinga States and another 2 States are in the process of adopting it; 5. Agreements in place that permit the resources from forestry replacement surcharges to be used for forestry management projects 6. New fiscal incentives for the sustainable use of natural resources in the Caatinga identified and their adoption in process or planned 7. The number and type of wood and non-wood Caatinga forest products sold in the market increases steadily throughout the project; 8. There is an increase in the number of certified areas under sustainable management	4.1 Strengthen FNMA for replication tool of successful integrated ecosystem management experiences 4.2 Create simplified access credit line with criteria including sustainable forestry firewood & NWFP 4.3 Develop tax-related incentives to aid adoption of integrated approaches to Caatinga management 4.4 Develop certification schemes for consumers of wood from sustainable management program 4.5 Identify & develop value-added wood products to reduce dependency on wood for fuel 4.6 Co-ordination and project implementation monitoring and evaluation for this Output

Table 1: GEF Caatinga Project Logframe (continue)

Output 5 Multi-sectoral capacity developed for integrated ecosystem management	*By the end of year 2* 1. A register of producers and consumer centers of forestry products will have been established *By end of phase 1* 2. There will be a steady increase in the area under sustainable management in PIAs and a 10% & 30% increase in the volume of wood legalized by IBAMA and State Environmental Agencies 3. 3 Caatinga States will have signed the Federal Pact; 4. Increase in the number of NGOs working with sustainable use of forestry resources; 5. Increase in the number of municipalities that undertake sustainable use and conservation projects; 6. Forestry division created in State Environmental Agencies and applying sustainable techniques developed through project 50 courses implemented to State & Municipal, technical staff, planners and decision makers in the 8 PIAs. 12 on forestry alternatives & ecological services in the semi-arid; 12 on production of value-added wood products; 12 on sustainable forestry management practices; 6 on integrated ecosystem management; 8 on integrated agrosilvopasture alternatives to reduce deforestation.	5.1 Remove barriers impeding forestry legislation application (consumers register & awareness campaign) 5.2 Providing support to develop State Forestry Laws in the 6 States thus facilitating decentralization 5.3 Create Caatinga Natural Resource Regional Forum for lesson-interchange & stakeholder co-ordination 5.4 Implement biome-wide awareness building campaign on Caatinga forest role in ecological services 5.5 Implement capacity-building for decision-makers & planners on integrated ecosystem management 5.6 Implement rural producers capacity-building program on sustainable forestry & forest products 5.7 Incorporate lessons learnt on integrated management options to Serido's Regional Development Plan 5.8 Co-ordination and project implementation monitoring and evaluation for this Output

Table 1: GEF Caatinga Project Logframe (continue)

Output 6: Knowledge base developed to enhance the adoption of integrated ecosystem management of the Caatinga at the Biome level and to determine the national and global benefits that could be derived from this.	*By end of year 1* Monitoring system designed and operational with baseline information for project indicators and consensus on methods for the precise measurement of global benefits derived from phase 1 action particularly in climate change benefits and land degradation. By the end of phase 1 this system will have sufficient information to for projecting the benefits of future phases. Management Information System operational producing semester and annual progress reports as an input to project monitoring and evaluation *By the end of year 2*, Key information available to determine locations biome wide for the replication of each management option (definition of socio-environmental scenarios). Market study for present and potential wood and non-wood Caatinga forest products available to stakeholders through the CDSC; Inventory of non-wood forest products with processing and commercialization potential available to stakeholders through the CDSC; *By the end of phase 1* GIS operational, up-dating and processing new information on the integrated management of Caatinga resources and providing this information to different stakeholders; 7. Reference centre on sustainable management options for the Caatinga operating with mechanisms for consolidating, processing and disseminating lessons learnt from the project actions.	6.1 Complete information gaps critical for implementing integrated ecosystem management at biome level 6.2 Implement monitoring system to measure the global & national benefits from integrated management 6.3 Create Reference Centre for Sustainable Use of Caatinga Natural Resources aiding integrated approach 6.4 Co-ordination and project implementation monitoring and evaluation for this Output

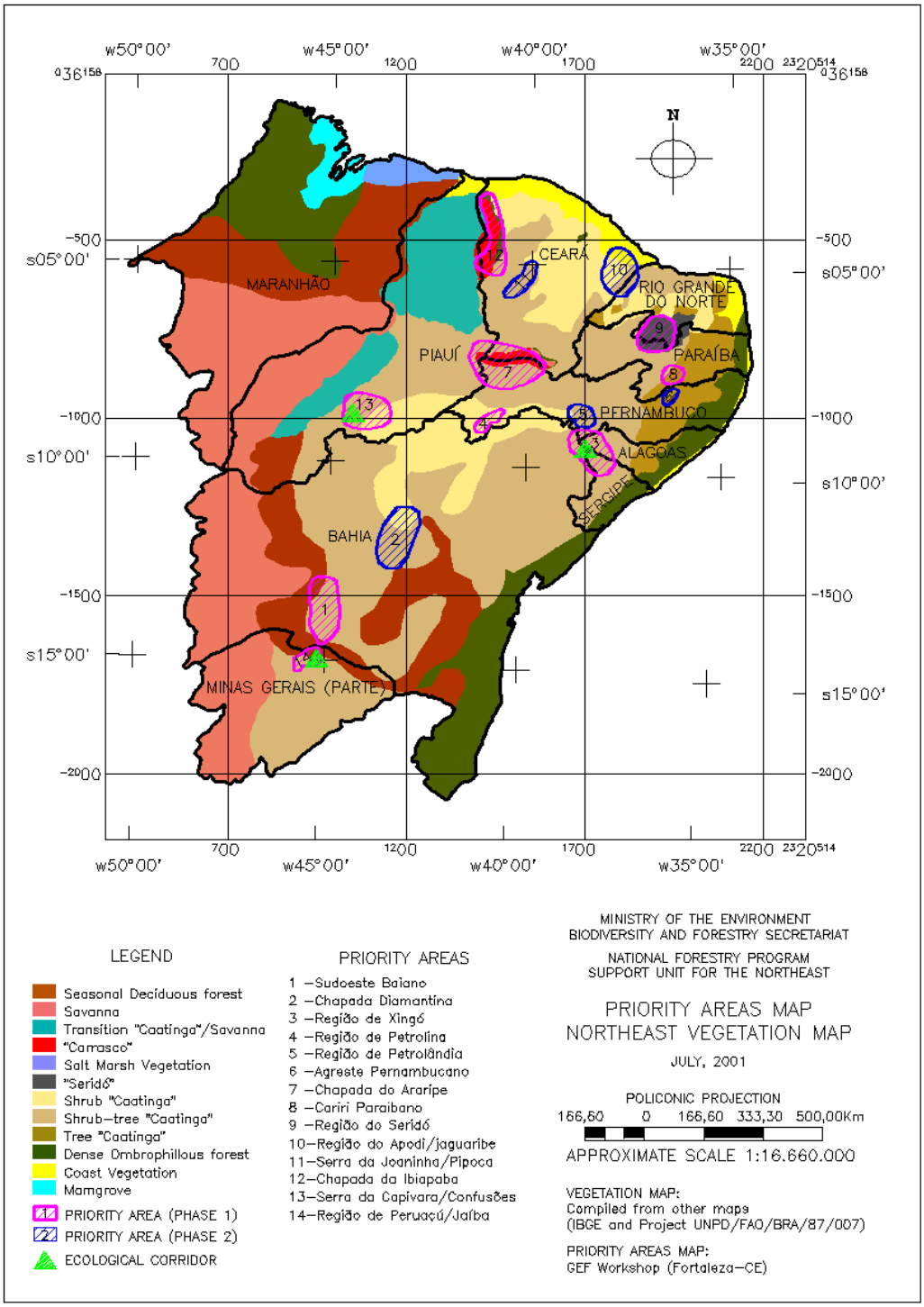

Figure 1: Priority areas for implementation of GEF Caatinga Project

3. EVALUATION FINDINGS

25. This section presents the findings of this evaluation, considering the project formulation, implementation, results and sustainability.

3.1. Project Formulation

26. The project conceptualization and design were **satisfactory**. The design was technically good though the timing and the geographic coverage were ambitious in relation to the amount of financial resources available.

27. The project execution strategy was well design, considering the establishment of partnership with different kind of institutions – NGOs, research institutions and governmental agencies. This network approach provided the conditions to scale up project outcomes and to overcome staff and financial resources constraints.

28. The project target – *The Caatinga Biome* – is highly relevant from the social, economic and environmental perspective. It means that **the project was highly relevant** in meeting the objectives of the UNCBD, the UNDP and GEF, in responding to the development objectives of Brazil and in meeting the needs of the target beneficiaries. It also addressed issues related to the climate change and desertification, being in line with other international agreements signed by the Brazilian government such as the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification.

