United Nations Environment Programme

Terminal Evaluation of the UNEP/GEF project on "Greening the Tea Industry in East Africa"

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List of Acronyms

AfDB	African Development Bank
AFREPREN	Africa Energy Policy Research Network
BSP	Bali Strategic Plan
CRDB	Cooperative Rural Development Bank
CO_2	Carbon Dioxide
EATTA	East African Tea Trade Association
EC	Evaluation Cost
EC	European Commission
EO	Evaluation Office
ERC	Energy Regulatory Commission of Kenya
FE	Final Evaluation
FSP	Full Size Project
FS	Full Size
GEF	Global Environment Facility
GHG	Green House Gas
GTIEA	Greening the Tea Industry in East Africa
IPP	Independent Power Producer
IGTF	Igara Growers Tea Factory
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KCB	Kenya Commercial Bank
Kg	Kilo gram
KTDA	Kenya Tea Development Agency
Kw	Kilo Watt
kWh	Kilowatt-hour
L	Likely
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
MTE	Mid-Term Evaluation
MTS	Medium Term Strategy
MS	Moderately Satisfactory
MU	Moderately Unsatisfactory
MUSD	Million United States Dollar
MW	Mega Watt
NSCs	National Steering Committees
Nat'l Gov't	National Government
PACEAA	Poverty alleviation through clean energy from agro-industries in Africa
PD	Project Document
PIR	Progress Implementation Review
PMO	Project Management Office
PMU	Project Management Unit
PPA	Power Purchase Agreement
RE	Renewable Energy
REEEP	Renewable Energy and Energy Efficiency Partnership
ReFiT	Renewable Energy Tariffs
RMT	Rwanda Mountain Tea
ROtI	Review of Outcomes to Impacts
S	Satisfactory
SC	Steering Committee
SHP	Small Hydro Plants
SH	Small Hydro
SP	Strategic Priorities
SPPA	Standard Power Purchase Agreement
TE	Terminal Evaluation

TM	Task Manager
ToR	Terms of Reference
UNEP	United Nations Environment Programme
UNEP/DTIE	UNEP-Division of Technology, Economics
US$	United States Dollar

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Table 1. Project Identification

GEF project ID:	2683	**IMIS number:**	GFL-2328-2721-4981
Focal Area(s):	Climate Change	**GEF OP #:**	OP 5 & OP 6
GEF Strategic Priority/Objective:	SP 2, SP 3, SP 4	**GEF approval date:**	18 June 2007
UNEP approval date:	31 July 2007	**First Disbursement:**	14 August 2007
Actual start date:	September 2007	**Planned duration:**	63 months
Intended completion date:	October 2011	**Actual or Expected completion date:**	31 October 2012
Project Type:	FSP	**GEF Allocation:**	US$ 2,854,000
PDF GEF cost:	US$ 569,400	**PDF co-financing*:**	US$ 13,000
Expected MSP/FSP Co-financing:	US$ 25,878,766	**Total Cost:**	US$ 29,491,166
Mid-term review/eval. (planned date):	1-31 Jan 2009	**Terminal Evaluation (actual date):**	24 June – 16 September 2013
Mid-term review/eval. (actual date):	1-31 Aug 2009	**No. of revisions:**	3
Date of last Steering Committee meeting:	17 July 2012	**Date of last Revision:**	03 March 2012
Disbursement as of 31 December :	US$ 2,755,516	**Date of financial closure:**	December 2012
Date of Completion:	October 2012	**Actual expenditures reported as of 31 December:**	US$ 2,755,516
Total co-financing realized as of 31 December:	US$ 16,593,173	**Actual expenditures entered in IMIS as of 31 December:**	US$ 2,755,516
Leveraged financing:	Not reported		

Executive Summary

1. The Greening the Tea Industry in East Africa (GTIEA) project was launched in September 2007 for an initial period of four years, and later was extended twice for a total duration of 63 months, ending 31 October 2012. The initial Project Document contained a detailed study of the tea industry in Africa and other countries, including a survey to establish the availability of hydro resources in areas near to tea factories, specifying energy requirements in tea factories and including historic data about amounts of electricity required, quality of electricity supply, use of emergency diesel gensets, etc. This was a very reasonable and well-constructed approach, since it was necessary to embark tea companies in a completely new type of business.

2. The project background is solid and well described. The same can be said of the project design, including the description of the barriers to be overcome and how the project should remove these barriers. The project objectives and outcomes (some of the outcomes a bit ambiguous and/or unrealistic) were in general reasonably defined, as well as the target groups and stakeholders; however, one issue to be raised is that the initial project time span was too short; four years is clearly insufficient to develop a Small Hydro Plants (SHP) project from the pre-feasibility study to final commissioning, as experience repeatedly has shown in projects of the same nature. A more realistic approach would have been to consider 6 - 7 years.

3. A logical consequence of the above is that the initial objective of having six SHP commissioned at the time of project termination has not been reached; only one plant (Tagabi-Kericho, an enlargement of an already existing SHP) has been commissioned, whereas other two small hydro plants are under construction (Gura Hydro Power Project in Kenya and Giciye SHP in Rwanda).

4. Three other SHP had achieved feasibilities and bankable proposals were developed: Suma hydro power project in Tanzania (the owner, Wakulima Tea Company, has always strongly supported the project, but feed-in tariffs in Tanzania are low) and North Mathioya and Kipchoria in Kenya, and one (Nchwera, in Uganda) has not been initiated. Construction is in progress in two sites, and for another three adequate financing has been obtained and the plant owners and relevant stakeholders (including energy authorities) are interested in their termination.

5. The installed capacity is considerably larger than initially contemplated in the Project Document (PD), which indicated an initial size of about 500 kW each (this was the assumption adopted about the necessities of electrical energy for a standard tea factory, but was taken without sufficient consideration either of electrification of neighbouring areas or of the very nature of the plant sites (a too small hydro plant puts a burden on future optimal development of a certain river); not surprisingly, it was found later that the real size could be much larger, which resulted in increases of the expected budgets and delays in the estimated construction programme. Nevertheless it must be said that the project management reacted adequately by

taking the necessary decisions to modify the project to adapt it to the real circumstances, in spite of the limited available funds.

6. The modified Project Document indicated a minimum total final capacity of 10 MW, which is to be widely surpassed; Gura alone is 5 MW, North Mathioya 3.3 MW and Giciye 4.5 MW. A relevant cause for these enlargements has been the interest of the owners (tea factories) to increase their profits (this fact reveals a high degree of confidence in the outputs of the feasibility studies), apart from larger environmental benefits, improvements in reliability of supplies, etc.

7. A first consequence of this is that in general the amount of electrical energy generated will be more than sufficient to cover the demand of the corresponding tea factories, and consequently a larger share will be devoted either to rural electrification of neighbouring areas or to export to the respective national grid. The favourable environmental impacts of the project will consequently be increased, since, apart from the reduction of use of diesel gensets in the tea factories, a larger amount of electricity from a renewable energy source will be supplied to other users. Nonetheless it is worth mentioning that in many cases the selected option has been to sell the surplus electricity to the local electric utility, which does not necessarily imply any improvement in the degree of rural electrification of the neighbouring communities, although the supply of energy to networks with an acute scarcity of generating capacity must be considered a positive effect.

8. Another positive effect of the project has been that, since selling prices of electricity surpluses have been discussed with regulatory agencies, these agencies have become more familiar with the fact that the price of a commodity such as electrical energy should be fixed taking into consideration market forces. In fact, GTIEA has played a catalytic role among the energy regulatory agencies of the project member countries in the field of policies related to wheeling tariffs for independent power producers, feed-in tariffs mechanisms and schemes to encourage use of renewable energy sources for electricity generation, etc. Many of these policies have been created or modified along the course of the project and, although it cannot be said that the existence of the project has been the only cause.

9. The fact that at the project termination only one plant has been commissioned and another two are under construction (out of a minimum of six, as established in the Project Document) can look at first sight as a bad result, but it has to be considered that the project design failed to take into account that a SHP can take about 6-7 years from pre-feasibility study to commissioning. Beside this there was an initial lack of experience in the field of SHP in most of the relevant project stakeholders, and nevertheless the total installed capacity will be much larger than initially expected. Taking all this into consideration, the project has been quite successful.

10. A requisite of the utmost importance for the long term successful impact of the project is an adequate operation and maintenance of the plants. Several owners have hired technical personnel for this purpose.

11. From the socio-political viewpoint it seems obvious that the degree of consciousness of stakeholders about the advantages (lesser costs, reduced negative environmental impact, and better reliability) has increased as a result of the efforts carried out by the project teams to create awareness, commitment and incentives among stakeholders, with the only exception of Igara Growers Tea Factory (IGTF), in Uganda.

12. All the consulted officials of the energy regulatory authorities have shown a high degree of consciousness about the SHP potential in their respective countries, although there is an extended lack of data relative to concrete potential, river flows and hydro - geological issues. The environmental benefits of the project were adequately calculated and, apart from electricity outputs larger than envisaged, there are no environmental factors which can influence the future flows of project benefits, either positive or negative. From the viewpoint of owners of the plants, the situation varies from Uganda, where IGTF has shown little interest in Nchwera SHP, (construction of the plant has not started and is at present not contemplated), to Rwanda, where construction of Giciye SHP has not still been completed but nevertheless RMT has already carried out a pre-feasibility study of a future Giciye II. In Kenya the attitude of both individual GTIEA SHP owners and the East African Tea Trade Association (EATTA) is clearly favourable to the construction of more plants, (at the time of project start-up it was difficult to move the tea companies from their initial business to a completely new one as it is the generation and supply of electricity, but eventually the response was generally positive). In Tanzania, the low level of the present feed-in tariffs for this type of plants is an inconvenience for the profitability of this business, but the advantages of self-production from SHP are widely recognized. As for Kenya, the analysis of Gura and Kipchoria SHP carried out by GTIEA (Seminar on Wheeling Tariffs organized by GTIEA and a completed a study on wheeling tariffs in collaboration with KPLC) was a good initiative, since experience has shown that interest from tea companies for selling of surpluses of electricity is continuously growing and wheeling tariffs is one of the main issues to be considered by any Independent Power Producer (IPP) to decide whether to enter the electricity supply business. It is worth to mention that these effects are not only related to SHP, but also to other types of plants.

13. Besides the above, Kenya Tea Development Agency (KTDA, existing since 1964) has created in 2010 a new branch (KTDA Power Company Ltd.), devoted to electrification of the tea industry in Kenya, which is a creation of the GTIEA project and is playing a relevant role in the field of further electrification.

14. Given that the private sector is in principle reluctant to invest in fields in which it has no experience or this is very scarce, the very fact that GTIEA has succeeded in starting so many SHP projects has undoubtedly played a very positive role in the development of behavioural changes of many important stakeholders. But it is essential that these project are adequately finalized and that the results are adequately disseminated if this tendency is to become consolidated.

15. The initiatives adopted by the project to encourage replications were well designed and, given the limitations derived from the short term, can be considered as successful, including Uganda, where in spite of the IGTF scepticism, a clear interest on this type of projects has been shown by the Private Sector Foundation and the Energy Resources Department. Especially

important and successful have been the efforts the project has devoted to get financing means for SHP; given the very nature of these plants, which require large investments whereas running costs are very low, to create interest among investors and donors was a task of the utmost importance.

16. In general there is a very limited amount of information about potential for SHP, annual variations of river flows in suitable places, nature of the terrain, etc. The situation is less bad in Kenya, and this is probably the reason for which prospects for SHP are better (during evaluation visits only very general information about potential was supplied). Nevertheless, and with the exceptions mentioned above, it can be said that the project activities have successfully improved the interest from authorities and relevant stakeholders in projects of this type in Kenya, Uganda, Rwanda and Tanzania. It is worth to take into consideration that all the considered countries are in dire necessity of more capacity for generation of electricity, not only due to the low degree of access to electricity (especially in rural areas) but also for the frequent shortages in the already existing networks, due to the continuous increases in demand, lack of availability of existing generating units, inadequate maintenance of assets, etc.

17. The election of EATTA as the executing agency was very reasonable, given its contacts and good position to encourage initiatives of this type among tea producers in East Africa. According to all the stakeholders consulted, the project ran smoothly from its beginning.

18. The project committees and units have carried out their duties in a quite satisfactory way. With the only exception of some discrepancies between the role to be played by AfDB between this entity and the PMU (the Project Director indicated that AfDB should have been more enthusiastic at the time of encouraging other financing institutions to support GTIEA projects, whereas AfDB argued that these projects do not qualify for direct financing from AfDB), no relevant difficulties and lack of understanding among UNEP, AfDB, EATTA and plant owners (tea factories) have been detected; contacts and discussions seem to have been fluid and constructive.

19. Dissemination of both project objectives and general information about the advantages derived from self-production of electricity from SHP was in general carried out adequately. The main weakness of the adopted approach was the lack of knowledge of SHP characteristics and technology among stakeholders, mainly owners (tea factories), but on the other side the realization of a careful study of the tea industry, its necessities of electricity and the disadvantages derived from an unreliable supply from public networks was an important strength and clearly had very positive effects.

20. The attitude and control mechanisms implemented were reasonably designed and have given a clear idea about the progressive development of the project; imperfections of the project design were quickly detected and causes of delay recognized. Reactions in each case were adequate, and the main difficulties adequately faced. Especially important have been the efforts made to convince financing entities to supply the necessary funding for the project activities.

21. Indicators for evaluation of project execution performance are clearly defined, as well as project outputs, outcomes and milestones; indicators and milestones are clearly defined and easily quantifiable. The same can be said about both key performance indicators and the respective methods of data collection for all the project outputs and outcomes; it seems obvious that careful consideration has been given to the necessity of carrying out a detailed monitoring of the project development.

22. The assumptions made are realistic, as well as the assessment of the possible risks; the only exception is that the possibility of socio-political turmoil has not been mentioned.

23. Initial project budget has been prepared in a reasonable way. Only a more detailed description of monitoring and evaluation costs is missed. In fact, just a lump sum is indicated for Mid-Term and Final evaluation purposes, insufficient since it does not allow for visits to all the project sites. Moreover, the Final Evaluation has faced difficulties derived from the fact that, being the project already terminated, many of the key persons involved were engaged in other tasks and were difficult to contact. It is recommended to foresee this circumstance in any future project.

24. Analysis of the Project Implementation Reviews (PIRs) and other monitoring documents indicated that the monitoring plan was carried out according to the previously determined schedule throughout the entire period of project implementation. The same can be said of annual progress reports, whose analysis (and that of correspondence among project responsible bodies) indicate that the project deviations were duly considered by the responsible project participating entity in a timely manner.

25. As a summary, although only one SHP has been commissioned before the project termination and another two are under construction (three out of an envisaged minimum of six), it can be said that the project has been successful in awakening interest in an industrial sector (tea industry) in a new type of activity and that the greening effects on the tea industry are to be much larger than expected, although this effect will be reached long after the project termination.

I. Evaluation Background

A. Context

26. The Greening the Tea Industry in East Africa (GTIEA) is a multi-country project which has been developed in Eastern African countries sharing, among others, certain characteristics: an important potential for use of hydro resources for generation of electricity, a low degree of electrification (especially in rural areas) and a relevant interest in the tea industry.

27. As described in the GTIEA Project Document, many Eastern and Southern African countries (Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe) are processing tea leaves both for export and domestic consumption. Tea exports are very important for foreign exchange earnings for these countries. Tea accounts for 20% of total national exports in Kenya and Burundi, 12% in Rwanda and 7% in Malawi. Kenya is the largest exporter of tea in the world as well as the third largest producer. It is dominant in Africa, accounting for around 70% of tea production on the continent. Being labour intensive, the tea sector is a major source of employment in Eastern and Southern Africa, employing around 1 million and providing the major source of livelihood to some 4 million people.

28. Tea processing is an energy intensive activity, using as much energy per kg of made tea as steel processing. Depending on process and equipment efficiencies and types and local cost of fuels used, energy can make up as much as 25% of the total cost of tea production in the East Africa Tea Trade Association (EATTA) member countries. Present sources of electricity used for processing of tea are often unreliable, expensive, and greenhouse gas intensive. Small hydropower which is generally available at or near tea estates can provide a clean and reliable source of renewable energy while reducing costs to tea factories at the same time.

29. Electricity is an essential input for the tea industry. For logistic reasons, tea factories are located close to tea plantations, that is to say, in rural and hilly areas. Given that tea grows only in terrains relatively high above sea level and requires high rainfall, it becomes clear that there are “synergies” between production of tea and generation of electricity from hydropower plants. This has been the main idea behind the GTIEA project design: hydropower is an obvious option for an industrial activity located in areas with a high hydro potential and whose supply of electricity has, up to now, been expensive, unreliable and/or environmentally harmful.

30. An average of 0.65 kWh of electricity is generally needed to process one kilogram of tea. Variation in average power consumption occurs due to climatic conditions in each tea growing region. In Rwanda for instance, most tea is processed in the dry season (July through September), when less electricity is required for withering. In Uganda on the other hand, tea production remains steady throughout the year. During the two rainy seasons power consumption is higher in the withering process as the ambient air is more humid. There are also significant variations in the efficiencies of the equipment being used in the tea factory.

Electricity usage in the EATTA countries was found to range from 0.59 kWh in Kenya to 0.74 kWh per kg of made tea in factories in Uganda.

31. As for the economic aspects, considering only the costs related to electricity for each ton of tea made, total electricity costs per ton of made tea range from US$ 48 in Malawi to as much as US$ 307 in Rwanda when both the tariff for grid electricity and expenses for diesel power backup are included. The electricity expenses of tea factories are dependent on the price of grid electricity, reliability of the grid and the cost of backup power (and diesel back up electricity is much more expensive than grid electricity). Moreover, grid electricity prices are directly dependent on the proportion of electricity generated by diesel units connected to the grid (apart from back up diesel gensets located in the tea factories), which is very high in many cases. The price of electricity on grids which are highly dependent on diesel generation and the cost of power backup are both strongly dependent on increasing international oil prices. This has especially negative implications for the competitiveness of tea from countries like Rwanda, where a large part of the electricity supplied to the grid comes from diesel units and at the same time the supply from the grid is very unreliable, forcing the tea factories to extensively use their own diesel gensets.

32. The GTIEA project Executing Agency, EATTA is a central organization in the export of tea from Africa. It is a voluntary membership organization including as members tea producers, buyers (exporters), brokers, packers and warehouses. EATTA member countries account for some 28% of the total tea exported in the world, most of it through the Mombasa Auction. The Mombasa Auction, established and managed by the EATTA, is a major success story becoming the world's largest auction centre in 2004. The total amount of auctioned tea, which has grown by a remarkable 300% in the past 20 years, offers tea from all the major African tea producing countries. It is recognized as a World Tea Auction Centre and international blending floor, following the closure of the London Tea Auction in 1998. Mombasa auctions are conducted in US Dollars and assure a steady inflow of hard currency into tea producing countries in Africa. Clearly EATTA is a very adequate option to support activities like those included under the GTIEA project.

33. The GTIEA project has covered eight tea producing countries in this region: Burundi, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, and Zambia, all of which are members of EATTA. Of these, the Project decided to build up SHPs in Kenya, Rwanda, Uganda and Tanzania, based on criteria such as interest of the corresponding tea factory owners, availability of appropriate SHP sites, results of the pre-feasibility studies, suitable legislation for SHP in the corresponding country, and existence of water flow data. The generated power is primarily devoted to meet the needs of the tea factories, and the additional power generated is/will be used to electrify neighbouring communities to the tea factory/estate or fed into the national grid.

B. The Project

34. As indicated in the previous paragraphs, the rationale behind the GTIEA project has been to cover one necessity of the tea industry (to have a reliable source of electrical energy cheaper than other options), through the use of a technology (generation of electricity by hydropower plants) which is environmentally friendly and has the possibility of providing some extra income to the main business through selling the surpluses of electricity generated.

35. The detailed analysis of the situation of the tea industry in Eastern African countries contained in the Project Document clearly shows that the project responds to acute necessities of the tea industry. Not surprisingly, the response obtained from relevant actors of the tea industry has been in general positive.

36. A first set of project objectives included the realization of ten full feasibility studies for hydropower plants in selected sites in at least four EATTA countries, six of which were to be developed with commercial implication of the tea industry. Pre-feasibility studies were to be carried out in the remaining EATTA countries. All the studies have been carried out, but the project term has proved to be too short to finish construction works in all the sites; only one plant was commissioned, whereas another two are under construction at the time of the Final Evaluation, and three have not yet began to be built, although decision to build them has been taken. Another objective was to facilitate financial modalities, and this has been done quite successfully.

37. A second set of objectives refers to engaging consultancy and manufacturing firms in small hydropower development and to formulate standards. In this sense the project has found many difficulties due to the lack of qualified and competent manpower in some areas, which has been solved through use of foreign companies and individuals. It can be said that future SHP developments will be easier as a consequence of the project efforts.