29. The project design process included consultation with a broad range of stakeholders, involving governmental officers from State and Federal level, experts from Universities, and representatives from civil society and private sector. During the conception phase, a consultation seminar was organized involving representatives from 70 institutions, both from governmental and non-governmental sector. This seminar indicated the big challenges for biodiversity conservation in the Caatinga Biome, contributing to the definition of the project main objectives. Another smaller seminar organized in 2001 joined governmental officers and NGO experts do define the project site areas. Therefore, the process of consultation ensured a highly **satisfactory stakeholder participation** in design stages.

30. The strategy applied to design this project was replicated by other projects. The government of Pernambuco and Sergipe State used the same approach to develop the State Plan to Combat Desertification. The "*Mata Branca*" Project supported by the World Bank used the same implementation strategy applied by the GEF Caatinga Project, decentralizing implementation through sub-projects. The Ministry of Environment also used this same strategy at least in two other projects. The same approach is being considered for another project that is being formulated by UNDP and FAO.

31. UNDP played an important role as the implementing agency, giving substantial inputs during the conceptualization stage. UNDP political neutrality was important to facilitate dialogue among different sectors within Brazilian government. Additionally, the UNDP Country Officer provided liaison between different partners, sharing its own network in Brazil and promoting exchanges between different projects working in similar issues.

3.2. Project Implementation

32. The three years' time gap between project conceptualization and project approval required some adjustments during implementation. These adjustments included changing sites, partners and activities. Dollar devaluations that occurred during this period resulted in US$ 1 million losses, reducing the budgetary provisions. Additionally, Brazilian norms changed during this period creating barriers to hire a project team as was predicted during the formulation phase.

33. Despite its broad objectives, large spatial coverage, small coordination staff and reduced budget, the **project was satisfactorily implemented**. However, lack of internalization of the project by the headquarters of the Ministry of Environment created some difficulties for implementation. The coordination team operated in reduced capacity, overloading the project staff. Certainly, the creativity and commitment of the coordination team and the engagement of partners were key factors to overcome these barriers.

34. At the time of the project implementation, its subject – *Sustainable Management of Caatinga Forest* - was not internalized properly by the Ministry of Environment. In fact there were a lack of visibility, knowledge and understanding of the complexity of the *Caatinga* Biome at the Ministry's officer's level. This fact lead to a lack of political support from the Execution Agency main officer (SBF/MMA), interfering negatively in the project implementation.

35. First of all, the Execution Agency main officer and the project technical coordination did not share the same approach regarding sustainable wood management. An internal dispute involving a large scale sustainable forestry management in Piaui State confirms this statement. The project established a partnership with a private farm to implement a pilot large scale project on sustainable wood management. This initiative would be an alternative for deforestation of Caatinga forest, a common practice in the region. However, the Execution Agency main officer did not give the permits and the experience was aborted. This conflict interfered in the project coordination structure, delaying the implementation of some activities and aborting others.

36. It was not possible to implement activities in all sites. Despite the efforts in the design phase to select the project partners, the Execution Agency main officer did not accept NGOs as implementation partners, delaying agreements signature for almost one year. In 2005, the first substantial review reduced the implementation sites to four - Cariri, Seridó, Araripe, Xingó and Ibiapaba. The partner organizations was also reduced to six, including three NGOs working directly with local communities – The Araripe Foundation, Agendha and Jurema Institute-, two research organizations – Northeast Plant Association – APNE and The Esquel Foundation -, and one environmentalist NGO – Caatinga Friends Institute.

37. Additionally, the project signed memorandum of understanding (MoU) with other organizations to carry out specific activities. These MoU involved IBAMA in Capivara-Confusões region; CEPIS and SEBRAE in Seridó and Araripe Region; Barra Municipality from Bahia State and JBCarbon in Piauí State.

38. Changes in Brazilian rules regarding hiring of consultants also affected the implementation. The project staff was reduced to four people transferred from other governmental institutions to carry out project activities. Therefore, instead of to have a full time technical team, the project had to hire short term consultants for specific activities.

39. In general terms, the partnership was satisfactory. The majority of project partners contributed positively with their social capital, enhancing the capillarity of project outcomes. Partner organizations such as AGENDHA and Araripe Foundation gave important counterpart to the project, providing a liaison with local communities and grassroots organizations. APNE provided

scientific support to improve knowledge development and sharing on sustainable forestry management practices.

40. The partner organizations were accountable to the Regional Coordinator, which was responsible for the technical coordination, planning, supervision, monitoring and execution of cross-sectoral activities. The Regional coordination was accountable and supervised by the national coordinator hosted by the Executive Agency.

41. The **monitoring and evaluation framework was moderately unsatisfactory**. The project developed an electronic management system opened to all project partners. Whether this system was a useful tool for documenting and sharing information among partners, it has failed as a monitoring tool. Lack of resources lead to interruption of updating the system before the end of the project. The M&E framework developed by an external consultant in the beginning of the project implementation was not properly internalized by the coordination team and the project partners. The proposed indicators were not the best one for a results oriented management approach. The weakness of the M&E system was explicit during the terminal evaluation, creating many difficulties to track results based on the defined indicators.

42. Three evaluations meetings were carried out during project implementation. Additionally, in 2006, an external evaluator carried out a midterm review. However, the proposed recommendations were not considered feasible by the project team and partners. Regarding the operational issues, six substantial reviews were carried out resulting in changes in partners and project schedule.

43. Regarding planning activities, initially all project partners and consultants prepared planning and reports monthly. These documents were shared through e-mail and later they were uploaded to the management system available in the internet for project partners. Based on this information, the Regional Coordinator prepared the annual planning. Activities development assessment was carried out annually before preparing the PIR and the progress report requested by the Brazilian Cooperation Agency (ABC).

44. The **stakeholder participation** during the project implementation was **satisfactory**. The coordination team established a strong relationship with project partners, keeping a good information flow. Partners provided reports periodically, which were shared at the management system platform. However, the exchanges between partners were restricted to a few meetings. In general terms, project partners did not get an overall view of the project coverage and outcomes. The great geographic distance between project sites created difficult for bilateral exchange among partners. Consequently, partners' ownership was restricted to issues they worked with.

45. Beyond the direct partners, the coordination managed to disseminate project concepts and outcomes to several other institutions. Contacts with researchers and Universities provided support to training activities without additional financial costs. The project coordinator participated as speaker in several Conferences and Meetings, promoting the sustainable management of *Caatinga* forest and disseminating project outcomes. These meetings included international events such as the Sixth Conference of Parties of the Convention on Biological Diversity and the Second International Conference on Climate, Sustainability and Development in Semi-Arid Regions – ICID.

46. The project has achieved great press coverage, in radio, television and newspapers. Initiatives supported by the project such as the network of non-wood forestry products "*Bodega da Caatinga*" has obtained great visibility at national and international level (see more details in Output 6).

47. The project established partnership with governmental bodies at State level to develop the regulatory framework and forestry management plans. This strategy improved the involvement of stakeholders substantially.

48. UNDP played a central role on administrative issues, supporting the project coordination in the financial management. Moreover, the UNDP Environmental Unit provided relevant technical support to the project coordination, participating actively in the project concept development, monitoring and reviews. Due to its large contacts network, UNDP promoted liaison with other projects and other important stakeholders, both at national and international level.

49. The project started with a budget of US$4,391,262 considering financial resources provided by GEF and the Brazilian Government. During project implementation, the Ministry of Environment managed to obtain additional funding, adding more US$510,000 to the original budget. Therefore, the project operated an amount of US$4,901,262 (Table 2).

Tabela 2: Project actual budget (US$) including additional funding provided by the Brazilian Government during project implementation

Institution	Source of financial resources	Project Budget US$	Additional resources US$	Total Budget US$
GEF	GEF	4,100,000	0	4,100,000
Brazilian Government	Ministry of Environment, Germany	0	90,000	90,000
	Ministry of Environment, Brazil	291,262	420,000	711,262
TOTAL		**4,391,262**	**510,000**	**4,901,262**

50. The funds disbursement is described in Table 3. According to this data, 52% of project budget were expended during the third and fourth year. Budgetary reviews were carried out annually, and remaining funds were transferred to the next year. In the end of the project implementation there were some delays in GEF transfers. Budget changes proposed during substantial reviews were approved in accordance with UNDP, Ministry of Environment and Brazilian Cooperation Agency.

Table 3: GEF Caatinga Project disbursement of funds

Year	Disbursement US$	% Total	% Total Accumulated
2004	108,466	2.2	2.2
2005	810,813	16.5	18.7
2006	1,198,531	24.4	43.1
2007	1,373,187	28.0	71.1
2008	882,562	18.0	89.1
2009	432,548	8.8	97.9
2010	104,000	2.1	100
TOTAL	**4,910.109**	**100**	

51. UNDP was responsible for the financial management, sharing some tasks with the regional coordination. Project expenses were registered in the accounting system by the regional coordination, which could authorize expenses by U$10,000. Expenses above this value depended on UNDP authorization. The UND acquisition unity was responsible for goods acquisitions (such as vehicles and equipments) and hiring consultants after requests from the regional coordination. UNDP provided financial transfers to implementation partners after approval of activities reports by the regional coordinator. According to project team and project partners consulted during this evaluation, this process worked timely and satisfactorily.

52. The accounting and financial system used by the project management team was satisfactory. UNDP used the SAP system by December 2007, which distributed the costs according to budgetary input line. In January 2008, UNDP changed to UN ATLAS system, which allocated budget expenses by activity. This system provided accurate and timely financial reports for the regional coordination.

53. However, due to operational problems, after the implementation of the UN ATLAS system all project expenses were allocated to the Output 1, not allowing financial analysis by each output. In order to get enough information to carry out the financial analysis, data from the ATLAS system were disaggregated and crossed with the agreements established with each implementation partner, consultant contracts and MoUs. After tracking these sources of information it was possible to assess the budgetary sharing of U$3.2 million or 66% of actual budget.

54. Therefore, the available financial information did not allow an assessment of the actual project cost by output. Considering the 66% budget available data, the estimated distribution of expenses among the five project outputs and transversal activities are those describe in the figure 1. The major part of the budget was expended with activities related to Output 1, Output 6 and Output 5, corresponding to 64% of financial resources. Output 1 involved activities related to the promotion of sustainable forestry management, including both wood species (Output 1-A) and non-wood species (Output 1-B). The Output 5 related to multi-sectoral capacity was responsible for 18% project budget.

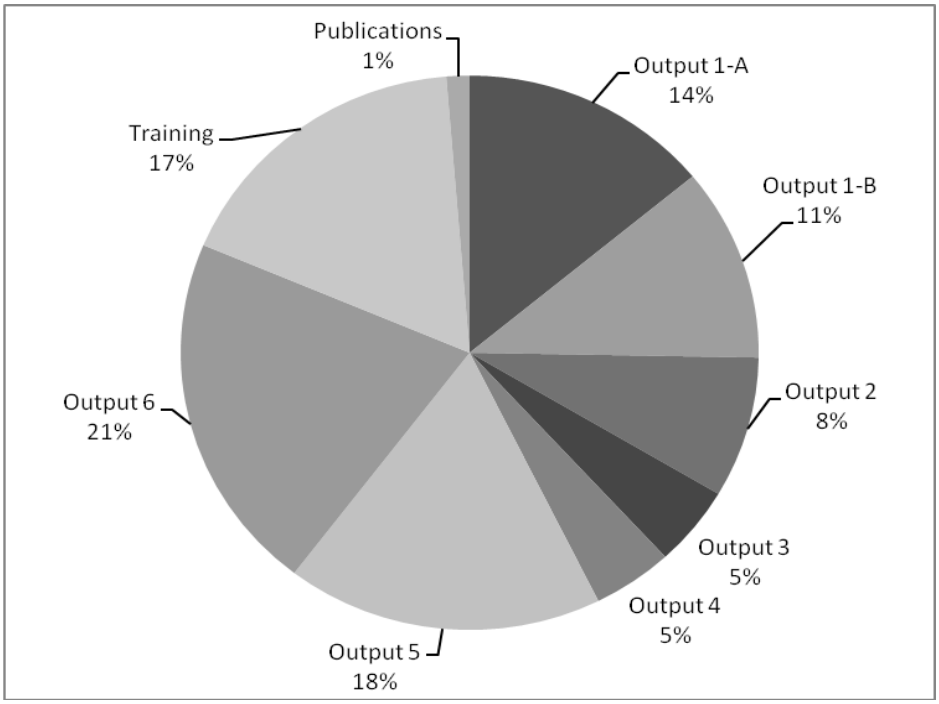

Figure 2: Estimated budget sharing among project outputs and transversal activities – training and publications.

(Source: organized from data gathered from UNDP Atlas system).

55. Lack of actual information did not allow a precise cost-effectiveness evaluation. However, considering the project achievements and the conditions for implementation – large territorial coverage, small coordination team-, it seems the project was cost-effective. Despite the small team – only four people, the expenses with consultants corresponded only to 12.8% of the total budget. The financial transfers to implementation partners and sub-projects corresponded to 25.7% and 14.5% of the total budget, respectively. Transversal activities such as training and publication

corresponded to 17.4% and 1.3% of the total budget, respectively.
56. The efforts of the regional coordination and UNDP to get the best value for the project lead them to establish several partnerships with Universities and research institutions, reducing the expenses with consultancy services for training activities. UNDP administrative fee corresponded to 3% of total budget, value lower than those applied by other agencies.

57. The project was audited by the Brazilian Government (CGU) several times and no irregularities were found. Recommendations resulted from the auditing were incorporated by the regional coordination, such as improvements in the selection of consultants and small changes in the acquisition procedures.

3.3. Project Results

58. Considering the information available the project was effective in achieving its expected outcomes and its **effectiveness is rated as satisfactory.** A detailed analysis of project results is described below.

*3.3.1.**Output 1:** Integrated Natural Resources Management Options Demonstrated and Adapted for the Different Socio-environmental Scenarios of the Caatinga biome*

59. The implementation of demonstration areas was the starting point to disseminate sustainable management practices, both for wood and non-wood species. In relation to the wood species, seven demonstration plots were established in Araripe Region by the project partner Araripe Foundation, occupying 8,350 hectares. The demonstration plots were managed in private farms, including several training activities for farmers, technical staff from governmental institutions, NGOs, undergraduate students and industry managers. Additionally, the data gathered in these demonstration plots were widely disseminated by the project regional coordination in conferences and other technical events.

60. The results obtained in Araripe Region motivated a partnership with the NGO SOS Sertão and brick industries to support the implementation of 2,500 hectares in Serido Region, Rio Grande do Norte State. This area was not a demonstration plot, but a managed area to supply 18 local brick industries with sustainable forestry raw material. This initiative attracted the attention of the Brazilian Support Service to Micro and Small Enterprises- SEBRAE, which opened calls for proposals for implementing sustainable forestry management plans in the Serido Region.

61. The dissemination of demonstration plots results motivated other initiatives. In December 2010, the Brazilian Forestry Service -SFB and the Land Reform Institute - INCRA established a partnership to disseminate sustainable forestry management for small farmers from 32 land reform areas, of which 18 based in Pernambuco State and 14 in Paraiba State. This Program is involving 801 families and 5,900 hectares of Caatinga forest. Former project partners APNE and SOS Sertão were hired by INCRA and SFB to provide technical assistance to selected land reform settlements in these States, being a clear opportunity to continue dissemination of project results.

62. Lack of monitoring data did not allow a precise estimation of sustainable management plans implemented in the region. This information should be managed by governmental environment agencies at state level. However, these agencies do not have institutional capacity to collect and monitor information on sustainable management plans timely. By the end of the project, none of the States agencies had proper structure to provide follow-up to management plans. Due to the absence of computerized databases, they could not provide updated information regarding the evolution of land area under sustainable management.

63. According to early information collected by APNE, 189 management plans were being implemented by 2007, occupying an area of 93,863 hectares (Table 4). Data published by SFB in 2010 indicated that the area with management plans increased 136% between 2006 and 2010, enlarging from 125,000 to 295,000 hectares. It is difficult to estimate to what extent the project impact on this process. However, the information available suggested that the efforts on training and dissemination of demonstration plots results contributed to the growing trend of management plans in Caatinga Biome.

Table 4: Number of management plans and area (hectares) in four Brazilian States - year 2007.

Brazilian State	# of Management Plans	Area (hectares)
Ceará	139	69,645
Paraíba	1	61
Pernambuco	26	15,355
Piauí	23	8,775
Total	**189**	**93,836**

Source: APNE, 2007

64. Nevertheless, considering that the remaining forest occupies 340,000 of Caatinga Biome, the area managed with environmental permits is less than 1%. Likewise, lack of monitoring data does not allow an evaluation regarding the quality of the management plans or how close they are from the technical proposal disseminated by the GEF Caatinga project.

65. Consultations carried out during this evaluation indicated that lack of institutional capacity of governmental bodies to approve forestry management plans timely and unavailability of credit to pay the costs of plans design were the main constraints for scaling up the proposal. In Araripe Region the annual costs of technical services is estimated in U$ 2,500. Brazilian banks provide credit for forestry management plan, but the loans do not cover the costs to contract technical services for plan design and monitoring, which is mandatory according to the Brazilian norms.

66. Moreover, the sustainable forestry management approach is not internalized by governmental agencies yet. In many cases, the management plan is still being considered as a disguised way to formalize deforestation. Therefore, technical staff from governmental agencies does not feel confident to issue permits, delaying the approval process. On the other side, farmers fear that the formalization of management plans will result in excessive surveillance, hindering their production plans.