38. The third set refers to electrification of neighbouring communities through use of surpluses of electricity generated beyond the necessities of the tea factories. In general the most frequently adopted approach has been to supply those surpluses to the network, through a feed-in tariff system, whose development has been strongly influenced by the project activities in several of the considered countries. It must be said that the development of a feed-in tariff system (or a Power Purchase Agreement model) is a basic pre-requisite for the penetration of newcomers (Independent Power Producers (IPP)) in the electricity supply system of any country, as it has been the case in many Western countries. This is especially important in countries with a low degree of electrification and an acute necessity of capacity for electricity generation, as it is the case in all the GTIEA participating countries. In this sense the project has played a clearly important role.

39. Besides the above, in some cases the generation capacity of the SHP has been designed to supply electricity to more than one tea factory; this has resulted in the necessity of negotiating with the energy authorities a wheeling tariff to be paid for the supply of electricity to distant factories. This has also created precedents which will be very useful to encourage participation of other industrial sectors and newcomers

40. Apart from tea factories there are other target groups for the project, at different levels. First of all, financing institutions are extremely important for projects requiring large investments (although running costs after commissioning are low).

41. UNEP and AfDB have collaborated with the EATTA (as Executing Agency) in the realization of the proposed tea factory based small hydro project investments. The Project Steering Committee consisted of tea producers, as represented in the EATTA – Board, representatives of the government (Ministries of Energy) and regulatory bodies, UNEP and AfDB as the co-Implementing Agencies. Representatives of tea factories which are participating in the pilot projects also had representation on the Project Steering Committee. In those EATTA member states where actual pilot projects were (or were being) developed, a National Steering Committee was formed consisting of the tea processing sectors (e.g. Tea Board / Association) and the Government (e.g. Ministry of Agriculture).

42. As the Executing Agency, EATTA hosted a Project Management Office (PMO), in which international and regional experts worked on all the tasks defined, creating an enabling environment for small-hydro development in tea factories, rural electrification, hydro pre-feasibility and feasibility studies including detailed design, training of technical staff in civil engineering and electrical engineering sector as well as tea factory technical staff and liaise with Ministry of Energy /Industry etc. and national utilities. The PMO supported a number of tea factories to implement pilot small hydropower plants on a commercial basis; this started with carrying out detailed feasibility studies, negotiating a market for the energy produced, mobilizing investment and financing, and finally carrying out actual execution of the pilot projects. During this implementation phase there were direct linkages between the EATTA Project Management Office and the individual tea factories. Hands-on training sessions were provided to the entire national tea sector as well as to the civil engineering/electrical engineering sectors (industry associations, consulting/engineering firms etc.).

43. The Project Management Office of the EATTA has worked with policy makers and regulators, with the tea factories, financing institutions, and the engineering community in the EATTA countries to increase investments into small hydropower projects to supply the tea sector. The PMO periodically reported to the Steering Committee.

44. Major stakeholders in the project were tea factories and communities living in their vicinity without electricity. Tea factories were contacted through EATTA. Communities were consulted in the process of carrying out scoping exercises and pre-feasibility studies, and were further engaged during the detailed feasibility studies. KTDA, which represents smallholder owned tea factories and has consulted extensively with local communities, was strongly involved in the Project preparation. Government officials involved in the regulation of the power sector and formulation of power sector policies are very important stakeholders. These policy makers participated in the regional workshop during the preparation of the Project and were also represented in the Project Steering Committee and National Steering Committees in countries which will host pilot small hydropower projects. Financial institutions and engineering, consultancy, contracting and equipment manufacturing companies are other groups of key stakeholders. They were visited during Project preparation and also participated in the regional workshop. They were invited to engage strongly during the Project period during the

detailed feasibility studies, through training and capacity building, and during project construction.

45. The tea factories are making substantial commercial investments into the six pilot small hydropower projects. In order to reduce their risks and increase their confidence in the sector, some 13 prefeasibility studies were carried out during the PDF-B Full Size Project preparation phase. The increased interest and confidence in the sector was evident from letters received showing significant interest, including financial commitments, from 14 tea factories and associations from 6 EATTA countries. Within the Project period itself a total of 10 Detailed Feasibility studies were carried out. Six pilot projects were commenced in the Project period, although, given the shortness of the project duration, only one project was finished and two others are still under construction. Of the remaining ones, one (in Uganda, see paragraph 53 below) has been discarded and the others have reached financial closure.

46. The EATTA has been the principal proponent and stakeholder. The EATTA board members were informed of the project proposal by its Secretary and their opinion was sought with the aim of providing feedback to UNEP GEF. As a follow up to these consultations, a draft concept note was circulated by the EATTA to its board members and later presented at a board meeting. During the meeting the board members were also individually consulted with the aim of establishing their interest and commitment.

47. Individual tea companies were also met and the project discussed further with them. These companies also presented views and sought clarifications on the project. Not only did the EATTA board members explicitly indicate support and interest in the project, but also several individual tea companies showed their interest as investors.

48. A website http://greeningtea.unep.org was set up by EATTA and UNEP where all relevant documents were posted throughout the PDF-B project period. It now holds an impressive list of background documents as well as the project documents for this Project. The Website provided an opportunity for those who were interested in the Project to follow closely its progress and provide inputs. It has been actively used by tea factories, EATTA, consultants, UNEP, banks and construction and equipment supply companies in the course of the project and afterwards; it has also been useful for the Evaluation Team.

49. In the course of the project and after discussions with the directly involved stakeholders, it became clear that the initially proposed average size of the plants was too small. Interest had been created in a number of tea factory owners to get involved in, for them, a new business branch of selling electricity to the network, and some others decided to supply or to plan to supply electricity to more than one tea factory, no matter the distance. The Project managed to channel all these suggestions for change and to modify the size of the plants (and hence the financial requirements) accordingly.

50. Apart from the above, it was soon realized that the initial project term (four years) was too short (standard duration of a SHP project from pre-feasibility to commissioning is about six – seven years), and the project was subsequently extended (without modification of the total

budget) in two occasions, having eventually a total duration of 63 months (from August 2007 to end-October 2012).

51. Only one of the SHP was commissioned: Tagabi, in Kericho (Kenya), in March 2011, which was an enlargement of an already existing small hydropower plant. The Gura construction site, also in Kenya, was visited during the evaluation and was found to be about 15% complete. Gura SHP construction works started in November 2012 and it is scheduled to be commissioned in March 2015. Giciye, in Rwanda, has the canal about 80% complete and is scheduled to be commissioned in December 2013, although the Evaluation Team estimates that two or three more months will be necessary.

52. Kipchoria and North Mathioya (both in Kenya) have not yet started construction, but their developers have initiated the respective implementation processes (discussions with energy authorities about wheeling tariff for electricity has been a cause of delay, since these plant are designed to supply electricity to several tea factories located at some distance of each other).

53. Suma, in Tanzania, is also to be implemented. In Uganda, in spite of GTIEA efforts, Igara Growers Tea Factory has decided not to build the Nchwera SHP, due to the financial requirements of construction of new tea factories and upgrading existing ones. It is worth noting that the GEF Secretariat always insisted in the geographical distribution of GTIEA projects to include countries where viability, or interest for that matter, for SHP development was less evident. Therefore, instead of focusing only on highly prospective sites, such as the ones in Kenya, GTIEA pursued development of SHP also in more challenging set-ups, such as in Nchwera.

C. Evaluation Objectives, Scope and Methodology

54. The objectives of this Terminal Evaluation (TE) were to assess project performance (in terms of relevance, effectiveness and efficiency), and to determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability, and based on this assessment identify lessons of operational relevance for future project formulation and implementation.

55. The general approach of the evaluation was to start with a detailed review of relevant documents, including those initially defining the project (made available by UNEP), the contents of the project website, and later to held initial meetings with UNEP officials engaged in the project. The next step was to meet relevant stakeholders and, whenever possible, officials in charge of the project in the relevant countries, as well as to analyse new documents and energy policies of the relevant countries.

56. The evaluation criteria to be applied are specified in the evaluation ToR (Annex 1 of the present report), and are classified in four groups:

- Attainment of objectives and planned results
- Sustainability and catalytic role
- Processes affecting attainment of project results
- Complementarity with UNEP programmes and strategies

57. The first three groups of criteria require, among other things, meetings with project participants and stakeholders, whereas the fourth can be dealt with just by analysing project definition, objectives, etc. in the relevant documents. Therefore for the referred three sets of criteria a set of key questions and a selection of relevant indicators were prepared previously to the initiation of field work and country visits. These questions and indicators are shown in Annex 7.

58. The evaluation Team Leader (Mr. Blasco) visited the UNEP Evaluation Office and the project Task and Fund Management Officers in Nairobi and the East African Tea Trade Association in Mombasa, as well as the project demonstration site of Gura in central Kenya, Nchwera in the Bushenyi district of western Uganda and Giciye in north-west Rwanda. He was also engaged in meetings with all relevant project stakeholders at the project sites as well as in Nairobi, Kampala and Kigali.

59. As for the Supporting Consultant (Mr. Mutimba), he also visited the UNEP Evaluation Office and the project Task and Fund Management Officers in Nairobi and the East African Tea Trade Association in Mombasa (together with Mr. Blasco). He also visited project demonstration sites of Tagabi in western Kenya, Gura and North Mathioya in central Kenya, and Suma in Western Tanzania as well as engaged in meetings with all relevant project stakeholders at the project sites as well as in Nairobi and Dar es Salaam.

60. The general approach followed during the site visits was to deal with them as if they were independent projects, and to apply guidelines defined in Section D of the evaluation ToR. The same approach was applied at all sites visited and the same set of general, but individually adjusted questions were addressed to all stakeholders. In this way it was guaranteed that the same treatment was given to each project site.

61. Unfortunately, due to budget constraints, it has not been possible to visit all the project sites, and the country visits (apart from Kenya) have been too short, hence it has not been possible to meet all relevant stakeholders.

62. Another limitation the Evaluation Team encountered was that the project staff left the project after its termination and are now engaged in other projects/activities, in many cases in other countries, limiting communication to phone conversations or email exchanges. It is suggested that in future projects the availability of key project staff is guaranteed to the evaluation team, perhaps through contractual obligations.

63. Financing (amount and sources). The actual amount of cash spent as at the end of the project was far less than the planned amount because the project ended before assisting with mobilization of cash from financial institutions and other sources for construction (see Table 3).

II. Project performance and impact

A. Attainment of Objectives and Planned Results

Achievement of Outputs and Activities

64. The following paragraphs 65 to 70 contain an overview of the quality and achievement of outputs that contributed to the five project outcomes defined in the GTIEA Project Document. Paragraphs 71 to 73 contain Theory of Change (ToC) analysis, whereas more data and evaluation of outcomes are included in paragraphs 74 to 83.

65. Outputs that contributed to the achievement of **Outcome 1: "**Investment confidence established in SHP sector among investors, project developers and financing institutions":

- Ten full feasibility studies completed: The project design had a target of ten full feasibility studies, including detailed design completed for small hydropower demonstration projects in at least four (4) EATTA countries. At the time of the Mid-Term evaluation -- eight (8) feasibility studies had been achieved covering four countries – Kenya, Uganda, Tanzania and Rwanda, although their quality was in general poor, problems arose with the contracting companies and the feasibility studies had to be complemented and improved by new contracting companies; all this resulted in considerable delays. At the end of the Project, twelve (12) feasibility studies were completed for KTDA factory sites alone, with support from Ministry of Energy. This is satisfactory, although EATTA informed that some of them were finished considerably behind schedule and had to be reviewed to improve their

quality; during a site visit to the Giciye SHP (Rwanda), the Evaluator was informed that the feasibility study had to be improved due to unreliability of the river flow data; a more detailed hydrological study was necessary.

The Mid –Term Evaluation Team reported concern about cleanliness of the water (and possible negative impact over the Pelton turbines), possible problems derived from sedimentation, and plant automation. The Final Evaluation Team has found that no special de-silting measures have been taken, and automatic cleaning of the intake gratings is not contemplated.

Both feasibility studies (Gura and Nchwera) analysed cover a number of the necessary fields, are sufficiently detailed and are made according normal practice, although it has to be said that, in the case of Gura (the Nchwera project has not been considered by the SHP owner (Igara Growers Tea Factory)), the solution finally adopted contemplates a power output of 5 Mw, whereas the feasibility study contemplated 2.8 Mw; this reflects from one side the growing interest of the tea factory in improving its income through sales of electricity to the network, but on the other side one wonders why this new power output was not even contemplated as a possibility in the feasibility study (a complete feasibility study should cover different possible power outputs, and the Gura study does so, but it does not consider the solution finally adopted), according to the different site possibilities, morphology and structure of the terrain, existence of other SHP or plans to use the river basin, possible alternative uses of water, etc.). It has to be said that the available information about river water flows was scarce and estimations were necessary, although the site visits have confirmed that the estimations made seem to be reasonable.

- At least six small hydropower projects developed with commercial investment from the tea industry: it must be said that this output was unrealistic, since the construction time of a SHP is very site-dependent and can take 6 - 7 years. Nevertheless, one plant has been commissioned (Tagabi, in Kericho (Kenya), which is an enlargement of an already existing SHP, and hence easier to develop than any of the other GTIES SHPs), two have commenced construction at the time of the Final Evaluation (Gura in Kenya (about 15% completed)) and Giciye in Rwanda (about 60% completed), and the construction of another three (Kipchoria and North Mathioya (both in Kenya) and Suma, in Tanzania) has been decided. In Uganda, Igara Growers Tea Factory has decided not to build the Nchwera SHP, due to economic reasons (IGTA decided to use the available funds to increase production of tea).

  Leaving apart that the project time span was too short, this result can be considered relatively satisfactory if it is combined with the fact that the plant sizes have been increased and that a high degree of interest in SHP has been created among the tea companies. But it is essential to guarantee an adequate operation and maintenance of the plants after commissioning.

- Five additional pre-feasibility studies with accompanying training completed in remaining EATTA countries. Apart from the six GTIEA SHP countries mentioned above, the project website contains only feasibility studies for Malawi, but there are other pre-feasibility studies for Kenya, Uganda, Rwanda and Tanzania. All the pre-feasibility studies seem to be sufficiently detailed to give in principle the necessary information to take decisions about possible construction; nevertheless the Evaluation Team did not visit the sites and did not have the necessary resources to make a complete evaluation of the studies.
- Financing modalities facilitated for small hydropower. Tagabi, Gura, Giciye, Kipchoria, North Mathioya and Suma have adequately completed their respective financial schemes, but it has to be said that the wording of the output is quite ambiguous; it can give the impression that the idea behind it was to create a financing scheme to be applied to any SHP, which is clearly unrealistic. Nevertheless, the precedent created by the six GTIEA SHPs will undoubtedly have a positive effect on future activities in the field of SHP.

66. Outputs that contributed to the achievement of **Outcome 2:** "Technical Capacity enhance in EATTA countries to design, construct and fabricate associated equipment":

- Five Eastern/Southern African consultancy/engineering and construction firms engaged in small hydropower development. – At the end of the project, five local consultants and engineering firms were engaged in design, construction, and commissioning of SHP plants, but some of them did not perform satisfactorily and had to be replaced; some firms had experience in large hydro projects, but not in SHP, whereas others had SHP experience, but the personnel specified in their bids lacked the necessary experience. The result was that the feasibility studies had to be improved; this can be considered as a consequence of the low degree of development of SHP in the EATTA countries, but, once again, the project activities have undoubtedly improved the experience, interest and capabilities of Eastern/Southern African consultancy/engineering/construction in the field of SHP.
- Two Eastern/Southern African manufacturing firms engaged in producing components for small hydropower. Tagabi was constructed by local civil engineers and manufacturers. The penstock was fabricated locally and the electro mechanical parts were imported. Due to the delay experienced during feasibility studies as a result of lack of expertise in CAD, GTIEA project conducted AutoCAD training to KTDA Power Company engineers.
- Increased local value added in small hydropower development. Local value addition of the project during evaluation was evidenced in the construction of Gura and Giciye SHP, where local engineers and construction workers were provided with employment. Other areas will have to wait until actual construction begins (see paragraph 66 above).
- Quality standards for small hydropower formulated and proposed to concerned authorities in Bureau of standards, utilities, and Association of Engineers in EATTA countries. Again, this was an unrealistic project output; it is not reasonable to expect

that with a very limited number of plants it is possible to formulate standards (SHPs are very site-dependent); nevertheless it has to be mentioned that Nepal Quality Standards for Mini Hydro Projects were handed over to various Ministries of Energy in the region. Clearly the experiences gained through GTIEA activities will be useful at the time of defining standards.

- These outputs were achieved in a moderately satisfactory (MS) manner.

67. Outputs that contributed to the achievement of **Outcome 3:** "Models in place for private-public participation in rural electrification through small hydropower":

    - Two feasibility studies completed for viable models to demonstrate small hydropower based RE project electrifying neighbouring communities. Some of the SHP feasibility studies mentioned in the above paragraphs contemplated the sale of electricity to neighbouring communities (see Paragraph 80 below), but this cannot be considered a model. It seems that the general interest of the SHP owners is moving towards the direct sale of surplus electricity to the network, rather than to concrete neighbouring communities, but this will clearly result in a higher general degree of electrification in each country, hence is a positive effect. During the Final Evaluation it was found that Renewable Energy Authorities in Kenya, Uganda, Tanzania and Rwanda have shown interest to support rural electrification, however a model doesn't exist, hence this is moderately satisfactory.

68. Outputs that contributed to the achievement of **Outcome 4:** "Regulatory environment enabled to be conducive to SHP IPP investment and rural electrification in EATTA member countries":

    - Regulations conducive for licensing of small hydropower generation by IPPs formulated and proposed for EATTA countries. After the GTIEA project termination, the situation varies in the different countries. This output was, once again, unrealistic, since one or two SHPs in each country cannot reasonably be expected to result in regulations enabled for SHP. But undoubtedly the project activities have had a strong influence on the improvement of the regulatory environment for much-needed participation of independent power producers in the electricity sectors of EATTA countries; the already mentioned increase of SHP capacity is largely derived from the interest of the owners in the sale of surpluses of electricity to the networks (in other words, in their interest in acting as IPPs). It is worth to mention that the improved regulatory environment can also have positive effect on other technologies, apart from SHP.
    - Regulations conducive for private sector involvement in small hydro based rural electrification formulated and proposed to authorities in EATTA countries. This output is unrealistic due to the same reasons as above, and cannot still be completely evaluated, since many tea factories have opted for the sale of surplus electricity to the general transmission & distribution grid instead of directly supplying to concrete neighbouring communities, but such regulations for IPPs are already in place in Kenya, Uganda and Tanzania, although not exclusively oriented

towards SHP. Rwanda is in the process of implementing policies and regulations for IPPs, including wheeling charges for electricity. The number of IPPs in these countries is still low, and more experience is needed to judge the adequacy of the present regulation; experience in other countries has shown the advantages of simplification. Nevertheless, as indicated above, the general result of having some surplus electricity supplied to the general grid is a positive effect of the GTIEA project.

69. Outputs that contributed to achievement of **Outcome 5**: "stage set for establishment of a viable 'standard PPA' in EATTA member countries for small hydropower":

- The project has clearly succeeded in improving the regulatory environment for PPA in all EATTA countries; discussions with the electric utilities and regulatory authorities have resulted in the already mentioned increase in plant sizes and consequent selling of much larger amounts of surplus electricity to the respective networks. This has resulted in conversations with the respective utilities to define prices for supplied electricity, which will pave the way for future projects of the same or similar type.
- Draft standard PPA formulated and proposed to authorities in EATTA countries. According to normal practice in many countries, it is necessary to distinguish between Power Purchase Agreements (PPA) and feed-in tariffs, which are applied to electricity supplied from any source which is advantageous from the environmental viewpoint (renewable, cogeneration, …). In the case of feed-in tariffs, they depend on the type of primary energy consumed (wind, min-hydro, photovoltaic, solar thermal …). Three countries (Kenya, Uganda and Tanzania) have feed in tariff systems (too low in the case of Tanzania). Except in the case of Kenya, the feed in tariff is not yet standard, and efforts to have a standard tariff are still being pursued. Rwanda does not have SPPA however, different IPPs are supplying electricity and the tariff is negotiated on a case by case basis.