67. Beyond the activities oriented to sustainable forest management of wood species described previously, the project also promoted the restoration of deforested areas and sustainable management of non-wood species.

68. A partnership with the Brazilian Agricultural Research Corporation - EMBRAPA and the University of São Francisco Valley was established to organize training activities for technical staff from governmental agencies on restoration of degraded areas through the implementation of agroforestry systems. The project supported Araripe Foundation to raise additional funds from São Francisco and Parnaíba Valleys Development Company - CODEVASF to implement 11

[2] Source: Serviço Florestal Brasileiro. Florestas do Brasil em resumo – 2010: dados de 2005-2010. Brasília: SBF, 2010. 152p.

demonstration plots in Petrolina region. The same strategy was replicated in the North of Minas Gerais States, Araripe and Xingó region, resulting in 26 projects approved with financial support from the Growth Acceleration Program – PAC. However, due to juridical barriers presented by the Ministry of Environment, the projects were not implemented by the end of the GEF Caatinga Project termination.

69. APNE in partnership with The Caatinga Forestry Management Network developed guidelines for sustainable management of Angico (*Anadenanthera* sp) for tannin extraction. These guidelines have been developed after the implementation of five experimental plots. Their dissemination occurred during training activities and by the National Information Center of Northeast Plants web site.

70. Likewise, the Araripe Foundation developed methods for sustainable management of Pequi, Licuri, Babaçu, Umburana, Janaguba e Fava D'Anta, which are important NWFP species for local communities. These guidelines were disseminated during training activities though they were not published. Because the existence of these guidelines, the Ministry of Environment included these species in the National Program for the Promotion of Sociobiodiversity Products Chain Value. This Program was launched by the Ministry of Environment in 2008 after a large consultation process with civil society, which included the project partners Agendha and Araripe Foundation.

71. At local level, project partners implemented business plans for sustainable management and trading of non-wood species. In Petrolina and Araripe sites, Araripe Foundation developed business plans for the following species: Pequi, Babaçu, Umbu e Maracuja. The project supported the implementation of two processing units in Araripe region, benefiting 320 families of small farmers.

72. In partnership with Agendha, the project supported the establishment of farmers eco-business network called "BODEGA DA CAATINGA". This network joined 35 Farmers Associations, involving directly 5,133 families living in 21municipalities from five States. Bodega da Caatinga promoted both the development of sustainable management techniques as well as market chain value for products from Caatinga forest. Most of the beneficiaries are rural women.

73. During the project implementation, Bodega da Caatinga commercialized farmers products in handicraft exhibitions, markets and events. The network has been participating actively in the most important Brazilian handicraft exhibition, which receives more than 480 thousand visitors. The National Market of Family Agriculture organized by the Ministry of Agrarian Development is another major exhibition attended by the network. At international level, the network participated in the exhibition organized by the Slow Food Movement. Since 2007, the Bodega da Caatinga network joined efforts with other similar initiatives from the Cerrado Biome, organizing the Cerrado-Caatinga Room in several exhibitions.

74. Participation in these events increased market opportunities and demand for Caatinga products. Consequently, the network developed a large set of products, including food, liqueurs, handicraft, natural tinning used to produce accessories such as bags, baskets and household utensils. According to data provided by AGENDHA, Bodega da Caatinga developed a catalogue of 780 products obtained from numerous Caatinga species, including vines, shrubs and trees.

75. Important to mention that the support provided by the project was small considering the achievements. Certainly, the commitment of AGENDHA to raise additional funds and the active involvement of its staff were key factor for the successful implementation of the Bodega da Caatinga network, an initiative that provides important lessons on how to organize chain value of biodiversity products at grass root level.

76. Although the management of non-wood forest products (NWFP) has been an old tradition of rural communities in the semiarid region of Brazil, the project provided visibility to these practices, previously recognized as an asset only in tropical rain forest such as the Amazon and Atlantic Rain

Forest. This has been an important step to overcome other barriers, such as those related to the restrictive regulatory framework and lack of credit to promote eco-business managed by small farmers.

77. Considering the expected outcomes for the Output 1, the project results are rated as satisfactory. The project achieved its goal of demonstrating sustainable forest management techniques as well as eco-business initiatives for non-wood species. Structural constraints at regulatory and policy level were the main barriers to a wide adoption of practices promoted by the project.

3.3.2. *Output 2: Techniques and practices for increasing the efficiency of wood transformation demonstrated and adopted by the charcoal, brick, tile and plaster industries in four Priority Areas with the aim of reducing carbon emissions and increasing the sustainability of the region's energy matrix*

78. Considering that biomass from Caatinga forest is the main energy source in the Brazilian Northeast Region, the project provided support for energy efficiency of firewood used at industry and household level. The strategy to promote the green energy approach included support to technical studies, demonstration and dissemination of eco-friendly technologies for charcoal production and domestic stoves.

79. First of all, the project put effort on gathering and data analysis regarding the importance of wood products in the energy matrix of Northeast Region, especially in important economic chains such as bricks, tiles and plaster industries. The results of these studies were widely disseminated, attracting the interest of private companies to incorporate sustainability criteria in their energy matrix. The project work closely with the governmental agency responsible for regional planning, which included these data in its annual statistic newsletter.

80. At governmental level, the information provided by the project studies attracted the attention of other institutions to the green energy approach. In the State of Pernambuco, the environmental agency IBAMA used project data to enforce the law. In March 2007, IBAMA and the Environmental Agency of Pernambuco - CPRH signed an agreement to implement the *Mata Nativa* Program in the Araripe Region. This initiative included training activities and intensification of field surveillance. After a consultation process with industry owners, the governmental bodies implemented agreements with the private sector to reduce deforestation and illegal use of Caatinga forestry resources.

81. The results of the Mata Nativa Program registered an expressive reduction in deforestation (Table 5). According to IBAMA, by the end of 2008 was the number of industries with environmental permits achieved 85% of 115 industries operating in Araripe Region. There was also a substantial reduction in the use of native forest species for firewood purpose. Estimates suggest that at least 5,000 ha of Caatinga Forest remained preserved because the Mata Nativa Program.

Table 5: Main indicators of Mata Nativa Program implemented by IBAMA with support of GEF Caatinga project

Indicators	Year 2004	Year 2008
Industries with environmental permits	17	98
% of firewood from native forest used by industries	80%	20%
% firewood from planted areas used by industries	15%	65%
% of firewood from managed areas used by industries	5%	15%
Estimates of illegal firewood used by industries (st/year)	1,166,400	243,000

Source: IBAMA, 2008 – Mata Nativa Report

82. In order to bring technological options to the industrial sector, the project supported the Sustainable Industrial Production Center –CEPIS[3] to carry out a study on energy efficiency of industries based in the Araripe Region. The methodology used by CEPIS included an assessment of energy performance of five industries, observations and measurements at plant level, training activities for industry labors and development of action plans to improve energy efficiency. The study results were consolidated in a technical bulletin and disseminated during training activities and technical conferences.

83. The study findings revealed that the oven used by industries were a weak point in the production chain, requiring a great amount of firewood. As a follow-up of this study, the project supported CEPIS to develop an improved oven prototype. However, it was not possible to test this prototype before project termination.

84. A demonstration plot on energy efficiency was implemented by the plaster industry São Geraldo, in Pernambuco State. Another demonstration plot was implemented by the tile industry Gomes de Matos in Araripe Region. The later was visited during this evaluation. According to the industry manager, the economic results are outstanding. The company adopted many recommendations for improvements in the production chain, including the sustainable management practices of Caatinga forest disseminated by the GEF Caatinga project.

85. The improvements in the production chain reduced the consumption of firewood to produce 1,000 bricks from 1 m st to 0.2 m st. The smoke reduction in the plant attracted more women labors, which now correspond to 30% of the workforce. The adoption of management plan for the wood production areas that supplies the industry opened 200 jobs.

86. Thanks to these changes, the company obtained the GeoPark label from UNESCO. Additionally, the technological improvements qualified the industry to apply for carbon credits. In 2010, the industry sold 147 tons to the World Bank and negotiated another 35 tons with J.P.Morgan. Because these achievements, this company has been attracting the attention of several industries in Brazil and abroad, receiving hundreds of visitors annually. As a member of the National Association of Tile Industries, the company included the green energy approach in the Association annual meetings agenda.

[3] The Sustainable Industrial Production Center (CEPIS) is a project of SEBRAE in partnership with the State Secretariat for Economic Affairs of Switzerland (SECO).

87. To ensure follow-up, Araripe Foundation obtained additional support from the Ministry of Science and Technology for disseminating good practices implemented by this company. Therefore, despite limits for widely adoption of proposed technologies, the successful case of Gomes de Matos Industry is an opportunity for continuous dissemination of the green energy approach after project conclusion.

88. During this evaluation was not possible to collect enough evidences about the impact on industries involved in the study. According to secondary sources and project internal reports, industries adopted the proposed improvements partially. Lack of financial resources refrain small industries to fully implement the action plan proposed by CEPIS. Project staff interviewed during this evaluation mentioned that an agreement signed by CEPIS and the Institute of Energy Efficiency of the Ministry of Science and Technology would ensure the continuity of this initiative.

89. Considering that 80% of Brazilian industries working in the brick, gypsum or tile production are small companies and do not have financial resources to afford technological improvements proposed by the project, it is expected that the scale up of the green energy approach will depend on the expansion of financial support from public and private banks at competitive interests rates. In 2011, Brazilian Government announced the creation of the Climate Fund and it is expected that the Brazilian Development Bank –BNDES will provide 150 million to the Fund to support technological investments on energy efficiency.

90. The promotion of green energy approach included also fuel production for commercial purpose and improvement of domestic stoves. In relation to the commercial charcoal production, the project supported the implementation of eight demonstration units in Araripe and Seridó Region. The prototypes of improved ovens showed that it was possible to increase the efficiency of charcoal production. However, the owner of patent rights did not allow the dissemination of the prototype. Additionally, at that time charcoal production was (and still is) a very sensitive issue in Brazil. Therefore, the project coordination decided to abort the activities on charcoal production for industrial purpose.

91. On the other side, the efforts on improvements of domestic stove generated satisfactory results. In partnership with AGENDHA, the project supported the development of a domestic stove that requires 60% less firewood than the conventional model. With additional funds raised from the National Environment Fund, 233 eco-stove were distributed in Bahia State, including rural households, one school at the Pankarare Indigenous Land, two collective kitchens at Tuxá Indigenous Land. Further work of AGENDHA improved the eco-stove prototype, developing a methodology of construction using local raw material. As a follow-up, the project supported AGENDHA to organize workshops in 21 communities, teaching how to build the eco-stove. The workshop contents included issues related to the sustainable management of firewood and the concept of energy security at household and community level.

92. The success of eco-stove developed by AGENDHA spread beyond the project boundaries. UNDP disseminated the proposal to other areas in Brazil, including a project involving indigenous people Guarani. The eco-stove has been also recognized as a model technology by the National Climate Change Fund and the National Environment Fund. According to information obtained during this evaluation, several NGOs have been demanding AGENDHA assistance on the eco-stove technology.

93. Lack of data did not allow estimating the reduction of carbon emission resulted from the project. Structural difficulties faced by small industries limited the scale up of the proposed technology for energy efficiency at industry level. However, considering all factors influencing decision process in the energy sector, both at industrial and domestic level, the results of Output 2 are rated as satisfactory.

3.3.3. ***Output 3:*** *Three ecological corridors with a mosaic of protected areas of different categories and sustainable land-uses, created as a strategy for conservation of biodiversity at the landscape level.*

94. Beyond the issues related to the sustainable use of Caatinga Forest addressed by the Output 1 and 2 described previously, the project design also considered the protection of Caatinga forest. First of all, it provided support for studies on the state of the art of protected areas in the region, giving inputs for decision making at federal and state government level. The partner organization APNE carried out technical studies on Caatinga coverage, giving inputs to identify priority areas for protection.

95. As a result of these efforts, four protected areas were created, of which two received direct support from the GEF Caatinga project (Table 6). The Negreiros National Forest was created in October 2007, occupying 3,000 hectares in Serrita, Pernambuco State. The inputs offered by the project included technical advice and financial support for the preliminary studies and inventories requested to prepare the protected area creation plan. The Brazilian regulation for protected areas classifies National Forest as sustainable use category, which allows the sustainable management of forestry resources. Since Flona Negreiros is situated 100 km far from the gypsum industry region, it is expected that this protected area will contribute to the dissemination of sustainable management practices promoted by the GEF Caatinga Project.

96. The São Francisco Natural Monument (MONA São Francisco) was created in June 2009, occupying 26,736 ha in the border of Sergipe, Alagoas and Bahia State. The project provided financial support to carry out the preliminary studies and, in partnership with AGENDHA, it worked with local communities living in buffer zone to increase awareness on the importance of sustainable management practices. With financial support of the Ministry of Environment, AGENDHA implemented 23 sustainable forest management plans in the buffer zone, with special attention to non-wood species. Considering that Natural Monuments are classified within the integral protection category, the efforts to promote sustainable management in the buffer zone were important to reduce pressure on MONA São Francisco natural resources.

97. Indirectly, the project collaborated to create the Capivara-Confusões Ecological Corridor, covering an area of 1.78 million hectares between two National Parks in Piauí State. After the corridor creation in March 2005, the project signed a MoU with IBAMA to set up operational management tasks. With support of several experts, the project organized five training meetings for small farmers from 20 land reform settlements located in the corridor region. The training contents included issues related to the sustainable management of Caatinga forest as well as sustainable agricultural and cattle production. Lack of a local partner and financial resources to follow up training activities did not allow the consolidation of sustainable management plans as occurred in Xingó region. Therefore, it is not possible to evaluate the impacts of training activities on farmers' practices.

98. The project also supported the creation of the Caatinga Ecological Corridor, which linked eight protected areas situated in five Brazilian States. The project partner AGENDHA coordinated the first workshop for the creation of this ecological corridor. In April 2006, the Ministry of Environment launched the creation of the Caatinga ecological corridor, covering an area of 5 million hectares.

99. The project design included support to enforce forest protection norms in the buffer zone private lands. However, the achievement of this goal was not possible due to lack of institutional capacity of governmental agencies for surveillance and approval of private reserve plans. Additionally, project staff was overloaded and had no capacity to follow up these activities.

Table 6: Protected areas that received support from the GEF Caatinga Project

Protected Area Name	Area (ha)(*)
Directly	
São Francisco Natural Monument	26,736
Negreiros National Forest	3,000
Sub-total	*29,736*
Indirectly	
Caatinga Ecological Corridor	5,000,000
Capivara-Confusões Ecological Corridor	1,788,100
Sub-total	*6,793,100*
TOTAL	**7,092,736**

Source: (*) MMA - Protected Area National Database

100. The activities involving protection of Caatinga Biome included support for capacity building at State level. Therefore, in partnership with the implementing agency Caatinga Friends Institute, the project promoted training activities involving governmental officers, policy makers and civil society representatives from the States covered by the Caatinga Biosphere Reserve. Recognized by UNESCO in 2001, the Caatinga Biosphere Reserve covers an area of 19, 9 million hectares, of which 1 million is the core area.

101. The main goal of these training activities was the consolidation of Biosphere State Committees, thus strengthening the management structure of the Caatinga Biosphere Reserve. During the project formulation it was recognized the important role played by these Committees in the development and implementation of protect areas policies at State level, being the link between the National Committee and State authorities. Joining representatives from governmental, private and civil society, the creation of State Committees is considered an important step to ensure broad participation of stakeholders.

102. Beyond training activities, the project provided financial resources for organizing meetings with governmental officers, implementation of committees in nine States and development of committees working plans. The implementation of State Committees does depend on the approval of governmental officers at State level. Therefore, general elections realized in the end of year 2006 resulted in changes of governmental officers, delaying the negotiation process for committees' creation. According to information provided by the partner Caatinga Friends Institute, seven State Committees were operating by the end of the project, four of which were created with direct support from the GEF Caatinga project.

103. This evaluation did not have the opportunity to analyze the performance of State Committees and their influence on policy making. Nevertheless, in Pernambuco State whether the State Committee is more active, the State government announced in 2011 the creation of 13 protect areas in Caatinga region.

104. At federal level, the project coordination worked closely with the Ministry of Environment to develop the National Policy for Sustainable Use and Conservation of Caatinga Forest. The project sponsored the organization of consultation workshops, involving a broad range of stakeholders. The policy proposal was finalized though the Presidential approval was still pending by the end of this evaluation.

[4] Available in http://www.mma.gov.br/sitio/index.php?ido=conteudo.monta&idEstrutura=119#

105. The expected outcomes for the Output 3 were very ambitious and depended on many external factors. Consequently, the project faced moderate shortcomings to achieve its goals. Instead of three, it contributed to implement two ecological corridors. Sustainable management plans in the buffer zone were implemented only in Xingó Region. Replication of management plans to other priority areas within the ecological corridor would request additional financial resources and extra institutional capacity at State level. Despite the official establishment of six State Committees of the Caatinga Biosphere Reserve, it was not possible to ensure the consolidation of committees in all nine States. Therefore, the outcome results are rated as **moderately satisfactory**.

3.3.4. Output 4: Incentives for Caatinga integrated ecosystem management created and tested at the biome level

106. The actions to provide incentives for the biome included efforts to increase financial resources from existing sources, the search for new sources of funding, the development of mechanisms to reduce tax and to certify Caatinga products.