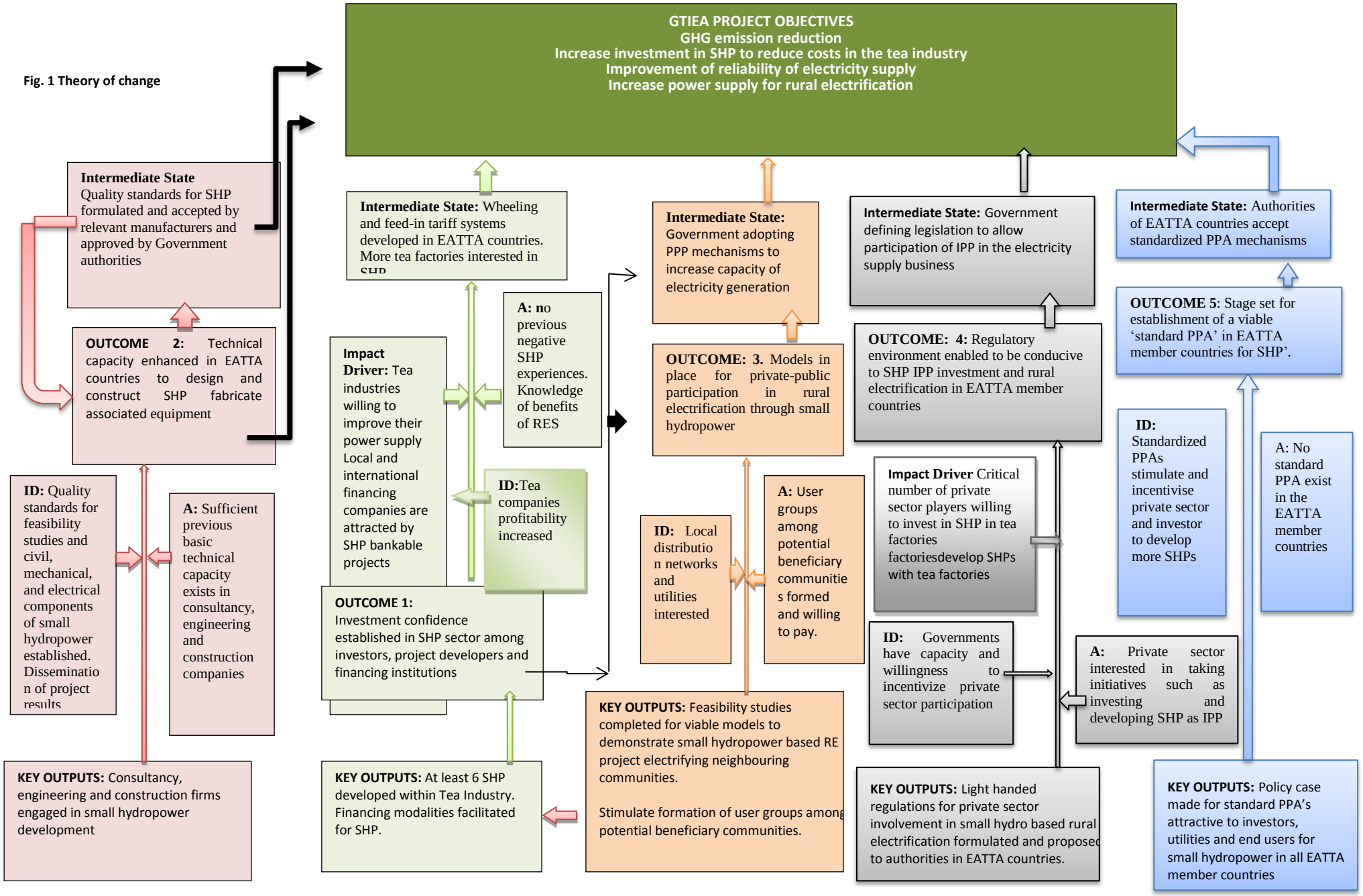
70. Using the theory of change (ToC), the evaluation team identified the project objective and main project outcomes and assessed how the delivered outputs contributed towards their achievement. The intermediate states between outcomes and ultimate goals were also identified and assessed pointing out assumptions and impact drivers, in order to determine whether the project design is logical and that implementing the specific activities and outputs will lead to the desired results and impact. It is worth to emphasize that if the intermediate states are reached (which does not depend but it will be influenced by the project activities) they will have a very relevant positive influence over the project final goals. A more detailed description of the Impact Pathways and Review of Outcomes to Impact (ROtI) analysis can be seen in Annex 5.

71. The ToC diagram below illustrates impact drivers, assumptions and intermediates states between output, outcome and the main impacts and impact pathways. It is important to note that, beside those indicated in the diagram, there are several assumptions and impact drivers

that have to be taken into account, although they are not specific of a concrete project output/outcome:

- Communication of project objectives, activities and results is a very important impact driver, also in other countries.
- The same can be said about contacts with universities, technical schools, etc.
- A basic assumption is that no social upheaval occurs in any of the considered countries.
- Termination and commissioning of the pending SHP will play a very important role; it has to be considered a basic impact driver.

Fig. 1 Theory of change



72. It is the view of the Terminal Evaluation (TE) team that, the GTIEA project general objective, as stated in the original Project Document approved in 2005 (*" to promote investment in small hydro power through a reduction of the electrical energy costs in the tea processing industries in countries covered by the East African Tea Trade Association and meanwhile increasing power supply for rural electrification and power reliability as well as reducing greenhouse gas emissions through removal of barriers related to financial weaknesses, lack of technical awareness and capacity as well as all obstacles related to power sector policy frameworks"*) has been reached to a satisfactory degree.

73. The following paragraphs detail the project effectiveness and achievements:

- ***Outcome 1****: Investment confidence established in SHP sector among investors, project developers and financing institutions*

74. There was significant achievement on this outcome though not in all the countries. Unilever Tea Company in Kenya obtained 1.2 MUSD for construction of Tagabi SHP which was completed in March 2012. Financing was also achieved by KTDA affiliated tea companies in Kenya; KTDA now has a wholly owned subsidiary called KTDA Power Ltd which at the time of the evaluation had committed funds to a tune of 27.5 MUSD and had plans to roll out 23.87 MW as Phase I of their SHP development; Giciye SHP in Rwanda had secured a grant of 3.2 MUSD from Daey Ouwens Fund, an international donor, banks had provided 5.5 MUSD and the Rwanda Mountain Tea (RMT) factory raised equity funds amounting to 2.8MUSD for the 4 MW project making a total of 11.5 MUSD, indicating that there is confidence in the Giciye project. However, no evidence indicates that a specific project-oriented financing scheme that encourages mini-hydro development in East Africa has been created and most financing obtained was a result of the project creating infrastructure and awareness that led to financiers opening their purse. The project therefore attained a **satisfactory** rating as far as this outcome is concerned.

- ***Outcome 2****: Technical Capacity enhanced in EATTA countries to design, construct and fabricate associated equipment*

75. Apart from Tagabi-Kericho, already commissioned, so far two more small hydro plants are under construction, that is, the Gura Hydro Power Project in Kenya and the Giciye SHP in Rwanda. Three others had completed feasibility studies and developed bankable proposals, namely the Suma hydro power project in Tanzania and North Mathioya and Kipchoria in Kenya. Nchwera in Uganda will not be constructed due to other priorities of the owner (IGARA Tea Company).

76. It has to be said that Outcome 2 is ambiguous and difficult to evaluate. If civil works and equipment (penstocks, valves, etc.) are considered, then the demand created by the GTIEA SHP has certainly, to some extent, contributed to enhance technical capacity, and the same can be said of standard electrical equipment. On the other side, six SHP are insufficient to promote design, construction and fabrication of specific equipment (Pelton turbines, generators, etc.). The project can therefore be said to have obtained a **moderately satisfactory** rating as far as this outcome is concerned.

- ***Outcome 3****: Models in place for private-public participation in rural electrification through small hydropower*

77. Although not in the form of general models, there were significant achievements on this front mainly in Kenya, as can be demonstrated by the fact that KTDA now has a wholly owned subsidiary called KTDA Power Ltd which at the time of TE had one hydropower engineer heading a consultancy unit charged with responsibility of managing the supervision of the design, operation and later on the maintenance of on-going power plant which is under construction. In Tanzania, one engineer was trained; however he has left Wakulima Tea Company, the sponsors of Suma SHP project. Graeme Watson, a local consultancy firm, was involved in the development of feasibility studies for Tagabi SHP. This involvement, according to the owner of the company, enhanced the capacity and confidence of the local company in SHP. This same company was also involved in the specific training designed for engineers that were carried out at the Jomo Kenyatta University of Agriculture and Technology, funded by GTIEA. One of the beneficiaries of this training has been employed at the KTDA Power Company. GTIEA also hired a Hydro Power Trainee further enhancing local capacity. In addition sub-consultants were engaged, for environmental and surveying assignments. Moreover, the following training activities were carried out:

1. A Regional Training on Small Hydropower Design for Civil Engineers in East Africa which was conducted in collaboration with Jomo Kenyatta University of Agriculture and Technology (JKUAT) and attended by 21 participants drawn from Kenya, Uganda, Tanzania, Rwanda and Malawi representing consultants, government agencies and developers. The objective of this training was to address the technical capacity gap identified in design for SHP.

2. GTIEA developed a 'small hydro power' course and was to be incorporated in JKUAT curricula, which is to be used to develop an on-going course of Hydro Power development. The TE team made calls to the university with a view to find out more about the curriculum but was still waiting to hear from JKUAT at the time of writing up this.

78. With the above and despite the lack of confirmation of the progress on curriculum, this outcome can be rated as **satisfactory** in the whole region.

- ***Outcome 4****: Regulatory environment enabled to be conducive to SHP IPP investment and rural electrification in EATTA member countries*

79. One of the outcomes of this project was supposedly the connection of un-electrified households and nearby institutions both commercial and non-commercial. The Gura Hydro Power station has stated that upon completion it will electrify nearby schools, hospitals and households at a cost. Suma Hydro Power Station has mobilized local community to assist in the lobbying for political support in the hope that they will benefit by being electrified. Rural electrification is a subsequent undertaking to SHP implementation, and this will be realised upon project implementation. The Tagabi project began supplying power to its staff and nearby clinics and schools due to GTIEA project influence. The project can be said to have

influenced a private-public participation in rural electrification, though these effects cannot be completely evaluated until all the SHP plants contemplated under GTIEA have been commissioned. For the time being, the rating here is **moderately satisfactory**.

- ***Outcome 5****: Stage set for establishment of a viable 'standard PPA' in EATTA member countries for small hydropower*

80. The National Steering Committees (NSC), a platform created at national level, was active in four of the member countries: Kenya, Tanzania, Uganda and Rwanda, in which policy and regulatory issues influencing the SHP projects were discussed. GTIEA, with the support of other stakeholders, lobbied relevant authorities through the NSCs in Kenya, Tanzania Uganda and Rwanda to fasten licensing, and put in place renewable energy tariffs (ReFiT). All the four countries have put in place ReFiT structure and power purchase agreement (PPA). But, a fixed pre-determined tariff has yet to be concretely achieved. In Kenya it has been fixed at US 8 to 9 cents per KWH. In Rwanda there seem to be a pre-determined rate. In the case of Tanzania the tariff is low, making private project viability unsustainable. The project performed **moderately satisfactorily.**

81. In general terms, awareness on potential for SHP as technically viable, economically feasible and environmentally friendly alternative to current (conventional) practices has been raised in all the GTIEA countries. This is perhaps the field where the project has performed highly satisfactorily. Most of the stakeholders consulted were of the view that awareness on SHP was not only created but heightened by the project. One of the stakeholders, who is employed at Energy Regulatory Commission of Kenya (ERC) and ex- KTDA employee, put it aptly as: KTDA never ever thought that they would develop SHP projects because there rivers were small a*nd did not have enough water! But GTIEA through the project made this possible thereby creating awareness across the tea industry in the region. Despite low uptake of SHP during project per*iod, the high awareness will translate to more projects in future. These views were shared in Wakulima Tea Company in Tanzania and the chair of NSC in Kenya.

82. Considering the assessment of individual outcomes above, the **overall rating for Effectiveness is Satisfactory.**

83. The table below shows how the ROtI analysis has assisted in assessing each step of the causal pathway from activities to achievement of outputs and to outcomes to impact.

Table 2. Review of Outcome to Impact

Results Rating of the Greening the Tea Industry in East Africa (GTIEA) project							
OUTPUT	OUTCOME	Rating A-D	INTERMEDIARY	Rating A-D	IMPACT	Rating (+)	OVERALL
Six mini-hydro demonstration projects established in at least 3 EATTA member countries; preferably with an attached rural-electrification component. Financing modalities facilitated for SHP.	1- Investment confidence established in SHP among investors, project developers and financing institutions.	B	Wheeling and feed-in tariff systems developed in EATTA countries. More tea factories interested in SHP.	A	Operating plant results in reduced GHG emissions. Two more plants under construction: investments made.	BA	HL
Five Eastern/Southern African consultancy/engineering and construction firms engaged in small hydropower development.	2- Technical Capacity enhanced in EATTA countries to design, construct and fabricate associated equipment.	B	Quality standards for SHP formulated and accepted by relevant manufacturers and approved by Government authorities.	C	GHG emission reduction.	BC	ML
Two feasibility studies completed for viable models to demonstrate small hydropower based RE project electrifying neighbouring communities.	3- Models in place for private-public participation in rural electrification through small hydropower.	B	Governments adopting PPP mechanisms to increase capacity of electricity generation.	C	Neighbouring Communities in Tagabi able to obtain electrical power. Those living near Gura Hydro are also in line to receive electrical power once commissioning is done. RE results in improved standard of living.	BC	ML
EATTA project facilitation skills enhanced & project implementation committee operational.	4- Regulatory environment enabled to be conducive to small hydropower IPP investment and rural electrification in EATTA member countries.	B	Government defining legislation to allow participation of IPPs in the electricity supply business.	B	Country driven-replication is taking place in Kenya, Rwanda and Tanzania.	BB	L
Policy case made for standard PPA's attractive to investors, utilities, and end users for small	5- Stage set for establishment of a viable 'standard PPA' in EATTA member countries for small	B	Authorities of EATTA countries accept standardized PPA mechanisms.	B	The Policy/Regulatory framework for promotion of small hydro projects including standard power purchase agreements and feed-in-tariff are in	BB	L

hydropower made in all EATTA countries. Draft standard PPA formulated and proposed to authorities in EATTA countries.	hydropower.				place in Tanzania, Rwanda, Uganda and Kenya. Governments in these countries have shown desire to encourage private sector investment in renewable energy. How well these policy and regulatory frameworks, SPPA and feed-in-tariff work will be seen in the future.		
	Rating Justification Only one plant commissioned (although the objective of having six plants commissioned in five years was too optimistic). Feasibility studies carried out; technical capacity enhanced. Rural electrification of neighbouring areas not materialized, although some compromises are established. Public-private partnerships not officially established, but some precedents created. Regulatory environment improved as result of the project activities and outputs. PPA defined on a case-by case basis: valid precedent for creation of a favourable policy for PPAs.	**B**	**Rating Justification** Wheeling tariffs discussed and adopted in some cases: precedent established for future plants. Some other tea factories interested in SHP. Number of SHP at present insufficient to define quality standards, but standards from other countries applied Interest on PPP created, and still more on IPP participation. Precedents created: some PPA accepted.	**A**	**Rating Justification** Although not all the SHP have been commissioned, the evaluation team has found that a vivid interest exists in the tea industry to reduce costs and improve reliability of electricity supply. Rated power of initial SHP has been increased; hence there will be surpluses of electricity for electrification of neighbouring areas and for supply to the distribution networks. The fact that concrete legislation about PPPs, IPPs, PPAs, etc. has not been officially adopted is less relevant than it seems at first sight; interest has been created, and this will sooner or later result in more attractive conditions for future investments. **A tendency towards the global project goals has been created, and there is no sound reason to think it will not materialize.**	**BA**	**HL**

Efficiency

84. The project has been efficient with respect to financial management and financial mobilization for co-financing. Although the selection of projects for feasibility studies, tendering for consultants to perform feasibility studies, tender award and supervision of consultant's work arguably took too much time due to imperfections of the feasibility studies and to bureaucratic requirements of both UNEP and EATTA, all the feasibility studies were eventually completed, two EPC tenders awarded (for Gura and Giciye) and construction finished in Tagabi. There was good progress at Gura SHP despite the cancelling of the contract of M/s Hsiung International of China for the construction of Gura SHP and replacing it with M/S V S Hydro (PVT) Ltd., a Sri Lankan company which was the second lowest bidder to undertake the construction of Gura SHP after some disagreement. The Gura Plant was initially 2.8 MW but has now been optimized to 5MW with an estimated project cost of 14.75 MUSD.

85. The GTIEA Project has benefitted from past experiences in other countries (Sri Lanka and Nepal) with similar characteristics: relevant tea industry, high SHP potential, etc. Use of these experiences (including field visits to relevant sites) has undoubtedly played a relevant role to create interest among GTIEA stakeholders and to create confidence on the GTIEA objectives.

86. In terms of **cost-efficiency**, out of a budget allocation of USD 2,854,000, the amount of USD 2,755,516 has been spent by the end of 2012 according to the audited reports covering the period January to October 2012, that is 96.6%, of allocated funds had been spent by the time the project was coming to an end. Given that the project had a number of delays, the fact that such a very high percentage of funding was expended on the project in spite of delays means that the project adequately managed its financial resources. Despite the high turnover of Fund Managers, the TE team established that financial reporting was done in a timely way. Revision of the entire project document was also carried out every time the project had budget neutral extension to cover for the delays. For instance the project document had to be revised to extend the final closure of project from May 2012 to October 2012. In addition a standalone audit of the GTIEA project was always carried out annually for the entire period of the project. An examination of the audit reports has not shown any anomaly and the opinion of the auditors is that the project finances were efficiently managed.

Rating for Efficiency: Satisfactory (S)

Relevance

87. The relevance of the project can be assessed from three points of view: First of all, tea companies are located in more or less remote rural areas and although most are connected to the national electricity grid, there is very poor supply of electricity, which is prone to power outages and disruptions, and hence most tea companies operate diesel generators for emergency and back up supply, leading to emissions of CO_2. The implementation of SHPs in the tea growing zone can therefore contribute to reduction of CO_2. Thus SHP are relevant in terms of providing a steady supply of electricity, stabilizing the grid and reducing greenhouse gas emissions, which was and is still at the core of this project.

88. Secondly, according to available documentation and from the stakeholder interview, tea industries spend over 60% of their budget on provision of both thermal and electrical energy. The aim of GTIEA project was informed by the fact that supplying power from SHPs appears as a lower cost alternative to grid or back up diesel supply in the medium to longer term. This lower cost aspect is considered very relevant for the sustainability of the industry and has clearly had a deep impact on the tea factory owners at the time of deciding to build SHPs. As such the most relevant approach was to design SHP capacity optimized for lowest kWh cost, grid connection, supply of all electricity needs of nearby tea factories, and sale of surplus power to the grid, based on a solid PPA. This is precisely what Gura Hydro Power project which is under construction is aiming to do after commissioning. Tagabi SHP on the other hand supplies all its electricity to the tea factories and when there is a surplus, especially during low peak period, the plan is to sell it to the grid. The wheeling of power (that is evacuating power from SHP to a tea factory or any other nearby user through a utility transmission infrastructure) is an important element.

89. Thirdly, rural communities are often poor and discriminated against as far as provision of electrical power is concerned. The construction of SHP for tea factories will may have additional local benefits, in that in addition to supply of electricity to the main user, GTIEA could also satisfy the need for nearby community centres, institutions and households to be electrified. The Tagabi SHP has managed to supply electricity to neighbouring communities, and Gura is planning to do so.

Rating for Relevance: Satisfactory (S)

OVERALL RATING FOR ATTAINMENT OF PROJECT OBJECTIVES AND RESULTS: SATISFACTORY (S)

B. Sustainability and catalytic role

Sustainability

90. As already indicated elsewhere in this report, the initial objective of having six SHP commissioned at the time of project termination has not been reached; only one plant (Tagabi-Kericho, an enlargement of an already existing SHP) has been commissioned, whereas other two (Gura in Kenya and Giciye in Rwanda) are under construction, two have finished their feasibility analysis and committed their financing (Kipchoria and North Mathioya in Kenya and Suma in Tanzania) and one (Nchwera, in Uganda) has not been initiated. Hence the decision of construction has been taken in five sites, for which adequate financing has been obtained and the plant owners and relevant stakeholders (including energy authorities) are interested in their termination.

91. It has also been mentioned that the installed capacity is considerably larger than initially contemplated in the Project Document (PD), which indicated an initial size of about 500 kW each (this was the assumption adopted about the necessities of electrical energy for a standard tea factory); instead of this, installed capacity of Gura (Kenya) is 5 MW, Kericho 0.85 MW, Kipchoria 3 MW, North Mathioya 5 MW, Giciye (Rwanda) 4.5 MW, Suma (Tanzania) 1.5

MW. The modified Project Document indicated a minimum total final capacity of 10 MW, which is to be widely surpassed. A relevant cause for these enlargements has been the interest of the owners (tea factories) to increase their profits (this fact reveals a high degree of confidence in the outputs of the feasibility studies), apart from larger environmental benefits, improvements in reliability of supplies, etc. In fact, figures for final capacity were changed several times in some cases (Gura, Giciye).