107. The project partner Esquel Foundation carried out studies on mechanisms to increase the Caatinga Biome sharing in the National Fund for Environment (FNMA), the main public funding agency for environmental projects. The process included consultation with grassroots organizations to identify bottlenecks for accessing available funds as well the priority areas for fund raising. The studies also reviewed the existing lines of credit offered by public and private banks, proposing adjustments to meet Caatinga projects needs. The results of these studies were consolidated in five reports and presented to financial institutions and grassroots organizations in a Seminar to develop the "Caatinga Sustainability Guide".

108. As a result of these efforts, in 2006 the FNMA opened a call for *Caatinga* biome, giving the approval for nine projects. Despite the FNMA did not launch new calls during the project implementation period, in June 2011 the Ministry of Environment and the public bank Caixa Economica Federal signed and agreement transferring US$ 3,5 millions to FNMA for funding projects on energy efficiency and sustainable management of Caatinga forest. The priority areas for this fund include Araripe and Xingó Region, both covered by the GEF Caatinga project.

109. Beyond financial resources operated by the FNMA, the project coordination and partners put efforts to attract new funds for Caatinga Biome (Table 7). Discussions promoted by the GEF Caatinga project with the Ministry of Environment and partner organizations resulted in the proposal for creating the Caatinga Fund, a similar initiative adopted by the Brazilian government for Atlantic and Amazon Rain Forest. Therefore, in June 2010 the Ministry of Environment presented a draft proposal, indicating the public bank Banco do Nordeste as the implementing agency of the Caatinga Fund. According to this proposal, this fund main goal would be the reduction of desertification and mitigation of climate change impacts. However, the process did not progress and the Caatinga Fund was not operating by the end of this evaluation.

110. In relation to governmental budgetary sources, the project coordination worked closely with the Ministry of Environment and CODEVASF to access funds from the Growth Acceleration Program (PAC). As a result, the Brazilian Government approved US$21 millions to support projects in the Caatinga Biome. However, due to operational difficulties within the financial department of the Ministry of Environment, the money transfer was still pending by the end of this evaluation.

111. In 2010, the Ministry of Agrarian Development and the Ministry of Environment provided US$ 2.9 million funding to AGENDHA for expanding the Bodega da Caatinga approach to the northeast of Brazil. This initiative – called NUTRE Project- aims to include NWFP products in

schools meals of all Northeast region States, following the requirements of the new National School Meal legislation approved in 2009. This initiative opened a large market for food products from Caatinga biome, creating more incentives for adoption of sustainable management practices. Based on the successful results obtained by AGENDHA, the Nutre project has been expanded to the Amazon Region.

Table 7: New funding opportunities for the Caatinga Biome

Source	Objective	Starting Year	US$	Status
Ministry of Agrarian Development & Ministry of Environment	Introduction of Caatinga Food products in Schools Meals	2010	2,900,000	being implemented
Ministry of Environment (FNMA) and Caixa Economica Federal	Support to Energy Efficiency and Sustainable forest management in Caatinga Biome	2011	3,500,000	being implemented
Ministry of Environment & Growth Acceleration Program (PAC)	Support to projects for sustainable use and conservation of Caatinga Biome	Pending	21,000,000	Pending
Ministry of Environment and Banco do Nordeste	Caatinga Fund (reduction of desertification and mitigation of climate change impacts)	Pending	Pending	Pending

112. Other smaller funding were provided by governmental and private sources, being used during the project implementation to disseminate successful experiences supported by the GEF Caatinga project. These funds were obtained as a result of the direct action of project coordination as well as through initiatives of project partners.

113. The Ministry of Environment financed US$ 180,000 to support local communities' projects in the Xingó Region. The Ministry of Science and Technology - MCT provided US$176,000 for technological improvements in fruit processing unities implemented by Araripe Foundation. AGENDHA obtained U$ 60,000 from the private bank HSBC to disseminate eco-stoves for domestic use. SEBRAE provided U$160,000 for dissemination of sustainable forestry management in local communities followed by AGENDHA. It also provided US$ 118,000 for the partner organization SOS Sertão to develop sustainable forest management plans for 18 local industries. The project coordination provided support to FITOVIDA for obtaining funds from the Ministry of Environment to carry out studies on sanitary norms. Altogether, these extra funds corresponded to US$ 850,000.

114. Regarding other types of incentives, the project formulation included activities to promote tax reduction mechanisms already adopted in some Brazilian States. However, due to budgetary constraints and reduced team it was not possible to implement the planned activities.

115. The project did not work directly with certification issues using standard certification bodies. However, the 780 products managed by NFWP network *Bodega da Caatinga* obtained official recognition from the Bahia State Government as fair trade products. Internally, the network also developed norms and defined quality standards for receiving the Bodega da Caatinga label. This network became widely recognized, receiving along with AGENDHA the Chico Mendes Prize 2011 as recognition of their contribution to protect Caatinga Forest.

116. In relation to the wood products, the project made contacts with the Forest Stewardship Council - FSC to develop a certification protocol for Caatinga forest. This initiative did not progress before the project termination though the Brazilian Forest Service is considering this issue.

117. Despite some shortcomings, the evaluation concludes that the results of this Output were satisfactory. In cases such as the Caatinga Fund and the resources obtained from the Growth Acceleration Program, institutional weakness at the Ministry of Environment were a barrier to the full implementation of these funds, being out of control of GEF project coordination. Considering the available fund before the project, the expansion of funding for Caatinga biome was expressive though not enough to cover existing demands. Of course the expansion of funding for Caatinga was not a result of the GEF Project alone. However, it certainly contributed giving more visibility to the potential for sustainable use and conservation of Caatinga forest, attracting the interest of policy makers and financial institutions.

118. Nevertheless, the project did not obtain progress on adjustments and improvements in credit lines already available. In the last decade, Brazilian government has expanded the credit lines for small farmers, including support to agroforestry and forest species plantation. However, the credit norms are quite complex, limiting the access of target groups. As mentioned previously, it does not cover all costs involved in the implementation of sustainable management plans. Considering the potential of established credit lines such as the National Program for the Strengthening of Family Agriculture – PRONAF, it would be strategic to include sustainable forest management in the rural credit lines operated by public and private banks.

*3.3.5.**Output 5:** Multi-sectoral capacity developed for integrated ecosystem management*

119. This Output covered activities on regulation and institutional capacity of governmental organizations, both at State and municipality level. Additionally, it included activities to strengthen NGOs and grassroots organizations capacity to adopt and disseminate the sustainable forest management approach.

120. The project influence on the debate around Caatinga Biome policies was satisfactory, both at State and Federal level. As a result, major governmental programs have included sustainable management and the green energy approach in their agenda, such as the National Plan to Combat Desertification and the Plan for Combating Caatinga Biome Deforestation.

121. At regulatory level, the project participated actively in the development of regulatory framework for sustainable management plans of Caatinga forest. Beyond participating in the Caatinga Working Group, the project coordination facilitated consultation with stakeholders and specialists. As a direct result of these efforts, in June 2009 the Ministry of Environment published the Norm Instruction # 1, defining rules for the sustainable management of Caatinga Forest. Despite the norm text did not cover all proposals presented by the project coordination and its partners', the approval of this regulation was an important step to move forward with the green energy approach.

122. At State level, the project provided financial resources for technical studies, training activities for governmental officers as well as technical advice to governmental agencies. Before the beginning of the Project, only three states had operational protocols to work with the Caatinga forest. As a direct result of project activities, another five states developed Forestry Programs, including both the sustainable forestry management and the green energy approach.

123. These concepts were also adopted by development plans implemented at regional level, increasing from one to eleven plans sharing the integrated ecosystem management approach (Table

8). The project contribution included inputs during the consultation process, financial support for sustainable management activities and technical advice for plan designing.

124. According to some informants consulted during this evaluation, the studies and baseline data provided by GEF Caatinga project catalyzed many processes. Thanks to this data, the project could influence the regional energy plan coordinated by the Northeast Development Agency (SUDENE), which recognized the Caatinga forestry biomass as an important energy matrix component. All data collected by the project in Ceara, Rio Grande do Norte, Paraiba, Pernambuco and Sergipe State were transferred to SUDENE database.

125. In terms of expansion of institutional capacity of NGOs and grassroots organizations, the project strategy to work in partnership with NGOs contributed for this achievement. Partner organizations interviewed during this evaluation stressed the importance of GEF Caatinga project to strengthen their capacity to work with sustainable management of Caatinga Forest. Indirectly, other grassroots organizations involved in the partners networks was also benefited, adopting good practices developed by the GEF Caatinga project.

126. According to project staff and partners organizations, at least 32 civil society organizations adopted these practices. However, although this number was superior to the expected outcome, dissemination of good practices was more intense within the partners' organizations networks. During the implementation period, the project did not manage to involve larger Brazilians networks such as the Brazilian Semiarid Coalition (ASA) or National Agroecology Coalition (ANA). These networks join hundreds of grassroots organizations working in the semiarid region and certainly they would get great benefits from the good practices developed by the GEF Caatinga Project.