92. A first consequence of this is that in general the amount of electrical energy generated will be more than sufficient to cover the demand of the corresponding tea factories, and consequently a larger share will be devoted either to rural electrification of neighbouring areas or to export to the respective national grid. The favourable environmental impacts of the project will consequently be increased, since, apart from the reduction of use of diesel gensets in the tea factories, a larger amount of electricity from a renewable energy source will be supplied to other users. Nonetheless, it is worth mentioning that in many cases the selected option has been to sell the surplus electricity to the local electric utility, which does not necessarily imply any improvement in the degree of rural electrification of the neighbouring communities. Another positive effect of the project has been that, since selling prices of electricity surpluses have been discussed with regulatory agencies, these agencies have become more familiar with the fact that the price of a commodity such as electrical energy should not be fixed in a bureaucratic manner; market forces have significance and must be taken into consideration. Clearly GTIEA has played a catalytic role among the energy regulatory agencies of the project member countries in the field of policies related to wheeling tariffs for independent power producers, feed-in tariffs mechanisms and schemes to encourage use of renewable energy sources for electricity generation, etc. In fact, many of these policies have been created or modified along the course of the project and, although it cannot be said that the existence of the project has been the only cause, it has become clear from meetings with energy authority officials of these countries that the efforts carried out by the project teams have had a clear influence.

93. A requisite of the utmost importance for the long term successful impact of the project is an adequate operation and maintenance of the plants. Although operation and maintenance of run-of-the-river plants is not especially complicated, the fact is that up to now, the owners (tea factories) have no experience in maintenance of SHP, and there is a potential risk that plants are not adequately operated and maintained. The Evaluation Team has detected that in general the owners are aware of this, and the possibility of sub-contracting maintenance has been contemplated. It can be said that the main project impact (development of a more sustainable and competitive tea industry and rural electrification through wider use of environmentally friendly energy options will be reached (although with considerable delays with respect to the initial targets of the project) to a larger extent that previously envisaged, but it is essential that adequate maintenance is guaranteed.

94. From the socio-political viewpoint it seems obvious that the degree of consciousness of stakeholders about the advantages (lesser costs, reduced negative environmental impact, better reliability) has increased as a result of the efforts carried out by the project teams to create awareness, commitment and incentives among stakeholders, with the only exception of

Igara Growers Tea Factory (IGTF) in Uganda, which has shown a low degree of interest in SHP (it is worth to mention that the Ugandan energy regulatory authorities and other stakeholders are very interested in the development of hydro plants). Moreover, EATTA has recently decided to commit itself to the development of renewable energy sources (not only hydro power) as stated during the Global South-South Development Expo which has taken place in Nairobi from 28th October to 1st November 2013.

95. Last, but by no means least, the rural communities living in sites neighbouring areas have shown a positive attitude to the respective projects, due to a) satisfaction with the amounts received for expropriations, b) possibilities created to get jobs during construction (the project teams have adopted the positive attitude of engaging as much local manpower as possible, including women), and c) possibility of getting access to electricity in their homes.

Rating for Socio-Political Sustainability: Highly Likely (HL)

96. In terms of financial resources, the sustainability of project results and the eventual impact of the project are dependent on continued financial support from bankable project proposal development to plant commissioning. After this has been accomplished, and since the running costs of this type of plant are zero (apart from maintenance), it is guaranteed that on one side the generated electricity will be much cheaper than any other option, and from the other the sale of surplus energy will be a continuous and stable source of cash. Out of the 8 projects which underwent feasibility studies, one has already been commissioned and there is very high likelihood that another five SHPs will be built (two already under construction). This is because the project has attracted financial support from multilateral and international financing, from local banks, private equity funds. Since tea companies spend over 60% of their budget on energy, there is very low if any financial risk that may jeopardize sustenance of project results and onward progress towards impact, as the tea factories stand to benefit from SHP and therefore will ensure there maintenance and substance in order to save costs. The anticipated formation of GTIEA 2 as a commercial company to oversee on-going project that are being built can be said to be concrete efforts to ensure financial sustainability of results and benefits.

Rating for Financial Sustainability: Likely (L)

97. As for the institutional framework, the Evaluation Team has detected in general a positive attitude. Apart the competitiveness of SHP-produced electricity against electricity from the national grids, which was adequately analysed at the time of carrying out the feasibility studies, it is clear that the future maintenance of an adequate level of feed-in tariffs for the surplus of electricity to be supplied to the grid is a relevant issue to guarantee maintenance of project impacts. At present, with the only exception of Tanzania (where feed-in tariffs are low) and to some extent in Kenya, where the process of revision of feed-in tariffs is slow and the intervals between revisions of feed-in tariffs too long, the situation is favourable (to the extent that Rwanda Mountain Tea Ltd. (RMT) is contemplating a new SHP (Giciye II, downstream of Giciye I, the present plant under construction) with the exclusive objective of selling electricity to the national network (output from Giciye I is more than sufficient to cover the demand of

the tea factories in the area)). In Kenya, KTDA contemplates 10 more SHP projects, with a total estimated capacity of approximately 25-30 MW; if other players are considered, a total of 80-100 MW for the entire country seems to be a realistic figure.

98. All the consulted officials of the energy regulatory authorities have shown a high degree of consciousness about the SHP potential in their respective countries, although there is an extended lack of data relative to concrete potential, river flows and hydro - geological issues.

Rating for Institutional Sustainability: Likely (L)

99. The environmental benefits of the project were adequately calculated and, apart from electricity outputs larger than envisaged, there are no foreseeable environmental factors which can influence the future flows of project benefits.

100. As indicated above, the plant capacities (and hence their capabilities to replace oil-generated electricity) have been considerably increased with respect to the initial specifications contained in the Project Document.

Rating for Environmental Sustainability: Highly Likely (HL)

OVERALL RATING FOR SUSTAINABILITY: LIKELY (L)

Catalytic role and replication

101. The catalytic role and possible replication of SHP covered by the GTIEA project has been investigated by the Evaluation Team at three levels: owners, regulatory authorities and, where possible, associations of industries.

102. From the viewpoint of owners of the plants contemplated under GTIEA, the situation varies from Uganda, where IGTF has shown little interest in SHP, (construction of the plant has not started and is at present not contemplated), to Rwanda, where construction of Giciye SHP has still not been completed but nevertheless RWT has already carried out a pre-feasibility study of a future Giciye II. In Kenya the attitude of both individual GTIEA SHP owners and the East African Tea Trade Association (EATTA) are clearly favourable to the construction of more plants, and EATTA can supply the necessary expertise (at the time of project start-up it was difficult to move the tea companies from their initial business to a completely new one as is the generation and supply of electricity, but eventually the response was positive, and EATTA considers that the initiation of the IGTF project in Uganda is a matter of time). In Tanzania, the low level of the present feed-in tariffs for this type of plants is an inconvenience for the profitability of this business, but the advantages of self-production from SHP are widely recognized. As for Kenya, the analysis of Gura and Kipchoria SHP carried out by GTIEA (Seminar on Wheeling Tariffs organized by GTIEA) was a good initiative, since experience has shown that interest from tea companies for selling of surpluses of electricity is continuously growing and wheeling tariffs is one of the main issues to be considered by any Independent Power Producer (IPP) to decide whether to enter the electricity supply business.

103. The attitude adopted by IGTF (Uganda) seems to obey to different motivations; from one side, the company has indicated that its financial resources were limited and that the option of building up new tea factories and improving existing ones has been preferred to making investments in generation of electricity (an unknown type of business for IGTF). But this was also the case for other tea companies in other countries in which responses have been far more favourable to GTIEA initiatives.

104. Besides the above, Kenya Tea Development Agency (KTDA) created in the year 1964, has created in 2010 a new branch (KTDA Power Company Ltd.) devoted to electrification of the tea industry in Kenya. This is a creation of the GTIEA project and is playing a relevant role in the field of further electrification. At present it is finalizing tender processes for four more SHP with a total installed capacity of 11.3 MW. Furthermore, KTDA is working for the development of other renewable energy sources for use in the tea industry (e.g. biomass for heating and drying purposes, and wind power).

105. Although no institutional and policy changes can be direct and univocally due to the project activities, the energy regulatory authorities consulted in all the countries visited have shown a deep knowledge of the GTIEA initiatives in the context of a general interest in the use of renewable energy sources for generation of electricity. This interest is of course not only focused on hydro energy, but all the regulatory agencies consulted have a high degree of consciousness about the potential for development of small hydro units. In general the respective governments have preferred to supply financial resources to large hydro projects, leaving SHP to private initiative. Given that the private initiative is, in principle, reluctant to invest in fields in which it has no experience or where experience is very scarce, the very fact that GTIEA has succeeded in starting so many SHP projects has undoubtedly played a very positive role in the development of behavioural changes of many important stakeholders. But it is essential that these project are adequately finalized and that the results are adequately disseminated if this tendency is to become consolidated. There are certainly many SHP running very satisfactorily in the world, but this is not sufficient; success in domestic projects under local conditions in African countries is essential, and in this sense GTIEA has played (and is playing) a very important role.

106. Approximately one year after the project termination, no replication has still materialized (the initial four-year term of the project was definitively too short), but perspectives are very favourable, and at least one replication is about to materialize (Giciye II in Rwanda). The initiatives adopted (dissemination of project results, seminar on wheeling of energy, etc.) by the project to encourage replications were well designed and, given the limitations derived from the short term, can be considered as successful, including Uganda, where in spite of the IGTF scepticism, a clear interest on this type of projects has been shown by the Private Sector Foundation and the Energy Resources Department. Especially important and successful have been the efforts the project has devoted to get financing means for SHP; given the very nature of these plants, which require large investments whereas running costs are very low, to create interest among investors and donors was a task of the utmost importance.

107. It is worth mentioning that several relevant stakeholders have indicated support for the idea of a continuation of the project (GTIEA II) perhaps including use of other renewable energy sources apart from SHP.

108. It has been detected that in many countries (e.g. Uganda and Rwanda) there is a very limited amount of information about potential for SHP; annual variations of river flows in suitable places, nature of the terrain, etc. The situation is better in Kenya, and this is probably the reason for which prospects for SHP are better (during evaluation visits only very general information about potential was supplied). Nevertheless, and with the exceptions mentioned above, it can be said that the project activities have successfully improved the interest from authorities and relevant stakeholders in projects of this type in Kenya, Uganda, Rwanda and Tanzania. It is worth to take into consideration that all the considered countries are in dire necessity of more capacity for generation of electricity, not only due to the low degree of access to electricity (especially in rural areas) but also for the frequent shortages in the already existing networks, due to the continuous increases in demand, lack of availability of existing generating units, inadequate maintenance of assets, etc.

Rating for Catalytic Role: Satisfactory (S)

C. Processes affecting attainment of project results

Preparation and readiness

109. The project background is solid and well described. The same can be said of the project design, including the description of the barriers to be overcome and how the project should remove these barriers. The project objectives and outcomes are in general reasonably defined, as well as the target groups and stakeholders; the only objection to be made is that the initial project time span was too short; four years are clearly insufficient to develop a SHP project from the pre-feasibility study to final commissioning, as experience repeatedly has shown in projects of the same nature. A more realistic approach would have been to consider 6 - 7 years, and this was already emphasized at the project formulation stage, but GEF secretariat decided to limit the initial project design to four years.

110. The Project Document contains detailed roles and clearly defined responsibilities of each entity participating in the project. The election of EATTA as the executing agency was very reasonable, given its contacts and good position to encourage initiatives of this type among tea producers in East Africa.

111. Risks were analysed and described in a detailed way, and measures to avoid/mitigate them were included in the Project Document. Apart from the lack of reference to the possibility of political turmoil and/or social upheaval in the considered areas, it is worth noting that one of the risks described (analysis used for the feasibility study and project design is based on inadequate historical river flow data) is directly related to the initial assumption of an average size of 500 kW for each SHP; cause of this seems to be an estimation of the average demand for electricity of a standard tea factory, without sufficient consideration either of electrification of neighbouring areas or of the very nature of the plant sites (a too small hydro

plant puts a burden on future optimal development of hydro power generation potential of a certain river); not surprisingly, it was found later that the real size could be much larger, which resulted in increases of the expected budgets and delays in the estimated construction programme.

112. Needless to say, financing is a very important chapter in a project of this nature; financing plan was carefully prepared keeping in mind the commercial viability and future potential for replication of the project. Clearly an important effort has been made to guarantee adequate sources of financing, both from beneficiaries (tea factories), governments and other donors, including co-financing for technical assistance from other donors (e.g. EU).

113. Initial budget has been prepared in a reasonable way. Only a more detailed evaluation and description of monitoring and evaluation costs is missed. In fact, just a lump sum is indicated for evaluation purposes, insufficient since it does not allow for visits to all the project sites.

Rating for Preparation and Readiness: Satisfactory (S)

Implementation Approach and Adaptive Management

114. The Project Management Office (PMO) under the supervision of the Project Steering Committee (PSC) and with technical advice from an Executive Committee of the PSC was the main management and implementing arm of the GTIEA project. PSC was composed of members drawn from UNEP, EATTA, AfDB and NSC. EATTA chaired the PSC meetings, which provided the project with policy guidance and direction. EATTA also provided infrastructure such as housing of the project office. According to all the stakeholders consulted, the project ran smoothly from its beginning, and the encountered difficulties were dealt with adequately (it is worth to mention the difficulties arisen from lack of trained personnel in some areas, which was solved through contacts with companies from countries with large experience in similar projects and activities). It has also to be said that the decision to modify the size of the plants to adapt them to the real circumstances of each site was adequate, in spite of delays and increases in total project costs (see paragraph 5 in pages iii-iv above).

115. In the implementation of the project, the PMO worked very closely with the management of individual tea factories and other organizations associated with the tea industry. The PSC supervised the activities of the project through regular consultations and reporting by the NSC. The NSC was not as active as had been anticipated during design stage partly because it was constituted rather late and was only visible mostly in Kenya, Rwanda and Uganda but lacked a budget line to assist in its operation.

116. The PMO was very well staffed and led by a Project director, a fund manager, an accountant, IT expert, a hydro expert etc.; in total a professional team of seven people, although there was limited knowledge about project financial structuring. The project experienced very high turnover partly because it had a slow start, there was a delay in disbursement which slowed down activities and partly because of lack of job security for employees who wanted a longer term contract. Two PMO Directors and one Assistant PMO Director left to pursue other interests. This caused disruption and slowed down project implementation momentum due to

loss of institutional memory and time spent on new hiring. Despite the challenges and given the nature and geographical scope of the project, the PMO was effective in managing eight feasibility studies and assisted in the EPC tenders for Gura, Giciye and Tagabi as well as providing technical support to KTDA Power Company (KPC) through the hydro specialist who is now employed by KPC. Although the mid-term review gave the PMO a moderately unsatisfactory rating, there has been improvement thereafter and the implementation arrangement can be said to have performed moderately satisfactorily towards the end.

117. It is to be emphasized the fact that the project successfully managed to adapt itself to the new circumstances arisen, including modification of the previously envisaged capacity of the plants and, to some extent, to the longer time required for commissioning of the plants. At the time of the Final Evaluation only one SHP has been commissioned, but the necessary measures to reasonably guarantee termination some others have been taken. The project committees and units have carried out their duties in a quite satisfactory way. No relevant difficulties and lack of understanding among UNEP, AfDB, EATTA and plant owners (tea factories) have been detected; contacts and discussions seem to have been fluid and constructive.

118. In cases when difficulties arose (financial requirements from the consultancy company (Graeme Watson & Associates) in charge of Kenya GTIEA SHP feasibility studies, problems with the Chinese company in charge of Gura feasibility study), the project management dealt adequately with them and was able to find reasonable solutions.

119. The Mid-Term Evaluation made a set of recommendations referred to socio- political sustainability, ecological sustainability, technical issues in feasibility studies and recommendations on the way forward.

120. The recommendations on socio-political and ecological sustainability were referred to maintenance of adequate river flows, good relationships with local communities, role of NGOs and efforts to establish national policies for sustainable watershed management. All of them were followed, with the only exception (in the under-construction SHP sites visited) of building fish ladders; according to information obtained in the project site this was considered unnecessary given the scarcity of aquatic life in the rivers.

121. The technical recommendations were referred to analyse convenience of tunnelling instead of building long canals (discarded in the sites visited due to cost reasons), more detailed hydrological analysis (done), silt handling (considered), level of plant automation (considered) and consideration of turbine part-load efficiencies (done).

122. The recommendations on the way forward referred to practical issues, most of them related to the evidence that the Project time span was too short to get all its outputs. Clearly the PSC has managed well to define priorities and bring the project to a satisfactory end.

123. The usual processes (licenses, expropriation procedures, financing agreements, etc.) did not present special difficulties, and no special administrative, operational or technical problems have been found up to now. Certainly the nature of the terrain has posed some difficulties in

some sites at the time of building, but this is usual in this type of work, and in the opinion of the Evaluation Team they have been faced adequately.

Rating for Implementation Approach and Adaptive Management: Satisfactory (S)

Stakeholder participation and public awareness

124. Dissemination of both project objectives and general information about the advantages derived from self-production of electricity from SHP was in general carried out adequately. The main initial difficulty was the lack of knowledge of SHP characteristics and technology among stakeholders, mainly owners (tea factories), but on the other side the realization of a careful study of the tea industry, its necessities of electricity and the disadvantages derived from an unreliable supply from public networks was an important strength and clearly had very positive effects. The only exception was IGTF in Uganda; the tea factories' owners were not completely convinced of the advantages derived from SHP.

125. Apart from UNEP and the GEF, the main project stakeholders were AfDB (very important from the viewpoint of creation of interest among donors and financial institutions), EATTA, KTDA and owners of tea factories. Countries and places where GTIEA SHP should be located were selected taking into consideration a number of main issues, such as interest from each tea factory, availability of good SHP sites in rivers in the vicinity of tea factories, adequacy of legislation for use or renewable energy sources in the respective country, support from relevant country energy authorities, environmental considerations, existing infrastructures, results of the pre-feasibility studies, etc.

126. Communication among different stakeholders has been found to be satisfactory, including both the project responsible bodies (defined in Table 34 of the Project Document) and those directly or indirectly affected by the project results in each country/project site.

127. Attitude of the energy authorities was found to be positive, and all of them were familiar with the project (also in Uganda); clearly the dissemination efforts carried out by the project teams were positive and successful. No opposition was found in the neighbouring communities, in any of the sites.

Rating for Stakeholder Participation: Moderately Satisfactory (MS)

Country Ownership and Driven-ness

128. Tea factories have not only demonstrated ownership of SHP projects, but have also shown much more initiative and creativity by coming together in order to develop SHPs within their boundaries. For instance, Gura SHP is owned and has equal share from four tea factories located in the Gura river site area. The four factories have formed a Gura SHP Company Board to supervise the construction. On the other hand, Wakulima Tea Company in Tanzania, does not only own Suma SHP project, but the holding company's board has made it a part of their agenda to discuss the anticipated development of the SHP. In both cases, the policy support from the national regulator and the rural electrification agency is very strong.

129. At national Ministry level, Rwanda, Kenya, Tanzania, and Uganda have demonstrated ownership, including membership of senior government staff taking active part in the NSC, and partly funding the Feasibility Study of Gura SHP by the Ministry of Energy, Kenya. The Private Sector Foundation of Uganda has also taken an active role and strongly supports the implementation of more SHP projects, emphasizing the necessity of looking for new plant owners in case of lack of interest of those previously selected.

130. Policy/Regulatory frameworks for promotion of small hydro projects including standard power purchase agreements and feed-in-tariffs are in place in Tanzania, Rwanda, Uganda and Kenya. Governments in these countries have shown desire to encourage private sector investment in renewable energy. The Government of Kenya is in the process of reviewing the energy policy to put in place a more enabling environment for Small Renewable Energy sources in line with the new Constitution. There are proposals to introduce energy banking, net energy metering and Standard Power Purchase Agreement both aimed to facilitate a quick role of small renewable energy projects. However, the application and practicalities of these policy and regulatory frameworks, SPPA and feed-in-tariff will only be proven after the commissioning of the SHPs which are under construction.

131. Governments have promoted the participation of communities, for instance Kibolgong community approached GTIEA project through EATTA for technical assistance in the development of a micro hydro project in Bomet. A site visit was made and a design review report prepared. GTIEA continues to provide the community project with technical support as the need arises to facilitate development.

132. The formation of functional NSC chaired by government shows that the four governments – Kenya, Rwanda, Tanzania and Uganda were responsive to EATTA and GTIEA.

133. In response to a request by GTIEA through UNEP, the East African countries showed positively their commitment to improve the standard feed-in-tariff and wheeling charges and SPPA which are prerequisite to building investor confidence.

Rating for Country Ownership and Driven-ness: Satisfactory (S)

Financial Planning and Management

134. Examination of available finance documents and interview with the fund manager has revealed that there was adequate financial planning and control of financial resources throughout the project's lifetime. Budgeting and disbursements were done in accordance with procurement procedures and regulations. A summary of the GEF project spending (provided by UNEP fund manager) is shown in the two tables below including the planned and actual expenditure. Details of budgets, expenditure and co-financing allocated to each activity are given in Annex 4 of this report.