127. Despite some shortcomings, the project outcomes for this output are rated as satisfactory. The project efforts resulted in expressive improvements at policy level, both at federal and state level. However, unavailability of monitoring data prevents any impact analysis regarding the amount of wood obtained from sustainable management areas as a result of investments in capacity building of governmental agencies.

*3.3.6.**Output 6:** Knowledge base developed to enhance the adoption of integrated ecosystem management of the Caatinga at the Biome level and to determine the national and global benefits that could be derived from this.*

128. Through the support for studies and data gathering, the project provided an outstanding contribution to the generation and compilation of relevant scientific information about the *Caatinga* biome. The project sponsored data collection in the world oldest forestry plots in semiarid regions monitored by the Forestry Management Network. According to the Brazilian Forest Service officers, the project support was decisive to continue monitoring these plots.

129. The partner organization APNE developed a study on the land use in the Caatinga biome. This study was developed in partnership with other donors, resulting in a land use map of the Caatinga biome. This information was included in the Northeast Center for Plant Information - CNIP database developed by APNE. The database structure covered a broad content, including data about protected areas and botany information of caatinga species.

130. This database has been available in the Internet and accessed intensively by a wide audience, including researchers from other institutions. However, by the end of the project there was no clarity regarding the continuity of this database. The Executive Agency (SBF/MMA) did not present a proposal regarding the ownership of this database and its maintenance after project ending. The project coordination started a negotiation with the National Institute of Semiarid (INSA), but decision on this matter was still pending after project termination.

131. Although the project did not implement a structured campaign to promote the *Caatinga* Biome, it certainly raised it status through intensive dissemination activities. During the project implementation the coordination team and project partners participated actively in exhibitions and events, both at national and international level. Exhibitions such as the Family Agriculture National Exhibition provided national visibility to the Caatinga Biome, attracting the attention from policy makers and press.

132. According to project reports, the GEF Caatinga project achieved more than 200 quotations in digital and printed press. Project outcomes were broadcasted by TV shows at least in seven different occasions, three of which at national level. The Bodega da Caatinga produced 40 radio spots, which were disseminated at regional level.

133. The project regional coordinator expended considerable time participating in meetings and conferences, promoting the sustainable forestry management approach and the project outcomes. He also provided *ad hoc* advice to the governmental bodies in the region. After participating in one of these meetings, the environmental agency of Sergipe State decided to implement a forestry management plan at state level, requesting advice from the project coordination team. These *ad hoc* demands were time consuming and involved great efforts from the coordination team. This spontaneous demand was not considered in the project design and quite invisible in the M&E system though it was very important for outcomes dissemination.

134. In terms of printed material, the project supported publishing of 10 institutional folders, four technical booklets, 12 technical bulletins, two magazines and two books. One of these books, called "*Uso sustentável e conservação dos recursos florestais da Caatinga*" (Sustainable Use and Conservation of Caatinga Forest Resources) was organized by the Brazilian Forest Service using mainly studies results produced by the GEF Caatinga Project. The book was also published in the internet, being the first publication available in Portuguese covering this topic.

135. Though the project produced many technical bulletins, they were issued in limited number. The experiences on non-wood products were not documented for wide dissemination. Despite the project coordination and project partners participated in several scientific meetings, project results were not published in peer review journals. According to project coordination, limited budget and time restrictions prevent more investment on publishing project results. However, despite these minor shortcomings, the Output 6 is rated as satisfactory.

3.4. Project Sustainability

136. The sustainability and persistence of project outcomes depend on several factors, many of which are not related to the project performance. The replication of sustainable forestry management and the green energy approach requires a set of conditions at regulatory and policy level as well as enhancement of institutional capacity of governmental bodies. The scaling up of sustainable forestry management depends on changes in credit rules, including availability of funding for technical services. By now, farmers cannot get funds to pay forestry engineers services. This creates serious bottleneck for sustainable forestry management since a technical plan is a requirement to get the permission for exploiting the *Caatinga* forest.

137. In recent years, Brazilian legislation has changed and some federal services have been transferred to States level. However, most of States does not have the institutional capacity required to work properly, especially the issue of permits and analysis of forestry management plans. Farmers and private sector complain that the process to get a permit is very complicated and time consuming, thus discouraging farmers to adopt sustainable forestry management.

138. The project contributed to raise awareness about the Caatinga Biome and to open opportunities to increase the amount of funding for projects in the region. However, the

governmental funds available for Caatinga Biome are still very low compared with other Brazilian biomes. The implementation and strengthening of the Caatinga Fund and other funding sources are vital for continuity and consolidation of project outcomes. By the end of year 2010, the *Bodega da Caatinga*, one of the most successful achievements of GEF project, had not enough funding to cover the costs of networking activities. Starting in 2008, this initiative had not enough time to mature. It is a question whether the partner NGO - AGENDHA - will be able to sustain its role as network facilitator and to continue funding the network activities.

139. However, after the project ending several opportunities have been opened. At federal level, the implementation of the National Plan for Combating desertification and the approval of the Decree to protect and conserve Caatinga Biome created new opportunities to increase Caatinga Biome sharing in governmental funding.

140. The investments on training and dissemination certainly increased the national capacity and skills on forestry management at the Caatinga Biome. Thanks to the project, several Universities started to develop research projects on this subject, including it in the curricula. Forestry engineers involved in the training activities carried out by the project had the opportunity to improve their technical skills to work on sustainable management plans and green energy planning. However, more efforts on training are necessary to increase the number of professionals skilled to meet the potential demand.

141. The strategy to work with a broad and diverse range of partners facilitated a greater ownership by stakeholders. It is expected that partner organizations will internalize the project outcomes and will work to scale up, at least in their working areas. The maintenance of project coordination staff in leading position at the Ministry of Environment created new opportunities for institutional use of project outcomes.

142. Considering all these factors, the project sustainability is rated as satisfactory. Depends on policy development in Brazil on climate issues, both green energy and sustainable forest management approach may attract substantial funding in the coming years.

4. CONCLUSIONS AND RECOMMENDATIONS

143. First of all, it is important to highlight that the project was formulated considering two phases for implementation. At that time, the importance of Caatinga Biome had not great visibility. According to people involved in the project formulation, these facts explain the reasons for proposing very ambitious objectives. However, the second phase was aborted, reducing the time schedule for project implementation. The budget cuts and losses due to US dollar devaluation forced reduction in planned activities and implementation sites. Therefore, the final analysis of project achievements had to take into account all these constraints.

144. Answering to the first evaluation question, the findings suggest that the project contributed satisfactorily to develop a biome-level framework for the integrated ecosystem management of the Caatinga Tropical Dry Forest. Ten years ago, the potential of sustainable management of wood and non-wood Caatinga species was almost invisible for policy makers and governmental agencies. The dissemination of demonstration plots results and the support for data gathering on firewood consumption were important contributions made by the project to promote the sustainable management and the green energy approach.

145. The decision to implement the project in a decentralized way involving multi-sectoral organizations were crucial to overcome budgetary and personnel limitations. This strategy also created the conditions for dissemination of good practices, reducing the risks of lack of ownership after the project termination.

146. Important to consider that this was the first project in the Caatinga Biome based in a holistic approach and with multi-stakeholder collaboration, involving local communities, NGOs, private sector, research institutes, universities and governmental agencies at Federal and State level. This broad spectrum of action and partnership and the achievements at policy level created good conditions for positives impacts in the future.

147. In relation to the second question, the technical solutions promoted by the project contributed satisfactorily to strengthen the poverty alleviations programs implemented by the Brazilian government. The semiarid region presents the lowest social indicators in Brazil, being the target area for social programs implemented by the Brazilian Government in the last ten years. The Bodega da Caatinga Network demonstrated the potential of Caatinga forest for income generation, especially for the poorest families. Technical solutions developed and promoted by the project also demonstrated that instead of being a "marginalized area", the Brazilian semiarid is an important asset, both at national and global level.

148. The achievement of sustainable Caatinga forest management depends on several factors, including regulatory framework, funding and institutional capacity of governmental agencies at Federal and State level. Shift in paradigm is a long term issue. It requires continuous efforts to increase awareness in all sectors. Therefore, the short term of this project did not allow assessing potential impacts in the long term.

149. Lack of data prevents to provide enough quantitative evidences of global benefits. Nevertheless, the information obtained during this evaluation suggests that the project did contribute for the global environment. According to CEPIS data, the technological improvements tested by gypsum industries resulted in 11% - 56% reduction of firewood consumption. The eco-stove technology developed by AGENDHA reduced the demand for firewood in about 60%. Thus, it is reasonable to expect that the dissemination of these technologies will reduce deforestation and greenhouse gas emissions, with positive impacts on the global climate.

150. The project contributed to enforce the protection of 7 millions hectares, with direct impacts on biodiversity conservation of world dry forests. The reduction of deforestation promoted by Mata Nativa Program (as described in the output 3) certainly contributed to reduce biodiversity losses. The sustainable management approach demonstrated and disseminated in Araripe and Xingo sites lead to positive changes in land use, contributing for conservation of biodiversity and traditional knowledge.

151. Therefore, the project was **highly relevant** in meeting the objectives of international treaties like the UN Convention on Biological Diversity, the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification. The project responded to the development objectives of Brazil, meeting the needs of the target beneficiaries. Its design was satisfactory and the project document offered a convincing approach to address the existing problems, though the timing and objectives were too ambitious in relation to the budget and time available.

152. The dissemination of the sustainable *Caatinga* forest management and the green energy approach has been the major contribution of this project. Despite shortcomings faced during implementation, the project was **satisfactorily effective** in achieving its expected outcomes. The strategy to establish a broad partnership with different actors was very important to overcome budget and personnel constraints. The management adaptability and flexibility were key elements in the implementation.

153. The sustainability and persistence of project outcomes depend on several factors. It could be improved whether the government internalizes the project approach and outcomes. Otherwise, replication and scaling up will be restricted to the capacity of project partners. Considering the

opportunities for funding opened after project ending and the recent progress in the governmental agenda, the sustainability is rated as **satisfactory**.

154. Based on the evaluation findings, the following **recommendations** are presented:

155. Ensure ownership and maintenance of project data by the Ministry of Environment. The project produced an expressive body of knowledge, including numerous reports, technical bulletins and other pieces of information that cannot be lost. The database developed by the partner organization APNE deserves special attention, requiring continuous updating.

156. Provision of extra funding for follow-up of documentation activities. Excepting the book organized by the Brazilian Forestry Service, there is no publication that summarizes project outcomes and lessons learned. Support for documentation could include publications presenting project results for a broader audience as well as manuals covering methodological and technical issues, such as, eco-stove construction, design of sustainable forestry management plans, guide for assessment of energy efficiency in gypsum/brick/tile industries, guide for energy sufficiency in rural households, etc. Partner organizations and specialists that contributed with the GEF Caatinga project should be actively involved in this process.

157. Provision of extra funding for follow-up of training activities. A plan for training activities on sustainable forestry management and energy efficiency could involve governmental agencies both at Federal and State level, strengthening technical capacities of governmental officers in this area. The plan should include training activities for professionals from the non-governmental and private sector as well.

158. Continuous efforts to include the sustainable forest management as part of credit lines already available such as PRONAF and Rural Credit. This is an essential step to scale-up sustainable wood managed areas and to create more incentives for sustainable management of NWFP.

159. Continuous efforts to expand credit lines for investments in energy efficient, considering special lines oriented to small scale industries. The GEF Caatinga project results should be disseminated to governmental bodies and financial institutions interested in the climate agenda.

160. Continuous efforts to build up institutional capacity of governmental agencies at State level on forestry management issues, including project analysis and issue of permits for forestry management plans, as well as surveillance and monitoring services.

161. Continuous efforts to include the sustainable forestry management in the research agenda, especially the NWFP. The experience of project partners and local communities should be considered in defining research priorities.

162. Consider the local communities when planning the creation of protected areas in the Caatinga Biome. Despite the Brazilian legislation recognizes categories that associates protection and sustainable use, the mainstream vision still favors the more restrictive categories. The semiarid region of Brazil is densely populated and ignoring the presence of inhabitants in the remaining forest areas does not secure Caatinga forest protection.

5. LESSONS LEARNED

163. The time gap between formulation and implementation affects project results. Very often this delay requires adjustments that are time-consuming, with implications on the implementation strategy and institutional arrangements built during the formulation phase. The need to avoid further delay prevents that these new arrangements are suitably negotiated, adding risks for the project effectiveness and sustainability.

164. The design of projects involving innovative concepts and practices that scaling-up depends on changes in the regulatory framework and new institutional capacities should better take into account the timeframe and budget. Usually, this type of project requires a longer timeframe to achieve sustainable results. Timeline and tight budgets compromise the sustainability and long term impacts.

165. The less mainstreamed the project is within the executing agency, the more difficult to implement it. Lack of political support let project managers in an isolated position, constraining institutional ownership of project results. Therefore, during project negotiation it is important to ensure political commitment of executing agency head officers.

166. Project logframe and M&E matrix should be developed at early stages and in a participatory way, ensuring ownership of project managers and partner organizations. Lack of a useful and feasible monitoring system prevents proper output track record, creating serious difficulties to present evidences of project achievements.

167. A decentralized strategy and multi-stakeholder involvement in project implementation through sub-projects increase the sustainability and reduce the risks associated with shortcomings at executing agency level. Partners that share project vision and have dense social networks among potential beneficiaries are the most effective for implementing sub-projects. This type of organization can be very efficient on dissemination and replication of project outcomes.

168. Decentralized and multi-sites projects require a well designed communication system, which has to be part of the project logic. This is a condition for ensuring timely exchanges between project partners and project coordination, as well as among project partners. The absence of such mechanisms reduces bilateral sharing between partners that hold different skills and have no previous experience of working together, thus preventing partners´ ownership of the overall results.

169. The network approach is a strategic element for project implementation. The network action enables sharing and expansion of existing capacities, increasing project efficiency and efficacy. The Bodega da Caatinga experience demonstrates how the network action expands the market opportunities for small farmers, with direct impacts on income generation and improvement of livelihoods.

170. Minor technological improvements in gypsum/brick/tile industries can increase energy efficiency. However, adoption of these technologies by small scale industries depends on access to credit and technical assistance. Therefore, any initiative oriented to energy efficiency should consider not only the technological side, but regulatory and financial needs as well.

171. Sustainable management of Caatinga forestry resources can be technically and economically feasible, both for wood and non-wood species. However, scale up depends on adjustments on regulatory framework, dissemination of technical capacity, access to credit and market. All these issues need to be considered to ensure dissemination and wider adoption of sustainable management practices by small farmers, farmers and industries that rely on firewood and other forestry resources.

172. Non-wood forest products from Caatinga forest have great potential for income generation, especially after investments on processing units that add value to these products. However, projects should consider the whole production chain, including market. Lack of market strategy limits the economic return of investments made in processing unities. Additionally, it is necessary to support capacity building of local communities' organizations to ensure local ownership and long term sustainability of these initiatives.

173. Local communities can be important allies of Caatinga forest protection. Protection plans are more effective whether they ensure early stakeholders involvement in protected areas design providing support for sustainable management of buffer zones. Involving local communities brings more guarantees for the long term sustainability of protected areas.

Annex 1: List of people consulted by the external evaluator

NAME	ORGANIZATION	POSITION
Francisco Campelo Barreto	SFB/Ministry of Environment	Regional Coordinator of the GEF Caatinga Project
João Arthur Seyffarth	SFB/Ministry of Environment	Overall Coordinator of the GEF Caatinga Project
Carlos Castro	UNDP Country Office	Head of Environment Unit
Helen Coles de Negret	GEF	GEF Regional Coordinator for Brazil
Edvalda Aroucha	AGENDHA	Director
Maurício Aroucha	AGENDHA	Technical Coordinator
João Arnaldo	IBAMA	Technical officer at Northeast Unit
Stephenson Ramalho de Lacerda	Fundação Araripe	Technical officer
Frans Pareyn	APNE	Overall Coordinator
Newton Duque Barcellos	SFB/MMA	Head of the Northeast Unit
Maria Auxiliadora Gariglio	SFB/MMA	Technical Officer at the Northeast Unit
Alexandrina Sobreira de Moura	Caatinga Biosphere Committee	President
Pierre Gervaiseau	Fundação Araripe	President
Maria do Rosário Pinheiro	Fundação Araripe	Manager
Ana Tres Cruz	GEF Caatinga Project	Consultant
Magno Antonio Feitosa	GEF Caatinga Project	Consultant
Ricardo Campelo	GEF Caatinga Project	Expert on forest management
Valdineide Barbosa de Santana	Environmental Agency of Sergipe State (SEMARH)	Coordinator of the Biodiversity and Protected Areas Department
Beatriz Alemonge de Souza	Environmental Agency of Sergipe State (SEMARH)	Technical Officer
Ronaldo Gomes de Matos	Gomes de Matos Industry	Industry owner
Manoel José da Silva	Gomes de Matos Industry	Forest Engineer
Maria Regilda Carvalho	Sitio da Macauba Association	Association Board member
Francisca Viana Coelho	Sitio da Macauba Association	Association Board member
Francisca de Sales Vieira	Sitio da Macauba Association	Association Board member
José Valdo	S.Brigida Handicraft Association	Association President