Table 3: A summary of project spending

UNEP Code	Item	Actual sum total	Total Budget	Unspent Balance
1100	Project Personnel	1,329,900	1 268 834	-61066

1200	Consultants	873398	1 028 548	155150
1600	Official staff travel	102291	81 748	-20543
3200	Group trainings	217688	157 793	-59895
3300	Meetings/Conferences	84233	48 880	-35353
4100	Expendable equipment	23120	20 583	-2537
4200	Non- expendable equipment	42968	44 432	1464
4300	Premises rent	18940	19 386	446
5100	O&M equipment	17868	44 866	26998
5200	Reporting and Publications	25890	40 821	14931
5300	Sundry communication	50155	41 031	-9124
5500	Evaluation	67548	57 080	-10468
	GRAND TOTAL USD	2853999	2 854 002	3

Table 4. Status of financing and co-financing sources both cash and in kind

Co-financing (Type/Source)	**Planned**	**Actual**	**Total disbursed (US$)**
Cash contributions			
GEF Trust Fund	2 854 000	2 854 000	**3,135,126.20**
Tea Factories	7 000 000	24 932	
Financial Institutions	15 000 000		
EATTA	96 000	12 000	
Coopener	-		
AfDB	-		
Pro invest	130 000	2 441 947	
	Total:	**25,080,000**	**3,135,126**
In Kind			
EATTA	109 526	558 101	**355,358**
Coopener	418 600		
AfDB	224 640		
Pro invest	130 000	288 513	
Coopener/EC Others	614 000		
Construction Companies	220 000		
Government	2,680,000		
	Total:	**3,782,766**	**355,358**

135. The TE team has verified that there was proper financial management, timely planning of budgets, and timely requests of budget changes and reallocation. However, the TE team has noted that tendering and administrative processes for recruitment of consultants and procurement of project equipment took longer due to the nature of the project and thus affected the delivery of reports and delayed disbursement in some cases.

136. Project received co-financing to the tune of Ksh 16,593,173.00 (equivalent to US $ 195,213.8 at the exchange rate of US1 to Ksh 85.00). The breakdown of final actual costs and co-financing for the different project components are Annexed (Annex 4).

137. The project implementation partners and beneficiaries were able to leverage more financing as shown below and elsewhere in the document: Unilever Tea Company in Kenya obtained 1.2M USD for construction of Tagabi SHP which was completed in March, 2012. Financing was also achieved by KTDA affiliated tea companies in Kenya, KTDA now has a wholly owned subsidiary called KTDA Power Ltd which at the time of TE had committed funds to a tune of 27.5 MUSD and had plans to roll out 23.87 MW as Phase I of their SHP development; Giciye SH in Rwanda had secured a grant of 3.2 MUSD from Daey Ouwens Fund, an international donor, banks had provided 5.5 MUSD and the Rwanda Mountain Tea (RMT) factory raised equity funds amounting to 2.8 MUSD for the 4 MW project making a total of 11.5 MUSD indicating that there is confidence in the Giciye project.

Rating for Financial Planning and Management: Satisfactory (S)

UNEP-AfDB supervision and backstopping

138. The structure and control mechanisms implemented were reasonably designed and have given a clear idea about the progressive development of the project; imperfections of the project design were quickly detected and causes of delay recognized. Reactions in each case were adequate, and the main difficulties adequately faced. Especially important have been the efforts made to convince financing entities to supply the necessary funding for the project activities.

139. Analysis of the project PIRs indicate that they are designed to give a clear idea of the project development; the outcomes have been carefully monitored, and ratings are well defined and clearly reflect project real situation, potential risks, etc.

140. The collaboration and relations between the Executive Agency (EATTA) and UNEP were entirely satisfactory and fluent, according to information obtained during meetings with EATTA and UNEP. In fact, the enthusiastic support given by some high level EATTA officials at the time of project preparation played an important role. EATTA did not make any complaint about the support received from UNEP.

141. The Task Manager (TM) at UNEP provided supervisory and backstopping support for the PMO through regular consultation and demand for regular monitoring reports. UNEP TM's support contributed to control in financial expenditure and the need for PMO to tighten dealings with the FS consulting firms. UNEP and AfDB cooperation was positive and provided the project with much needed experience in the renewable energy field; AfDB did play a very supportive role at the Feasibility Studies stage (preparing "bankable documents"). However although AfDB was envisaged to play a more active role in advising tea factories and the project in

general on the development of bankable projects and mobilising financing for the same, the information gathered from the field was, according to the project TM, that the bank could have done better. Very little financing was mobilised by the bank and factories hardly received specialised advice on bankable project development. An interview with the AfDB representative revealed that the Bank general policy is to consider SHPs as too small for their involvement; individual SHP appeared to be too small for Private Sector financing (Bank finances typically 1/3 of any Private Sector project with a minimum of around USD 7.5 million, this requiring projects with a minimum of USD 22 million, or roughly 7 MW) As such the Bank representative is said to have played a role of assisting with bringing in small and country specific banks to provide financing for the GTIEA projects. AfDB is still negotiating with KTDA the financing (including re-financing of Gura and Mathioya) of a cluster of forthcoming SHPs. The impression obtained by the Evaluators is that AfDB tried but could perhaps have done better. UNEP supervision and backstopping role can be rated as satisfactory.

Rating for UNEP-AfDB Supervision and Backstopping: Satisfactory (S)

Monitoring and evaluation

142. Apart from Table 27 (Project Logical Framework), Table 31 of the Project Document contains definitions of indicators for evaluation of project execution performance, whereas Table 32 of the same document defines project outputs, outcomes and milestones; in general, indicators and milestones are clearly defined and easily quantifiable. Nevertheless, it has to be said that some outcomes are very general and difficult to measure, and some indicators seem to be somewhat arbitrary: for instance, Outcome 2 fails to consider that most of the electrical equipment necessary for SHP is not SHP-specific, and that the fabrication of specific equipment (e.g. Pelton turbines and injectors) is only justified if a large demand exists; it cannot reasonably be expected that the construction of six SHP is sufficient to create a hydro turbines manufacturing company. On the other side, it is unclear how “small hydropower investment attractiveness spilling over to non-tea sector” (fourth indicator of Outcome 1) can be achieved. The number of SHP constructed by non-tea sectors by the project end is not a reasonable criteria; a four-year project whose objective is to embark an industrial sector in a completely new activity cannot reasonably expect to be able to embark other sectors in the same activity. Certainly, if tea-financed SHP proves to be successful and their success is adequately divulgated, they will have a replicating effect to other sectors, but this will be necessarily a very long term effect. “Investment attractiveness” is very difficult to quantify.

143. Table 33 defines both key performance indicators and the respective methods of data collection for all the project outputs and outcomes. All of them are clearly defined and are easily measurable; it seems obvious that careful consideration has been given to the necessity of carrying out a detailed monitoring of the project development.

144. The assumptions made are realistic, as well as the assessment of the possible risks; the only exception is that the possibility of socio-political turmoil (unfortunately possible in Africa and elsewhere) has not been considered.

145. Baseline case (project not being carried out) and alternative case (project carried out) have been defined and the corresponding final situations quantified in a way that must be considered as realistic.

146. Table 34 of the Project Document adequately defines responsibilities of each entity participating in the project, including monitoring and evaluation responsibilities.

147. The initial project budget was prepared in a reasonable way. Only a more detailed evaluation and description of monitoring and evaluation costs is missing, as already indicated elsewhere in this report. In fact, just a lump sum is indicated for Mid-Term and Final Evaluation purposes, insufficient since it does not allow for visits to all the project sites.

148. Analysis of the PIRs and other monitoring documents indicated that the monitoring plan was carried out according to the previously determined schedule throughout the entire period of project implementation. The same can be said of annual progress reports, whose analysis (and that of correspondence among project responsible bodies) indicate that the project deviations were duly and timely considered by the responsible project participating entity.

Rating for Monitoring and Evaluation: Moderately Satisfactory (MS)

D. Complementarity with UNEP and GEF programmes and strategies

Achievement of GEF Strategic Objectives

149. The project has contributed towards the following GEF Strategic Objectives: *GEF Operational Program* OP5**:** *Removal of barriers to energy efficiency and energy conservation* and OP6*: Promoting the adoption of Renewable Energy by removing barriers and reducing implementation costs.* From the viewpoint of OP6, the project has promoted generation of electricity from run-of-the-river hydro plants, which is a renewable form of energy, in the tea industry, by assisting establish an appropriate tariff structure and PPA, which have helped remove barriers to electricity generation by private sector, and reduced costs, in terms of bureaucratic red tape that was time and resource consuming.

150. As for OP5, the project has heightened awareness on the role of SHP in providing cost-efficient electrical power, thereby educating and influencing a critical mass to advocate for consideration of installation of SHPs in the rural electrification programmes. This was evident from the interviews held with the regulators who reported increasing inquiries from rural based tea industries on how to develop and install SHPs. GTIEA project provided training and technical assistance thus instilling confidence in project owners, developers and financiers as far as overcoming barriers and risks associated with investment in energy projects. It was on this basis that all the six feasibility studies were completed, bankable proposals developed and two EPC contracts negotiated and commissioned.

151. In as far as reduction of implementation costs in OP6 is concerned, GTIEA project assisted project owners and developers by financing upfront costs such as feasibility studies, and making available technical and financial advisory services thereby reducing upfront costs.

Although this was limited to six SHP projects, the project has caused the existence of human and technical infrastructure such as the presence of hydro power engineers and consultant in the region thereby ensuring the lowering of costs for those companies interested in developing SHPs in future.

Achievement of GEF Strategic Priorities

152. *SP-2: Increased access to local resources of financing for renewable energy:* As shown earlier, there was tremendous achievement as far as financing is concerned. Both from documents reviewed and from our interviews, it is clear that local financial institutions submitted their expression of interest to finance a number of SHPs including Gura SHP (Kenya). Three local banks are engaged to roll out credit for energy projects with funds from AFD, the French Development Agency. Gura Power Company, formed by four tea companies together with KTDA, obtained 77% of the required 35% equity investment in the Gura SHP, thus attracting a number of local commercial banks in the region (KCB, CFC-Stanbic and CRDB in Tanzania) with interest in lending to the Renewable Energy sector. Rwanda Mountain Tea Ltd. has arranged equity of 3.3 MUSD and bank loan of 5.2 MUSD to finance the Giciye project. Unilever Kenya financed Tagabi upgrading with 100% equity and if it does get approval of a wheeling tariff, EPK will also largely finance using equity but also use loan funds from a local bank.

153. *SP-3: Power sector policy framework supportive of renewable energy*: The Policy/Regulatory framework for promotion of small hydro projects including standard power purchase agreements and feed-in-tariff are in place in Tanzania, Rwanda, Uganda and Kenya. Governments in these countries have shown desire to encourage private sector investment in renewable energy. The Government of Kenya is in the process of reviewing the energy policy to put in place a more enabling environment for Small Renewable energy sources in line with the new Constitution. There are proposals to introduce energy banking, net energy metering and Standard Power Purchase Agreement both aimed to facilitate a quick role of small renewable energy projects. However, the application and practicalities of these policy and regulatory frameworks, SPPA and feed-in-tariff will only be proven after the commissioning of the SHPs which are under construction.

Complementarity with UNEP Programmes and Strategies

154. The Project has also shown clear complementarities with the UNEP Medium Term Strategy 2010 – 2013, in spite of having started well before the implementation of the Strategy. Of the six cross – cutting thematic priorities contemplated, GTIEA is mainly related to the first of them (Climate Change), since one of the UNEP expected accomplishments is "*that countries make sound policy, technology, and investment choices that lead to a reduction in greenhouse gas emissions and potential co – benefits, with a focus on clean and renewable energy sources, energy efficiency and energy conservation*". Use of SHP (renewable energy source) in the tea industry results in reduction of greenhouse gases from emergency diesel gensets (and from thermal plants connected to the corresponding country network), and improves efficiency (since transmission and distribution losses decrease due to the proximity of SHPs to the tea factories).

155. GTIEA activities are also clearly adapted to the guidelines contained in the UNEP Programme of Work 2010 – 2011 and 2012 – 2013.

South-South Cooperation

156. It is worth to mention the importance of the South – South cooperation between Nepal and Sri Lanka from one side and the GTIEA countries from the other; the large expertise in both the tea industry and the development of SHP of Nepali and Sri Lankan companies and individuals have played a very relevant role in the GTIEA activities, especially considering that the collaboration of experts from Europe would have been far more expensive and perhaps less pragmatic, given the different technological level of GTIEA and European countries.

III. Conclusions and Recommendations

Conclusions

157. The GTIEA project has adopted a good approach when selecting an industrial sector (tea industry) which is relevant to the economies of all the selected countries and whose installations (tea factories) are located in areas where it is reasonable to assume the existence of important hydro resources (zones where there are plantations of tea). It was also a good idea to engage an association of tea producers as the executing agency of the project, as a matter of dissemination of the project objectives among a large number of owners of tea factories and at the same time to engage an institution with a deep knowledge of the tea business.

158. With only one exception (IGTF Ltd. in Uganda) the project succeeded in embarking tea factories into a completely new type of business: generation of electricity. In this sense it was very appropriate to carry out a detailed and well documented study about the tea industry, the required consumption of electrical energy, the quality of electrical supply, the necessity to use emergency diesel gensets, etc. This also required discussion with the relevant energy authorities to determine wheeling tariffs for supply to distant (or relatively distant) tea factories, as well as feed-in tariffs for excess electricity being supplied to the respective national network; although the project efforts are not the only force, all this has undoubtedly resulted in a higher degree of consciousness of these authorities at the time of dealing with newcomers (Independent Power Producers) to the electricity supply business and to an advance in the creation of methodologies to encourage use of renewable energy sources and hence in the creation of much needed capacity for electricity generation.

159. The project has also been successful at the time of convincing banks and other investors to supply funds for the respective projects; given the relatively low number of SHP in the selected countries it was of the utmost importance to create interest in financing institutions for this type of business. In this sense, the experience gained by the African Development Bank in the field of hydropower can play a relevant role at the time of developing new SHP in African countries.

160. The initial project term (four years) was clearly too short; the objective of having several SHP finished at the time of project completion (from feasibility studies to commissioning) is unrealistic (six or seven years would have been far more adequate). In fact, the only plant commissioned before the project termination was an enlargement of an already existing SHP (which is a much easier and shorter task than to build up an entirely new plant from the pre-feasibility study to final commissioning). Nevertheless, the project has succeeded in having several SHP under construction and with their financial requirements covered; consequently the final commissioning is a matter of time, and it can be reasonably expected that the example given will result in more SHP being commissioned in the next years (there are already some examples of this).

161. As for the size of the intended SHP, the assumption of an approximate size of 500 kW failed to take into consideration that the optimal use of a river basin is ahead of the determination of a plant size. In other words, if the basin as a whole is not taken into consideration, the construction of a plant in a certain site can either impede or make more expensive the optimal exploitation of the basin. But the project succeeded in accepting modifications of the plant sizes, and this attitude has undoubtedly resulted in a better use of the river basins and creation of a more profitable business (selling of surplus electricity) for the plant owners (tea factories).

162. The Evaluation Team has found some difficulties when carrying out its duties, due to scarcity of funding and time, which resulted in some sites not being visited, and lack of availability of some key project participants, already engaged in other projects or activities due to the long time elapsed from the project termination (end of October 2012) to Final Evaluation (July 2013).

Table 5. Project rating table and summary assessment

Criterion	***Summary Assessment***	***Rating by the Evaluator***	***Rating by the Evaluation Office***
A. Attainment of project objectives and results	Leaving apart the fact that only one of the six SHP was commissioned at the time of project termination (largely due to the short project duration)	Satisfactory (**S**)	S
1. Effectiveness	Success in implementing SHP to green the tea industry	Satisfactory (**S**)	S
2. Relevance	Project well designed and consistent with UNEP policies	Satisfactory (**S**)	S
3. Efficiency	Synergies with other projects (Nepal, Sri Lanka) adequately adopted. Good cost-effectiveness.	Satisfactory (**S**)	S

Criterion	*Summary Assessment*	*Rating by the Evaluator*	*Rating by the Evaluation Office*
B. Sustainability of project outcomes		Likely (**L**)	L
1. Financial	The project was able to mobilize finances from private sector and multilateral banks thus ensuring sustainability	Likely (**L**)	L
2. Socio-political	Growing degree of interest detected in many key stakeholders and energy authorities	Highly Likely (**HL**)	HL
3. Institutional framework	Project initiatives have resulted in discussions with energy authorities about wheeling and feed-in tariffs which will be eventually applied to other newcomers	Likely (**L**)	L
4. Environmental	Higher favourable environmental impacts, due to the increased plants capacities	Highly Likely (**HL**)	HL
C. Catalytic role	Before commissioning of the plants considered in the project, some tea factories are planning new SHP	Satisfactory (**S**)	S
D. Stakeholders involvement	Involvement of tea factories satisfactory, except in Uganda. Slow response of some energy authorities.	Moderately Satisfactory (**MS**)	MS
E. Country ownership / driven-ness	Positive general attitude of plant owners and energy authorities	Satisfactory (**S**)	S
F. Achievement of outputs and activities	The rating has considered that some of the outputs were not reachable along the defined project duration.	Satisfactory (**S**)	S
G. Preparation and readiness	Very detailed and high - quality Project Document, except plant size and project term.	Satisfactory **(S**)	S
H. Implementation approach	Positive reaction and attitude after a slow project start	Satisfactory (**S**)	S
I. Financial planning and management		Moderately Satisfactory (**MS**)	MS
J. Monitoring and	Monitoring carefully carried out. Insufficient planning	Moderately Satisfactory	MS

Criterion	*Summary Assessment*	*Rating by the Evaluator*	*Rating by the Evaluation Office*
Evaluation	and funds for evaluations.	(**MS**)	
1. M&E Design	Adequate, except for Evaluations	Moderately Satisfactory (**MS**)	MS
2. M&E Plan Implementation	Monitoring well carried out during the project	Satisfactory (**S**)	S
3. Budgeting and funding for M&E activities	Low and non - detailed budget for evaluations	Moderately Unsatisfactory (**MU**)	MU
K. UNEP and AfDB Supervision and backstopping	Continuous careful follow – up of the project by both UNEP and AfDB officials	Satisfactory (**S**)	S
1. UNEP	Careful supervision and help when difficulties arose.	Satisfactory (**S**)	S
2. AfDB	AfDB played just a catalytic role to get other financial entities involved in the project	Moderately unsatisfactory (**MU**)	MU
OVERALL RATING		**Satisfactory (S)**	**S**

Lessons Learned

163. One relevant success of the project has been, firstly, to select an industrial sector (tea industry in this case) in which "synergies" with the project activities exist (tea grows in hilly and rainy areas, where potential for hydropower development also exists) and then to involve the considered industrial sector in a completely new type of activity, almost unknown up to then: the generation of electricity from small hydropower plants (in the present case). In this sense, it was a very appropriate approach to carry out a detailed study of the considered industrial activity, its present situation in African countries, historic data, future perspectives, necessities of energy, consumption of electricity, sources from which this electricity is obtained, quality of electricity supplied from the networks, etc. Another important aspect was to consider a sector with some possibilities at the time of facing investments.

164. The general project approach (selection of a sector with a potential interest in electrification, detailed analysis of its present situation and necessities, involvement of a representative

institution, etc.) described in the previous paragraphs, is generally adequate and it is therefore in general terms recommended to use the same or similar approach to future projects of electrification. The **first lesson** is therefore the adequacy of selecting a sector (tea industry) whose characteristics (hilly and rainy areas, necessity of good supply of electricity, availability of financial resources) make it an adequate partner for the project. From the viewpoint of country electrification, the final effect of GTIEA is to have a number of SHP commissioned; clearly the fact that a relevant industrial sector (tea industry) has been heavily involved has made things much easier when compared to the mere promotion of the same SHP. Future electrification projects should involve (whenever possible) a relevant industrial stakeholder whose electricity supply difficulties can be solved through use of the technologies contemplated in the Project.

165. A second success was to adopt an organization with a very good knowledge of the industry and good contacts in all the considered countries (EATTA) as the project Executing Agency (having previously created interest on SHP among the members of EATTA Board of Directors). For this purpose, dissemination activities and knowledge of similar activities carried out in other countries (Nepal, Sri Lanka) played undoubtedly a relevant role at the time of planting interest in the future project activities. The **second lesson** is the convenience of involving in the project an institution with good knowledge, influence and contacts in the considered sector. In future projects, this institution must accept responsibilities, as EATTA did in the GTIEA project. In other words, acceptance of first lesson should involve (whenever possible) the implication of a relevant institution of the sector, instead of just individual companies.

166. The Project Document contains a detailed analysis of the tea industry in the considered African countries, together with many relevant data about its demand for energy and the quality of electricity supply received, including blackouts, use of auxiliary gensets, etc. It is reasonable to define the electricity demand for a standard tea factory, but it is not adequate to define capacity of the SHP to be constructed according only to this reasoning, without an analysis (at least preliminary) of the characteristics of each site, since this can put a burden on the optimal use of an entire river basin. It can be argued that this is not a solid argument when trying to convince the Board of Directors of an industrial activity to invest in a field that is completely (or almost completely) unknown to them, but the energy authorities of the country also play a relevant role (especially if it is foreseen to supply electricity to other factories, or to sell surplus production directly to other users, or to the country network). Therefore, a **third lesson**, applicable only to future hydroelectric projects, is the importance of considering an optimal exploitation of the entire river basin before selecting the construction sites, having in mind not only the specific needs of the beneficiaries.

167. It is therefore recommended to carry out, whenever possible, a preliminary study of possible sites considering the entire river basin and not focusing only on a specific site, at least using available hydrological information (if the new project refers to hydro plants).

168. It was also a good idea to involve the African Development Bank (AfDB) as a stakeholder in the project; independently of whether this institution provides direct financing for this type of projects or not, it is clear that the presence of an institution of this type plays a role as an agglutinant or positive reference to other donors/financing institutions for participation in

project activities; in the same way, it is undoubtedly positive to improve the degree of knowledge of the AfDB in the field of hydropower if the project activities have to be replicated in the future. The **fourth lesson** is the convenience of paying much attention to the financing issues from the very beginning of the project; experience has repeatedly shown that many projects cannot be carried out due to lack of financial resources. It must be emphasized that one thing is to be a donor (to have a given amount and modality to lend ab initio) and a different one is to finance projects; in this case it is necessary to create the potential borrower first before constructing how and how much to lend. To create the potential borrowers, and once in place, to determine how much they were to go for and from whom is a long process; this is another argument for the project having had an implementation timeframe longer than four years.

169. Although it is certainly site – dependent, a **fifth lesson** derived from GTIEA experiences is that, if a certain project has as one of its objectives the complete construction of a SHP, from pre-feasibility study to commissioning, the project duration has to be defined accordingly (six – seven years). Nevertheless it is worth to mention that a project after whose termination one (or several) SHP are already under construction, with financial issues solved and adequate manpowered, can by no means be considered unsuccessful; it is clear that in the next few years six of the considered GTIEA SHP will be commissioned (the only exception being Nchwera, in Uganda).

170. The **sixth lesson** is that the project key personnel must be made available to the Final Evaluation Team for interviews, data collection, etc. Given that final evaluations sometimes take place relatively long after project termination, this availability should be specified in the contractual obligations of the referred personnel. In the same way, the project should devote sufficient funds to carry out detailed evaluations, including visits to all the relevant project sites.

171. Last but not least, the dissemination efforts and the initiatives taken to improve technical abilities of manpower will have a positive and durable effect over the development of hydropower resources in the GTIEA countries and elsewhere. Therefore, the **seventh lesson** for future projects is the need to pay adequate attention to improve abilities of working personnel and to create qualified manpower. In fact, potential for replication of projects can only be guaranteed when adequately qualified manpower exists.

Recommendations

172. Recommendation 1. The first recommendation is to follow up the developments of plants already under construction (Gura and Giciye). The Executing Agency should carry out this task, in collaboration with UNEP; UNEP should continue monitoring progress on the construction of SHP, paying attention to the operation and maintenance of the plants. Whenever possible, for example periodical reports (quarterly) should be prepared indicating the project developments, problems encountered, solutions adopted, etc., and made available to UNEP. Given the level of contacts between the Executing Agency and the tea factories, this task should not imply major difficulties.

173. Recommendation 2. The Executing Agency should follow up with the developments of plants whose construction has been decided but not yet commenced: in this case a careful follow up is especially important until the construction works start; (monthly reports indicating the development status, evolution of licensing procedures, expropriations, availability of financing, and any other issue which can influence the construction start-up. Later, once the plants are under construction, the Executing Agency, in collaboration with UNEP should continue monitoring progress of the construction of SHP, paying specific attention to the operation and maintenance of the plants.

174. Recommendation 3. The GTIEA project long term impact can only be guaranteed if the plants are adequately operated and maintained. It is therefore strongly recommended that UNEP takes the necessary measures to get information about operation and maintenance of the plants. The Executing Agency is the most adequate body to carry out this task, since its existence goes beyond the project termination; the first task is to get information about how the owners of the plants are dealing with the operation and maintenance issues (hired qualified personnel, sub- contracting (perhaps with one of the country generation utilities) etc.) Later, a yearly operation and maintenance report should be prepared by the owners and submitted to UNEP; in this way UNEP will be in a position to follow up the long term impact of the project, to estimate the level emissions that have been avoided, etc.

ANNEXES

Annex 1. Evaluation TORs

Annex 2. Evaluation program

Annex 3. Bibliography

Annex 4. Summary of co-finance information and a statement of project expenditure by activity

Annex 5. Details of the project's 'impact pathways' and the 'ROtI' analysis

Annex 6. Technical working papers

Annex 7. Evaluation questions and indicators

Annex 8. Brief CVs of the consultants

Annex 1. Evaluation ToR

TERMS OF REFERENCE

Terminal Evaluation of the UNEP/GEF project on "Greening the Tea Industry in East Africa"

PROJECT BACKGROUND AND OVERVIEW

Project General Information

Table 6. Project summary

GEF project ID:	2683	**IMIS number:**	GFL-2328-2721-4981
Focal Area(s):	Climate Change	**GEF OP #:**	OP 5 & OP 6
GEF Strategic Priority/Objective:	SP 2, SP 3, SP 4	**GEF approval date:**	18 June 2007
UNEP approval date:	31 July 2007	**First Disbursement:**	14 August 2007
Actual start date:	September 2007	**Planned duration:**	63 months
Intended completion date:	October 2011	**Actual or Expected completion date:**	31 October 2012
Project Type:	FSP	**GEF Allocation:**	$ 2,854,000.00
PDF GEF cost:	$ 569,400.00	**PDF co-financing*:**	$13,000
Expected MSP/FSP Co-financing:	$ 25,878,766.00	**Total Cost:**	$29,491,166.00
Mid-term review/eval. (planned date):	1-31 Jan 2009	**Terminal Evaluation (actual date):**	
Mid-term review/eval. (actual date):	1-31 Aug 2009	**No. of revisions:**	3
Date of last Steering Committee meeting:	17 July 2012	**Date of last Revision:**	03 March 2012
Disbursement as of 31 December :	2,755,516.01	**Date of financial closure:**	December 2012
Date of Completion:	October 2012	**Actual expenditures reported as of 31 December:**	2,755,516.01
Total co-financing realized as of 31 December:	16,593,173	**Actual expenditures entered in IMIS as of 31 December:**	2,755,516.01
Leveraged financing:	Not reported		

Project Background

Project Rationale

1 Many Eastern and Southern African countries (Ethiopia, Burundi, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe) produce tea in bulk for export, generating crucial foreign earnings. Foreign earnings are the ultimate productive use of energy allowing tea communities to become economically strong. The basic processing of tealeaves undertaken at the tea factories requires significant amounts of electrical energy. Currently, in most factories the electrical energy is sourced from, often unreliable, national grids or inefficient and highly polluting and greenhouse gas emitting diesel generation (gensets). Since the tea areas are often in remote areas and voltage on the grid may fluctuate causing damage to equipment even preventing the use of some voltage sensitive equipment like compact fluorescent lights. Drought prone countries including most of these have had drought induced power rationing in recent years. Most of these countries have inefficient transmission and distribution systems, high demand and low generation capacities resulting in frequent load shedding. All tea factories have generator sets that are on average in operation for up to 5 % of (factory operation) time, while some rely exclusively on captive power gensets. The fuel budgets of tea factories are dependent on increasing international oil prices with negative implications on the competitiveness of the tea produce at the world market.

2 It appears that wherever tea is grown, the rainfall and hilly terrain guarantee that there will be a hydropower potential somewhere near the tea processing plant. In some cases this potential is already used, but in most cases the tea manufacturers rely on the grid and some diesel gensets for back up purposes. Since few tea factories have taken up small hydropower, this project was envisioned to systematically remove barriers regionally.

3 The idea behind the UNEP/GEF project *Greening the Tea Industry in East Africa* was that through a number of (pre-) feasibility studies, a number of pilot mini-hydro projects would be developed, preferably with a rural community electrification component. The project aimed to improve the security of energy supply for the tea factories and to lower tea production costs by reducing dependency on fossil fuels by shifting the focus from grid power to hydropower generated in close proximity to the tea factories. In addition, the project aimed to accelerate the shift from grid and diesel gensets to hydropower through the creation of special financing window for tea manufacturers. Specifically, the project aimed to: 1) facilitate generation of electricity from decentralized hydropower; and 2) to improve the reliability and quality of energy service to the tea factories and hence lower factory production costs while providing access of electricity to households and public and community facilities within close proximity to the tea factories. The project was envisaged to benefit the power utilities through grid reinforcement and reduction of fossil fuel generated electricity in the main grid. The concept is to blend a commercial activity (tea processing) and its energy requirements with the social and developmental dimension of rural electrification (and possible corporate responsibility). The project was also envisaged to deliver global environmental benefits through reducing Greenhouse Gas (GHG) emissions and contributing to poverty alleviation through increased employment.

4 All stages of the project development (pre-feasibility, feasibility including detailed design, tendering, actual construction and commissioning, operation and maintenance) were designed to form a solid training ground for tea sector engineers as well as for civil engineers from national consulting and engineering firms. The purpose of the hands-on training was to build sufficient technical capacity enabling the realization of future mini-hydro systems tapping local expertise.

5 As the project was not be limited to technical and legal assistance in the planning and design of small hydro facilities in East Africa but also covered the actual realization of Hydro (including a crucial project finance component) the GEF Secretariat recommended UNEP to co-implement the project with the African Development Bank (AfDB) in order to ensure that the resulting project documents (feasibility studies, etc.) are indeed bankable and will lead to actual investments.

6 In addition, the GEF Secretariat was aware of the large variety in each of the East African Tea Trade Association (EATTA) member states in terms of number of tea factories and yearly tea production as well as the difference in economic conditions and legal issues (prospects for small power production, tariffs for

kWh sales to the grid, etc.). In its project approval GEF Secretariat suggested a geographical spread of pilot projects in order to introduce hydro based power generation by tea factories not only in the country with the best prospects but also in (at least) some of the other EATTA participating nations. Following the suggestion, the project was implemented in Burundi, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. As only one GTIEA initiated hydro project was completed within the pre-set project time frame of four years and a number of projects about to start, the GTIEA project was extended (budget neutral) with one extra year and was finally closed last October 2012.

7 The *Greening the tea industry* – project has close linkages with the UNEP-RISOE's *Poverty alleviation through clean energy from agro-industries in Africa (PACEAA)* – project. The PACEAA – project is supported by the European Commission's (EC) COOPENER programme, and is helping to develop tools, policies and business infrastructure to make affordable and sustainable electricity available to rural populations. The start of the three-year PACEAA programme was timed so that it would run alongside and be coordinated with two larger Global Environment Facility (GEF) initiatives: namely the *Greening the Tea Industry in East Africa* and *Cogen for Africa*, executed by AFREPREN/FWD, which is also concerned with the generation of clean, stable electricity for rural agro-industries. PACEAA, however, has a different focus: the aim is to build a framework to support a system where surplus hydropower over and above factories' needs could be used to serve local communities. The project is designed to help remove policy, commercial and regulatory barriers to use of this energy by local populations and to propose financial incentives that encourage the involvement of agro-industries and other stakeholders in rural electrification using clean energy. For full details, visit: www.paceaa.org.

Project objectives and components

8 The objective of the proposed Mini Hydro Program was to promote investment in small hydro power through a reduction of the electrical energy costs in the tea processing industries in countries covered by the East African Tea Trade Association and meanwhile increasing power supply for rural electrification and power reliability as well as reducing greenhouse gas emissions through removal of barriers related to financial weaknesses, lack of technical awareness and capacity as well as all obstacles related to power sector policy frameworks.

9 The original project document approved in March 2005 stated the project's s objectives, outcomes and outputs, as well as targets for greenhouse gas emission reduction as follows:

10 *Specific Objectives:*

1) To provide financial and technical assistance that facilitates the switch from grid-based electricity as main power source to Mini Hydro as locally available alternative;
2) To facilitate access to electrical power for communities adjacent to tea factories and/or Mini Hydro Plants.

11 *Outcomes:*

1) A specific project-oriented financing scheme that encourages mini-hydro development in East Africa is created;
2) Mini hydro projects for tea processing industry in EATTA countries developed and implemented;
3) Technical capabilities concerning design, operation and maintenance of mini-hydro electrical power systems enhanced within the tea sector and civil engineering sector of each participating country;

4) Quality standards for mini hydro design, installation and maintenance and operation have been set for all EATTA countries;

5) Awareness on potential for (mini) hydro as technically viable, economically feasible and environmentally friendly alternative to current (conventional) practices has been raised;

6) A regulatory framework for power generation and distribution of (mini-hydro) power has been established in all participating EATTA countries (water rights, generation and distribution licenses and tariffs);

7) Households, commercial and social establishments in un-electrified communities near tea processing plants have been connected to the plants' mini hydropower supply;

8) Regional increase in local manufacturing of mini-hydro system components;

9) One or more models for electric service provision to tea factories (and communities- if relevant) are established;

10) Communities aware of the value of well-preserved watershed catchment areas upstream.

12 *Specific Outputs:*

1) 6 Mini hydro demonstration projects established in at least 3 EATTA member countries; preferably with an attached rural-electrification component;

2) Partnership between EATTA and UNEP has been established (MOU);

3) Up to 5 extra pre-feasibility studies for promising mini-hydro sites have been prepared;

4) Project financing mechanism established (dedicated financing window for project development including incentives);

5) EATTA project facilitation skills enhanced & project implementation committee operational;

13 *Green House Gas Emission Reduction targets:*

14 At the preliminary stage it was assumed that on average 500 kW per tea factory should be installed to meet power requirements of the tea factory and of nearby communities.

15 For 6 demo-projects: 6 x 500 kW (rate capacity) x 0.6 (assumed load factor, taking non-productive nights, low community loads into consideration) x 24 hrs/day x 365 days/annum = 15,768 MWH/annum. Assuming this 6 x 500 kW will now or in the near future replace diesel powered electricity generation, using IPCC emission factor for diesel of 1,019 ton CO2 MWH this would result in a mitigation of some 16,000 tons of CO2. There are all together 150 tea factories in the EATTA region. Should it be possible to develop hydropower installations at a modest 50 tea processing plants of each 500 kW, CO2 emission reductions would amount to 130,000 ton.

16 In some case the hydro potential might be substantially larger than the demand of the tea factory. Pre-feasibility study results for a cluster of tea processing plants in the Aberdares (Kenya) indicate that there might even be more than sufficient power not only to meet power requirements of tea factory and community. In that case, it may even be considered to use (excess) electricity for thermal purposes (tea leave drying), thus substituting furnace oil or wood fuel.

Project area and main stakeholders

17 The project is vested under the GEF focal area of Climate Change and the operational program OP6 – "Promoting the adoption of renewable energy by removing barriers and reducing implementation costs. The project responds to GEF strategic priority SP3 "Power sector policy framework supporting of renewable energy and energy efficiency" and is relevant to the SP1 "Transformation of Markets for high value products and processes".

18 The project document identified as main stakeholders the government officials involved in the regulation of the power sector and formulation of power sector policies: financial institutions including development and commercial banks; small hydropower industry, including consultancy firms, engineering, construction and contracting firms, and equipment manufacturers; the EATTA; and the tea factories as well as the communities living in their vicinity without electricity. The importance of stakeholder involvement was especially emphasized during the PDF-B Project preparation phase, when the main stakeholders were engaged in a series of meetings and workshops. At the project preparatory phase, consultations were held with the EATTA - the project executing agency - to seek for feedback for the project plan. Individual tea companies were also given an opportunity to present their views and ask questions on the project design.

Executing Arrangements

19 The project was implemented by UNEP/GEF and executed by the East African Tea Trade Association (EATTA), which is an umbrella organization engaging in the entire Tea Sector in all of the project pilot countries. The EATTA was to provide direct linkages to all its members in the tea processing sector, to liaise with government agencies and utility companies through national tea sector associations, to ensure continued data collection and to facilitate workshops. UNEP as the implementing agency was responsible for overall project supervision, to ensure consistency with GEF and UNEP policies and procedures and was expected to join the project SC and to liaise between the Project Management Office and the GEFSEC.

20 The East Africa Tea Trade Association is based in the port of Mombasa, Kenya and operates the tea auction of Mombasa for all East African tea and liaises with various National Authorities on behalf of its members. Members of EATTA are located in all countries that produce tea in the region: Burundi, Kenya, Malawi, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. In some cases individual tea manufacturers are EATTA members, in other cases entire groups or associations are registered as single members. Prior to this project, the EATTA has not been engaged in any projects that bear similarity with the proposed *Greening the Tea Industry in East Africa*. The implementing agencies - UNEP and the AfDB - collaborated with the EATTA (as Executing Agency) in the realization of the project to be evaluated.

21 The EATTA hosted a Project Management Office, in which international and national experts worked on the defined tasks to create an enabling environment for mini-hydro development in tea factories, to promote rural electrification, to design and conduct hydropower pre-feasibility and feasibility studies, training of technical staff in the civil engineering and electrical engineering sectors, including technical staff at the tea factories, and to liaise with the Ministry of Energy, Ministry of Industry and other relevant ministries and national entities. After the PDF-B a number of tea factories were invited for the actual implementation of the mini hydropower plant demonstration projects. These demonstration projects served as the direct linkages between the EATTA Project Management Office and the individual tea factories.

22 The Project Steering Committee (PSC), chaired by the EATTA, was to provide the primary governance structure for the project. The PSC was to consist of EATTA representatives (Board Members), Senior Government Officials (Ministries of Energy) and a representative of the Implementing Agency (UNEP). National Steering Committees (NTSC's) were to be constituted in member states where actual demonstration projects were developed (i.e. Kenya, Uganda, Tanzania, Malawi) consisting of the tea processing sectors (e.g. Tea Board / Association) and the Government (e.g. Ministry of agriculture.

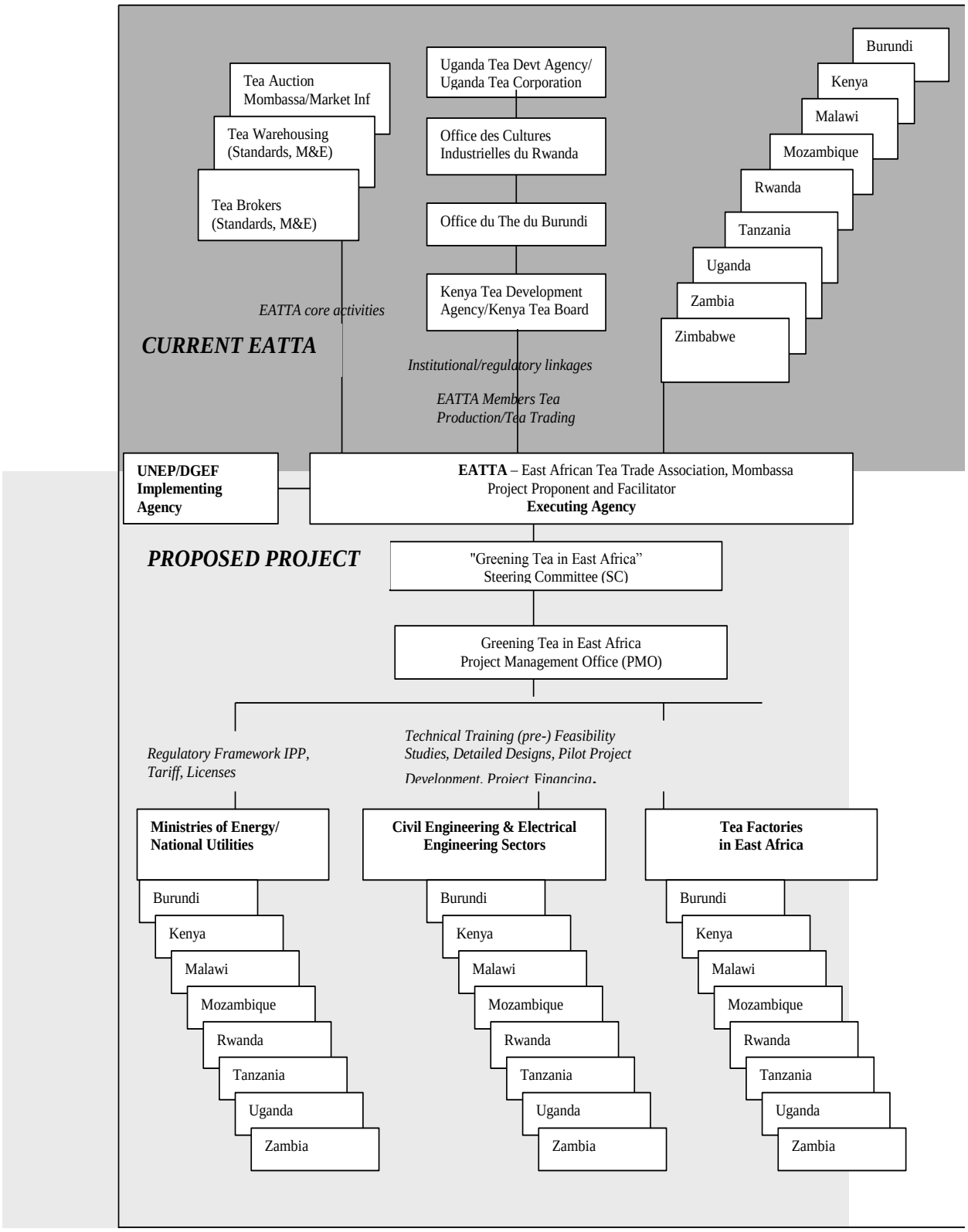


Figure 2: Organization structure of the project stakeholders and key sectors

Project Cost and Financing

23 The project aimed to realize six mini hydro projects as demonstration projects for tea factories, with a complementary rural electrification scheme. Duration of the project was initially set at 4 years.

24 The funding from the Global Environment Facility (GEF) with co-financing support from the EATTA, participating country governments and other donors was to remove the major barriers to attracting small hydro investments in the tea sector. Investment in the pilot hydropower projects was envisaged to be commercial and to come from financial institutions and the tea factories themselves. The project plan recognized that sources of finance would vary with the nature of the project: a power supply exclusively for the tea factory may have a relatively high profitability and financing would be the main responsibility of the tea factory itself. Should however power be generated for rural electrification purposes, the profitability might be substantially lower while other social and commercial development interests would be served. Rural electrification (through possible private/public partnerships) were of great interest to the EUEI (European Union Energy Initiative for Poverty Alleviation and Sustainable Development) and resulted in an associated RE component.

Table 7. Project costs (million US$)

Component	Indicative Cost Total M USD	Private Sector (Tea Industry & EATTA) M USD	Utility/ ESCO M USD	GEF M USD	Other Donors M USD
Project Management office, operational cost, 4 years	2.00	0.10	0	1.00	0.90
Feasibility studies, surveys (topo, soil, etc.), detailed design for 6 mini hydropower plants 500 kW each @ USD 500/kW	1.50	0.50	0	0.50	0.50
Construction 6 mini hydropower plants 500 kW each @ USD 2,500/kW for civil works, electromechanical equipment & installation	7.50	6.00	0	0	1.50
Local distribution network – grid connected or independent (arbitrarily estimated at USD 250,000 per site)	1.50		1.00		0.50
Additional 6 pre-feasibility studies @ USD 20,000	0.12	0.05	0	0.07	0
Hands-on training & training course during pre-feasibility, survey, design and construction phase for tea sector engineers, civil engineers in all EATTA countries 7 x USD 100,000	0.70	0.10	0	0.40	0.20
TOTALS	**13.32**	**6.75**	**1.00**	**1.97**	**3.60**

Table8. Project co-financing

Name of Co-financiers (source)	Classification	Type	At Concept ($)	At Work Program ($)	At CEO Endorsement ($)
Co-financing for Technical Assistance					
National Governments	Nat'l Gov't	In kind		2,680,000	2,680,000

AfDB, COOPENER/EC, Proinvest, REEEP, Triodos	Others	AfDB ($224,640-In kind) COOPENER ($418,600-In cash) Proinvest ($130,000-In cash)		614,000	773,240
EATTA Co-finance	Exec. Agency	In kind		100,000	109,526
EATTA Co-finance	Exec. Agency	In cash		-	96,000a
Construction & Equipment Companies	Other	In kind		220,000	220,000
Leveraged Investment Financing (Tea Factories/Utilities and Banks)					
Tea Factories/ Utilities (equity)	Other	In cash		7,000,000	7,000,000
Private sector (Banks)	Private Sector	In cash		15,000,000	15,000,000
Total Co-financing				**25,614,000**	**25,878,766**

Project Implementation Issues

25 The four year project implementation period prescribed by GEF Secretariat proved to be too short as unforeseen delays occurred; some staff were not available when the project was commenced and a change in top management took away some of the short time available. Often weather statistics and the anticipated sets of river flow data were incomplete and at some sites this resulted in the installation of gauges to obtain at least one set of one year river flow data. Naturally, waiting for the collection of reliable data resulted in project delays. In addition, as mentioned already, the realized size of the power projects was in most cases much larger than originally planned (500 kW on average) and in some cases resulted in systems that were ten times the envisaged size. This created a need to develop more and larger-sized designs, and consequently, more design work required more time. Moreover, in one particular case the local engineering firm (unexpectedly) lacked capacity in Computer Aided Design (AutoCad) as all the local existing expertise was in the field of road design but not in canal design and drawings. Ultimately a well-trained AutoCad hydro expert from Nepal was flown into Nairobi. In all cases the feasibility studies including designs took much longer (more than 1 year extra) than originally anticipated.

26 Because of the delays, the project was (budget neutrally) extended with an extra year, with a number of projects still under construction. With the project closure in October 2012 items that were originally planned as activities in the GTIEA project (e.g. commissioning as well as operation and maintenance issues) could no longer be covered.

TERMS OF REFERENCE FOR THE EVALUATION

1.1. Objective and Scope of the Evaluation

27 In line with the UNEP Evaluation Policy[1], the UNEP Evaluation Manual[2] and the Guidelines for GEF Agencies in Conducting Terminal Evaluations[3], the terminal evaluation of the Project "**Greening the Tea Industry in East Africa**" is undertaken one year after completion of the project to assess project performance (in terms of relevance, effectiveness and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. The evaluation has two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, the GEF and their partners. Therefore, the evaluation will identify lessons of operational relevance for future project formulation and implementation. It will focus on the following sets of **key questions**, based on the project's intended outcomes, which may be expanded by the consultants as deemed appropriate:

1) The project was supposed to blend a commercial activity (low cost power generation for the tea sector) with socio-economic development of nearby areas (rural electrification). Was this achieved? What was the projects' impact on rural electrification and possible other local socio-economic development (e.g. road construction) and in how far has the PACEAA project contributed?

2) Did the project realize the number of envisioned small hydro plants? When and where and with what capacity? How many are still under construction and how many projects are now at design/feasibility study stage as a (direct/indirect) result of the project? What are the main reasons that the actual capacities differ so much from the planned average of 500 kW/tea factory? What was the effect on predicted GHG emission reductions?

3) Was the combination of UNEP and AfDB as "Implementing Agencies" for this particular project an effective combination that was instrumental in achieving the projects results? Was the EATTA a good choice of project partner as the "Executing Agency"?

4) What was the effect of the introduction of small hydro on the kWh cost price and the quality of electric power service (availability, frequency, voltage) for the various participating tea companies, and what is the (projected) impact on the financial performance of these companies?

5) What kind of obstacles did the realization of small hydro power plants face in the various East African countries during the stage of pre-feasibility, feasibility and project financing stage and how were these resolved?

6) In terms of capacity building: what has GTIEA achieved in the various participating countries during the various stages of mini hydro power project development (design, feasibility study, financing, local manufacturing, construction)? Was it indeed a training ground for local engineers/technicians of the tea sector and regional consulting firms?

7) In which countries and in what way (regulatory framework, legal aspects, and banking) did the GTIEA facilitate the development of future mini hydro projects?

8) How is the GTIEA project sustained after closure in the various countries and with the EATTA as umbrella organization?

Overall Approach and Methods

[1] http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationPolicy/tabid/3050/language/en-US/Default.aspx
[2] http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationManual/tabid/2314/language/en-US/Default.aspx
[3] http://www.thegef.org/gef/sites/thegef.org/files/documents/TE_guidelines7-31.pdf

28 The Terminal Evaluation (TE) of the Project "*Greening the Tea Industry in East Africa*" will be conducted by a team of two independent consultants under the overall responsibility and management of the UNEP Evaluation Office (Nairobi), in consultation with the UNEP/DTIE GEF Coordination Office (Nairobi), and the UNEP Task Manager at UNEP/DTIE.

29 The TE will be an in-depth evaluation using a participatory approach whereby key stakeholders are kept informed and consulted throughout the evaluation process. Both quantitative and qualitative evaluation methods will be used to determine project achievements against the expected outputs, outcomes and impacts.

30 The findings of the evaluation will be based on the following:

31 A **desk review** of project documents and others[4] including, but not limited to:

- Relevant background documentation, *inter alia* UNEP and GEF policies, strategies and programmes pertaining to sustainable transport;
- Project design documents; annual work plans and budgets or equivalent, revisions to the logical framework and project financing;
- Project reports such as progress and financial reports from the executing partners to the Project Management Unit (PMU) and from the PMU to UNEP; project and national Steering Committee meeting minutes; annual Project Implementation Reviews, the project mid-term evaluation, and relevant correspondence;
- Documentation related to project outputs;
- Documentation available on the project website: http://greeningtea.unep.org/.

32 **Interviews**[5] with:

- Project management and execution support at UNEP at the PMU and Secretariat of the East African Tea Trade Association (EATTA-Mombasa);
- UNEP Task Manager and Fund Management Officer (Nairobi);
- EATTA country representatives in Tanzania, Uganda, Malawi, Rwanda;
- Relevant staff of GEF Secretariat;
- Representatives of the project and national steering committees;
- Representatives of the involved tea factories and related communities;
- Representatives of other multilateral agencies and other relevant organisations.

33 **Country visits.** The countries and locations to be visited have been selected by the UNEP Evaluation Office, in collaboration with the Implementing Agency, giving due consideration to budget and time factors as well as the need for an adequate and representative sample to support the findings of the evaluation. The evaluator(s) will visit the UNEP Evaluation Office and the project Task and Fund Management Officers in Nairobi and the East African Tea Trade Association in Mombasa. The consultants will meet project stakeholders in Kenya, Uganda, Rwanda and Tanzania and visit demonstration projects of Tagabi in western Kenya and Gura and North Mathioya in central Kenya; Nchwera in the Bushenyi district of Western Uganda; Giciye in North-West Rwanda; and Suma in Mbeya, Western Tanzania.

Key Evaluation principles

[4] Documents to be provided by the UNEP Task Manager are listed in Annex 5. Many documents are available on the project website http://greeningtea.unep.org

[5] Face-to-face or through any other appropriate means of communication

34 Evaluation findings and judgements should be based on **sound evidence and analysis**, clearly documented in the evaluation report. Information will be triangulated (i.e. verified from different sources) to the extent possible, and when verification was not possible, the single source will be mentioned[6]. Analysis leading to evaluative judgements should always be clearly spelled out.

35 The evaluation will assess the project with respect to **a minimum set of evaluation criteria** grouped in four categories: (1) Attainment of objectives and planned results, which comprises the assessment of outputs achieved, relevance, effectiveness and efficiency and the review of outcomes towards impacts; (2) Sustainability and catalytic role, which focuses on financial, socio-political, institutional and ecological factors conditioning sustainability of project outcomes, and also assesses efforts and achievements in terms of replication and up-scaling of project lessons and good practices; (3) Processes affecting attainment of project results, which covers project preparation and readiness, implementation approach and management, stakeholder participation and public awareness, country ownership/driven-ness, project finance, UNEP supervision and backstopping, and project monitoring and evaluation systems; and (4) Complementarity with the UNEP. The lead consultant can propose other evaluation criteria as deemed appropriate.

36 **Ratings**. All evaluation criteria will be rated on a six-point scale. However, complementarity of the project with the UNEP strategies and programmes is not rated. Annex 2 provides detailed guidance on how the different criteria should be rated and how ratings should be aggregated for the different evaluation criterion categories.

37 In attempting to attribute any outcomes and impacts to the project, the evaluators should consider the difference between **what has happened with** and **what would have happened without** the project. This implies that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. This also means that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project. Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluators, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

38 As this is a terminal evaluation, particular attention should be given to learning from the experience. Therefore, **the "why?" question** should be at front of the consultants' minds all through the evaluation exercise. This means that the consultants need to go beyond the assessment of "what" the project performance was, and make a serious effort to provide a deeper understanding of "why" the performance was as it was, i.e. of processes affecting attainment of project results (criteria under category 3). This should provide the basis for the lessons that can be drawn from the project. In fact, the usefulness of the evaluation will be determined to a large extent by the capacity of the consultants to explain "why things happened" as they happened and are likely to evolve in this or that direction, which goes well beyond the mere assessment of "where things stand" today.

Evaluation criteria

Attainment of Objectives and Planned Results

39 The evaluation should assess the relevance of the project's objectives and the extent to which these were effectively and efficiently achieved or are expected to be achieved.

a) *Achievement of Outputs and Activities:* Assess, for each component, the project's success in producing the programmed outputs, both in quantity and quality, as well as their usefulness and timeliness. Briefly explain the degree of success of the project in achieving its different outputs, cross-referencing as needed to more detailed explanations provided under Section 3 (which covers the processes affecting attainment of project objectives).

b) *Relevance*: Assess, in retrospect, whether the project's objectives and implementation strategies were consistent with the UNEP mandate and policies at the time of design and implementation; and the GEF Climate Change focal area, strategic priorities and the relevant operational program(s).

[6] Individuals should not be mentioned by name if anonymity needs to be preserved.

c) *Effectiveness*: Assess to what extent the project has achieved its **immediate objective** "to green the tea industry in the East African Region" and its component outcomes. To measure achievement, use as much as appropriate the indicators for achievement in the Logical Framework Matrix (Logframe) of the project of the latest PIR (FY 2012), adding other relevant indicators as appropriate. Briefly explain what factors affected the project's success in achieving its objectives, cross-referencing as needed to more detailed explanations provided under Section 3.

d) *Efficiency*: Assess the cost-effectiveness and timeliness of project execution. Describe any cost- or time-saving measures put in place in attempting to bring the project to a successful conclusion within its programmed budget and (extended) time. Wherever possible, compare the cost and time over results ratios of the project with that of other similar projects. Give special attention to efforts by the project teams to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency.

e) *Review of Outcomes to Impacts (ROtI)*: Reconstruct the logical pathways from project outputs over achieved objectives towards impacts, taking into account performance and impact drivers, assumptions and the roles and capacities of key actors and stakeholders, using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook[7] (summarized in Annex 6 of the TORs). Assess to what extent the project has to date contributed, and is likely in the future to further contribute to changes in stakeholder behaviour as regards: i) Awareness and understanding of the benefits of renewable energy project implementation among politicians, decision makers and tea factory owners of the East African region, resulting in ii) the actual implementation of new hydro and/or renewable energy projects in the various countries of the region. Estimate how these projects would lead to environmental benefits such as reduced GHG emissions.

Sustainability and catalytic role

40 **Sustainability** is understood as the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The evaluation will identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of benefits. Some of these factors might be direct results of the project while others will include contextual circumstances or developments that are not under control of the project but that may condition sustainability of benefits. The evaluation should ascertain to what extent follow-up work has been initiated and how project results will be sustained and enhanced over time. Application of the ROtI method will assist in the evaluation of sustainability.

41 Four aspects of sustainability will be addressed:

(a) *Socio-political sustainability.* Are there any social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Is the level of ownership by the main national and regional stakeholders sufficient to allow for the project results to be sustained? Are there sufficient government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project? What is the project doing to ensure this socio-political sustainability of results and benefits?

(b) *Financial resources.* To what extent are the continuation of project results and the eventual impact of the project dependent on continued financial support? What is the likelihood that adequate financial resources[8] will be or will become available to implement the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project? Are

[7] http://www.thegef.org/gef/sites/thegef.org/files/documents/Impact_Eval-Review_of_Outcomes_to_Impacts-RotI_handbook.pdf

[8] Those resources can be from multiple sources, such as the public and private sectors, income generating activities, other development projects etc.

there any financial risks that may jeopardize sustenance of project results and onward progress towards impact? What concrete efforts is the project making to ensure financial sustainability of results and benefits?

(c) *Institutional framework.* To what extent is the sustenance of the results and onward progress towards impact dependent on issues relating to institutional frameworks and governance? How robust is/are governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustaining project results and to lead those to impact on human behaviour and environmental resources? How is the project contributing to the sustainability of these institutional achievements?

(d) *Environmental sustainability.* Are there any environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits? How is the project dealing with these?

42 **Catalytic Role and Replication**. The *catalytic role* of GEF-funded interventions is embodied in their approach of supporting the creation of an enabling environment and of investing in pilot activities which are innovative and showing how new approaches can work. UNEP and the GEF also aim to support activities that upscale new approaches to a national, regional or global level, with a view to achieve sustainable global environmental benefits. The evaluation will assess the catalytic role played by this project, namely to what extent the project has:

(a) *Catalysed behavioural changes* in terms of use and application by the relevant stakeholders of: i) technologies and approaches show-cased by the demonstration projects; ii) strategic programmes and plans developed; and iii) assessment, monitoring and management systems established at a national and sub-regional level;

(b) Provided *incentives* (social, economic, market based, competencies etc.) to contribute to catalysing changes in stakeholder behaviour;

(c) Contributed to *institutional changes.* An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in the regional and national demonstration projects;

(d) Contributed to *policy changes* (on paper and in implementation of policy);

(e) Contributed to sustained follow-on financing (*catalytic financing*) from Governments, the GEF or other donors;

(f) Created opportunities for particular individuals or institutions ("*champions*") to catalyse change (without which the project would not have achieved all of its results).

43 *Replication*, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated (experiences are repeated and lessons applied in different geographic areas) or scaled up (experiences are repeated and lessons applied in the same geographic area but on a much larger scale and funded by other sources). The evaluation will assess the approach adopted by the project to promote replication effects and assess to what extent actual replication has already occurred or is likely to occur in the near future. In this particular case, the evaluation will assess the efforts made by the project to disseminate achievements and lessons learned in the realization of mini hydro in East Africa whether there is any evidence of replication in other commercial sectors or (utility based?) rural electrification in the wider region, of project results and good practices. What are the factors that may influence replication and scaling up of project experiences and lessons?

44 In addition, specific to this project, the consultant(s) should address the following questions:

- Replicability in the region: It appears that prospects for mini hydro project development in Kenya are substantially greater than in most of the other EATTA member states in the region. What appear to be the remaining obstacles in the region?

- Outreach: How effectively were lessons and guidelines derived from project implementation disseminated across the East African Region?

Processes affecting attainment of project results

45 **Preparation and Readiness**. Were the project's objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing agencies properly considered when the project was designed? Was the project document clear and realistic to enable effective and efficient implementation? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities) and enabling legislation assured? Were adequate project management arrangements in place? Were lessons from other relevant projects properly incorporated in the project design? Were lessons learned and recommendations from Steering Committee meetings adequately integrated in the project approach? What factors influenced the quality-at-entry of the project design, choice of partners, allocation of financial resources etc.? Were GEF environmental and social safeguards considered when the project was designed[9]?

46 In addition, specific to this project the evaluation should address the following question:

- GTIEA project life: How realistic was the initial project duration of 4 years for the realization of Hydro projects (from pre-feasibility to actual construction and commissioning)?

47 **Implementation Approach and Adaptive Management**. This includes an analysis of approaches used by the project, its management framework, the project's adaptation to changing conditions (adaptive management), the performance of the implementation arrangements and partnerships, relevance of changes in project design, and overall performance of project management. The evaluation will:

(a) Ascertain to what extent the project implementation mechanisms outlined in the project document have been followed and were effective in delivering project outputs and outcomes. Were pertinent adaptations made to the approaches originally proposed?

(b) Assess the role and performance of the units and committees established and the project execution arrangements at all levels.

(c) Assess the extent to which the project implementation met GEF environmental and social safeguards requirements.

(d) Evaluate the effectiveness and efficiency of project management at the UNEP and the country level. How well was the management able to adapt to changes during the life of the project. How was the relationship between UNEP, AfDB, the executing agency and the project partners (Tea factories)?

(e) Assess the extent to which project management responded to direction and guidance provided by the Steering Committee and UNEP supervision recommendations;

(f) Assess the extent to which the project management responded to findings and recommendations of the project mid-term evaluation;

(g) Identify administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project, and how the project partners tried to overcome these problems.

[9] http://www.thegef.org/gef/node/4562

48 **Stakeholder[10] Participation and Public Awareness**. The term stakeholder should be considered in the broadest sense, encompassing project partners, government institutions, private interest groups, local communities etc. The assessment will look at three related and often overlapping processes: (1) information dissemination between stakeholders, (2) consultation between stakeholders, and (3) active engagement of stakeholders in project decision making and activities. The evaluation will specifically assess:

(a) The approach(es) used to identify and engage stakeholders in project design and implementation. What were the strengths and weaknesses of these approaches with respect to the project's objectives and the stakeholders' motivations and capacities? What was the achieved degree and effectiveness of collaboration and interactions between the various project partners and stakeholders during the course of implementation of the project?

(b) The degree and effectiveness of any public awareness activities that were undertaken during the course of implementation of the project; The evaluation will assess the attitude of the media, the general public and the politicians towards the GTIEA project through interviews and a review of relevant media articles;

49 The ROtI analysis should assist the consultants in identifying the key stakeholders and their respective roles, capabilities and motivations in each step of the causal pathway from activities to achievement of outputs and objectives to impact.

50 **Country Ownership and Driven-ness.** The evaluation will assess the performance of the pilot countries, namely:

(a) In how the countries, including the relevant government bodies, tea factories and other major stakeholders, have assumed responsibility for the project and provided adequate support to project execution, including the degree of cooperation received from the various contact institutions in the countries involved in the project and the timeliness of provision of counter-part funding to project activities;

(b) To what extent the political and institutional framework of the participating countries has been conducive to project performance;

(c) To what extent the Governments have promoted the participation of communities and their non-governmental organisations in the project; and

(d) How responsive the government partners were to EATTA and GTIEA coordination and guidance, and to UNEP supervision.

51 **Financial Planning and Management**. Evaluation of financial planning requires assessment of the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The evaluation will look at actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co-financing. The evaluation will:

(a) Verify the application of proper standards (clarity, transparency, audit etc.) and timeliness of financial planning, management and reporting to ensure that sufficient and timely financial resources were available to the project and its partners;

(b) Assess other administrative processes such as recruitment of staff, procurement of goods and services (including consultants), preparation and negotiation of cooperation agreements etc. to the extent that these might have influenced project performance;

(c) Present to what extent co-financing has materialized as expected at project approval (see Table 1). Report country co-financing to the project overall, and to support project activities at the national level in particular. The evaluation will provide a breakdown of final actual costs and co-financing for the different project components (see tables in Annex 3).

[10] Stakeholders are the individuals, groups, institutions, or other bodies that have an interest or stake in the outcome of the project. The term also applies to those potentially adversely affected by the project.

(d) Describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective. Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector.

52 **UNEP/AfDB Supervision and Backstopping.** The purpose of supervision is to verify the quality and timeliness of project execution in terms of finances, administration and achievement of outputs and outcomes, in order to identify and recommend ways to deal with problems which arise during project execution. Such problems may be related to project management but may also involve technical/institutional substantive issues in which UNEP or AfDB have a major contribution to make. The evaluators should assess the effectiveness of supervision and administrative and financial support provided by UNEP and AfDB including:

(a) The adequacy of project supervision plans, inputs and processes;

(b) The emphasis given to outcome monitoring (results-based project management);

(c) The realism and candour of project reporting and ratings (i.e. are PIR ratings an accurate reflection of the project realities and risks);

(d) The quality of documentation of project supervision activities; and Financial, administrative and other fiduciary aspects of project implementation supervision.

53 **Monitoring and Evaluation**. The evaluation will include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The evaluation will assess how information generated by the M&E system during project implementation was used to adapt and improve project execution, achievement of outcomes and ensuring sustainability. M&E is assessed on three levels:

(a) *M&E Design*. Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified. The evaluators should use the following questions to help assess the M&E design aspects:

- Quality of the project logframe as a planning and monitoring instrument; analyse/compare logframe in Project Document, revised logframe and logframe used in Project Implementation Review reports to report progress towards achieving project objectives;
- SMART-ness of indicators: Are there specific indicators in the logframe for each of the project objectives? Are the indicators measurable, attainable (realistic) and relevant to the objectives? Are the indicators time-bound?
- Adequacy of baseline information: To what extent has baseline information on performance indicators been collected and presented in a clear manner? Was the methodology for the baseline data collection explicit and reliable?
- Arrangements for monitoring: Have the responsibilities for M&E activities been clearly defined? Were the data sources and data collection instruments appropriate? Was the frequency of various monitoring activities specified and adequate? In how far were project users involved in monitoring?
- Arrangements for evaluation: Have specific targets been specified for project outputs? Has the desired level of achievement been specified for all indicators of objectives and outcomes? Were there adequate provisions in the legal instruments binding project partners to fully collaborate in evaluations?

- Budgeting and funding for M&E activities: Determine whether support for M&E was budgeted adequately and was funded in a timely fashion during implementation.

M&E Plan Implementation

The evaluation will verify that:

- The M&E system was operational and facilitated timely tracking of results and progress towards projects objectives throughout the project implementation period;
- Annual project reports and Progress Implementation Review (PIR) reports were complete, accurate and with well justified ratings;
- The information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs;
- Projects had an M&E system in place with proper training, instruments and resources for parties responsible for M&E.

Complementarities with UNEP strategies and programmes

54 UNEP aims to undertake GEF funded projects that are aligned with its own strategies. The evaluation should present a brief narrative on the following issues:

(b) *Linkage to UNEP's Expected Accomplishments and POW 2010-2011.* The UNEP MTS specifies desired results in six thematic focal areas. The desired results are termed Expected Accomplishments. Using the completed ROtI analysis, the evaluation should comment on whether the project makes a tangible contribution to any of the Expected Accomplishments specified in the UNEP MTS. The magnitude and extent of any contributions and the causal linkages should be fully described. Whilst it is recognised that UNEP GEF projects designed prior to the production of the UNEP Medium Term Strategy (MTS)[11]/ Programme of Work (POW) 2010/11 would not necessarily be aligned with the Expected Accomplishments articulated in those documents, complementarities may still exist.

(c) *Alignment with the Bali Strategic Plan (BSP)*[12]. The outcomes and achievements of the project should be briefly discussed in relation to the objectives of the UNEP BSP.

(d) *Gender*. Ascertain to what extent project design, implementation and monitoring have taken into consideration: (i) possible gender inequalities in access to and the control over natural resources; (ii) specific vulnerabilities of women and children to environmental degradation or disasters; and (iii) the role of women in mitigating or adapting to environmental changes and engaging in environmental protection and rehabilitation. Assess whether the intervention is likely to have any lasting differential impacts on gender equality and the relationship between women and the environment. To what extent do unresolved gender inequalities affect sustainability of project benefits?

(e) *South-South Cooperation.* This is regarded as the exchange of resources, technology, and knowledge between developing countries. Briefly describe any aspects of the project that could be considered as examples of South-South Cooperation.

[11] http://www.unep.org/PDF/FinalMTSGCSS-X-8.pdf
[12] http://www.unep.org/GC/GC23/documents/GC23-6-add-1.pdf

E. The Evaluation Consultants' Team

55 A team of two independent consultants will be contracted for this evaluation. The consultant should have the following combined expertise and experience;

- Master's degree or higher in engineering or equivalent with at least 15 years of relevant working experience related to renewable energy, and especially design and construction of mini hydro power (from 500kW to 10MW plants;
- Experience in project development and implementation in developing countries, preferably in Africa and/or Asia;
- Expertise in conducting project evaluations, preferably evaluation of large, multi-country, UN-implemented and GEF-funded environmental projects;
- Good knowledge of UNEP-GEF portfolio and areas of work;
- Excellent communication skills, including fluency in written and spoken English.

56 The **Team Leader** will be responsible for delivering the inception report, coordinating the data collection and analysis, and delivering the draft and final reports to the Evaluation Office. The Team Leader will ensure that all evaluation criteria are adequately covered by the team and that the report content and format fully meets the requirements of this ToR.

57 The **Supporting Consultant** will be responsible of drafting the selected sections of the inception, draft and final evaluation reports and undertaking the agreed portions of the data collection. The Supporting Consultant will be responsible of ensuring that the deliverables meet the quality requirements as set out in this ToR.

58 The consultants will work under the overall responsibility of the UNEP Evaluation Office and will consult with the Evaluation Office on any procedural and methodological matters related to the evaluation. It is, however, the consultant's individual responsibility to arrange for his (her) travel, obtain documentary evidence, meetings with stakeholders, field visits, and any other logistical matters related to the assignment. The UNEP Task Manager, and national EATTA project staff will provide logistical support (introductions, meetings, transport, lodging etc.) for the country visits where necessary, allowing the consultant to conduct the evaluation as efficiently and independently as possible.

59 By undersigning the service contract with UNEP/UNON, the consultants certify that they have not been associated with the design and implementation of the project in any way which may jeopardize their independence and impartiality towards project achievements and project partner performance. In addition, the consultants will not have any future interests (within six months after completion of the contract) with the project's executing or implementing units.

F. Evaluation Deliverables and Review Procedures

60 The consultant team will, after an initial telephone briefing with the UNEP Evaluation Office and the UNEP Task Manager, conduct initial desk review work and prepare and submit a brief inception report to the UNEP Evaluation Office. The inception report should be approved by the UNEP Evaluation Office before starting fieldwork or desk based phone/email interviews.

61 The inception report lays the foundations for the main evaluation. Its purpose is to develop an evaluation framework that includes:

a) Brief background and rationale of the project;

b) A review of the quality of project design to help identify how project design impacts on project implementation and performance[13] (see annex 7);

[13] The review of project design is done on the basis of the project document and log frame. The Consultant should also familiarize her/himself with the history and wider context of the project (details available on UNEP and the project website, documentation from past projects etc). The analysis should be used to complete the 'Template for assessment of the quality of project design' (in the Annex 7 of the TORs). The rating system follows the Evaluation ratings used for the main evaluation (also described in the annex of the TORs).

c) analysis of the project's theory of change, creating a baseline which can be used to assess the actual project outcomes and impacts (expected and unexpected) during field visits and interviews[14];

d) A detailed plan for the evaluation process[15].

62 The outline of the inception report is presented in Annex 1(a).

63 **The main evaluation report** should be brief (no longer than 35 pages – excluding the executive summary and annexes), to the point and written in plain English. The report will follow the annotated Table of Contents outlined in Annex 1(b). It must explain the purpose of the evaluation, exactly what was evaluated and the methods used (with their limitations). The report will present evidence-based and balanced findings, consequent conclusions, lessons and recommendations, which will be cross-referenced to each other. The report should be presented in a way that makes the information accessible and comprehensible. Any dissident views in response to evaluation findings will be appended in footnote or annex as appropriate.

64 **Review of the draft evaluation report**. The consultant team will submit the zero draft report to the UNEP Evaluation Office at a date previously agreed, and revise the draft following the comments and suggestions made by the Evaluation Office. The Evaluation Office will then share the first draft report with the UNEP Task Manager for review and comments. The UNEP Task Manager will forward the first draft report to the executing agencies in the pilot countries and other relevant project stakeholders. Stakeholders may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. Comments would be expected within two weeks after the draft report has been shared. Any comments or responses to the draft report will be sent to the UNEP Evaluation Office for collation. The Evaluation Office will provide the comments to the Consultant in preparing the final draft report. The Consultant will submit the final draft report no later than 2 weeks after reception of stakeholder comments. The Consultant team will prepare a **response to comments** that contradict the findings of the evaluation team and could therefore not be accommodated in the final report. This response will be annexed to the MTE report to ensure full transparency.

65 Consultations will be held between the consultant team, Evaluation Office staff, the UNEP/GEF, UNEP/DTIE and key members of the project execution team. These consultations will seek feedback on the proposed recommendations and lessons.

66 **Submission of the final Terminal Evaluation report**. The final report shall be submitted by Email to:

Segbedzi Norgbey, Head
UNEP Evaluation Office
P.O. Box 30552-00100
Nairobi, Kenya
Tel.: (+254-20) 762 3387
Email: segbedzi.norgbey@unep.org

67 The Head of Evaluation will share the report with the following persons:

Maryam Niamir-Fuller, Director
UNEP/GEF Coordination Office

[14] Annex 6 of the TORs on Introduction to Theory of Change/Impact pathways describes in details the Theory of Change approach. The Theory of Change analysis should be captured in a Theory of Change diagram. The diagram can be shared with project stakeholders in the course of the evaluation, as tool to aid discussion. Please note that the ratings requested in the annex are not needed in the inception report's Theory of Change analysis. The consultant should complete the ratings after the field visits/interviews. The ToC diagram and ratings should be incorporated in final evaluation report.

[15] The evaluation process plan is based on a review of the project design, theory of change analysis and also of the project documentation (listed in TORs). This should include a description of evaluation methodologies to be used and description of logistics (selection of sites to be visited)/dates of evaluation activities etc. The evaluation plan should also include an Evaluation Framework, listing a summary of evaluation questions/areas to be explored/questions raised through document review; list of data sources, indicators; list of individuals to be consulted; and detailed distribution of roles and responsibilities among evaluation consultants (for larger evaluation teams).

P.O. Box 30552-00100
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Tel: (+254-20) 762 4686
Email: maryam.niamir-fuller@unep.org

Geordie Colville/Peerke de Bakker
Task Manager UNEP/DTIE
P.O. Box 30552-00100
Nairobi, Kenya
Tel: (+254-20) 762 (2)3257
Email: geordie.colville@unep.org
and/or peerke.bakker@unep.org

68 The final evaluation report will be published on the UNEP Evaluation Office web-site www.unep.org/eou and may be printed in hard copy. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website.

69 As per usual practice, the UNEP Evaluation Office will prepare a **quality assessment** of the zero draft and final draft report, which is a tool for providing structured feedback to the evaluation consultants. The quality of the report will be assessed and rated against both GEF and UNEP criteria as presented in Annex 4.

70 The UNEP Evaluation Office will also prepare a **commentary** on the final evaluation report, which presents the Evaluation Office ratings of the project based on a careful review of the evidence collated by the evaluation consultant and the internal consistency of the report. These ratings are the final ratings that the UNEP Evaluation Office will submit to the GEF Office of Evaluation.

G. Resources and Schedule of the Evaluation

71 The **Team Leader** will be contracted for 6.5 weeks, spread over a period of 14 weeks. The Team Leader will visit the UNEP Evaluation Office and the project Task and Fund Management Officers in Nairobi and the East African Tea Trade Association in Mombasa. S(he) will also visit project demonstration sites of Gura and North Mathioya in central Kenya, Nchwera in the Bushenyi district of western Uganda and Giciye in north-west Rwanda as well as engage in meetings with all relevant project stakeholders at the project sites as well as in Nairobi, Kampala and Kigali.

72 The **Supporting Consultant** will be contracted for 4.5 weeks, spread over a period of 14 weeks. The Supporting Consultant will visit the UNEP Evaluation Office and the project Task and Fund Management Officers in Nairobi and the East African Tea Trade Association in Mombasa. S(he) will also visit project demonstration sites of Tagabi in western Kenya, Gura and North Mathioya in central Kenya, and Suma in Western Tanzania as well as engage in meetings with all relevant project stakeholders at the project sites as well as in Nairobi and Dar es Salaam.

Table 9: Tentative Evaluation Timeline

Activity	Time Frame
Start of contract	24 June 2013
Inception report by Team Leader sent to Evaluation Office	8 July 2013
Meetings at UNEP in Nairobi	16 July 2013
Country visits	17 – 26 July 2013
Zero draft report sent to Evaluation Office	19 August 2013
First draft report sent to Evaluation Office	22 August 2013
Report reviewed by Evaluation Office and Stakeholders	5 September 2013
Collated comments by EO and Stakeholders sent to the Consultant	9 September 2013
Final report by Consultant sent to Evaluation Office	16 September 2013
End of contract	29 September 2013

H. Schedule of Payment

73 The consultants will be hired under an individual Special Service Agreements (SSA). One of the following two contract options will be used :

74 Lump-Sum Option:

- The consultant will receive an initial payment covering the travel costs upon signature of the contract. A further 20% will be paid upon acceptance of the inception report and 40% will be paid upon acceptance of the draft report. A final payment of 40% will be made upon satisfactory completion of work. The fee is payable under the individual Special Service Agreement (SSA) of the evaluator and is **inclusive** of all expenses such as travel, accommodation and incidental expenses.

75 Fee-only Option :

- The consultant will receive an initial payment of 20% of the total amount upon acceptance of the inception report. A further 40% will be paid upon acceptance of the draft report and the final payment of 40% will be made upon acceptance and satisfactory completion of work. The fee is payable under the individual SSAs of the evaluator and is **NOT** inclusive of all expenses such as travel, accommodation and incidental expenses. Ticket and DSA will be paid separately.

76 In case the consultant is not able to provide the deliverables in accordance with these TORs, in line with the expected quality standards by the UNEP Evaluation Office, payment may be withheld at the discretion of the Head of the Evaluation Office until the consultants have improved the deliverables to meet UNEP's quality standards.

77 If the consultant fails to submit a satisfactory final product to UNEP in a timely manner, i.e. within one month after the end date of their contract, the Evaluation Office reserves the right to employ additional human resources to finalize the report, and to reduce the consultants' fees by an amount equal to the additional costs borne by the Evaluation Office to bring the report up to standard.

Annex 2. Evaluation program

A tentative schedule for the evaluation timeframe was included in the evaluation ToR, and was adopted by the Evaluation Team without further modifications:

Table3: Schedule for the evaluation

Activity	Time Frame
Start of contract	24 June 2013
Inception report by Team Leader sent to Evaluation Office	8 July 2013
Meetings at UNEP in Nairobi	16 July 2013
Country visits	17 – 26 July 2013
Zero draft report sent to Evaluation Office	19 August 2013
First draft report sent to Evaluation Office	22 August 2013
Report reviewed by Evaluation Office and Stakeholders	5 September 2013
Collated comments by EO and Stakeholders sent to the Consultant	9 September 2013
Final report by Consultant sent to Evaluation Office	16 September 2013
End of contract	29 September 2013

The Evaluation Team has visited Nairobi and Mombasa (Kenya), Kampala (Uganda), Kigali (Rwanda) and Dar es Salaam (Tanzania), apart from all the project sites and the corresponding tea factories (owners of the SHP) in Kenya, Uganda, Rwanda and Tanzania.

The following list specifies individuals and institutions which have been consulted:
Table 10: Consulted Individuals and Institutions

Name	Organization		Contact details
Tiina Piiroinen	UNEP Evaluation	15.07.2013	Tiina.Piiroinen@unep.org
Peerke de Bakker	GTIEA Task Manager. Programme Officer Energy UNEP-DGEF	1.09.2013	peerke.bakker@unep.org
Paul Vrontamitis	UNEP Fund Manager	15.07.2013	Paul.Vrontamitis@unep.org
Abungana Khasiani	Ex-Project Director, GTIEA	16.07.2013	khasianiak@yahoo.com
Eng. Man Bahadur Rai	Ex- GTIEA. Consultancy Division KTDA Power Company	16.07.2013	
Lucas Maina	Ex-Project Manager, GTIEA, now General Manager, KTDA Power Company Ltd.	16.07.2013	lgmaina@ktdateas.com
Youssef Arfaoui	AfDB Task Manager for GTIEA	19.07.13	Y.ARFAOUI@afdb.org
Graeme Watson		16.07.2013	gwatson@wananchi.com
Edward K. Mudibo	Managing Director, EATTA	17.07.2013	Edward.mudibo@eatta.co.ke
Florence Owino	Admin & Financial Account, EATTA	17.07.2013	Florence@eatta.co.ke
Joshua Aroni	Ex-Fund Manager, EATTA,	17.07.2013	Joshua.aroni@cemtechsanghi.com

	now General Manager, Finance Cemetech		
Mogire Philip	VS Hydro	19.07.2013	philosiemo@yahoo.com (0725018138)
Ann Mbugua	KTDA Power Company (KPTC)		ambugua@ktdteas.com (0722807406)
Krishna Neupane	Hydro-Consulting Engineer	19.07.2013	Krishna.neupane@bpch.com.np (0722533926)
Sarok Lal Shrestha		19.07.2013	
K.P. Siripathiron	VS Hydro	19.07.2013	sirivsh@yahoo.com (0735309019)
Eng. Bengiel H. Msofe	Director Rural Energy Agency - REA Tanzania	22.07.2013	bmsofe@rea.go.tz; bmsofe@gmail.com; +255 784 969313
Peter Rowland	Chairman, Wakulima Tea Company	23/24.07.2013	prowland@iwayafrica.com
Engineer Anthony O. Wandede	Electrical Supervisor, Power Stations and Power lines Tagabi Tea Company	26.07.2013	Anthony.wandede@unilever.com
Mr. Davis Korir	Team Leader, Tagabi Small Hydro	26.07.2013	
Eng. Silas Mutuerandu	Head, Engineering, Unilever Tagabi Tea	26.07.2013	silas.mutuerandu@unilever.com
Godfrey Turinabo	Standards Officer, Igara Growers Tea Factory	23.07.2013	marketing@ugatea.com
Aloysius Hategа Nsance	Production Manager Igara Growers Tea Factory	22.07.2013	
Eustachius Kajubu	Factories Engineer Uganda Tea Development Agency	22.07.2013	kajubusta@gmail.com
Robert Ejiku	Group Manager Igara Growers Tea Factory	22.07.2013	
James Baanabe	Ag. Comm. Energy Resources Department Ministry of Energy and Mineral Development	23.07.2013	baanabe@energy.go.ug
Eng. Geoffrey Ssebuggwawo	Director Energy for Rural Transformation Private Sector Foundation	24.07.2013	gssebuggwawo@psfuganda.org.ug
Alain Kabeja	Principal Advisor to the Chairman Rwanda Mountain Tea Ltd.	25.07.2013	alainkabeja@sp.co.rw
Anthony Butera	Rwanda Mountain Tea Ltd.	24.07.13	Phone conversation Abutera30@gmail.com
Patrick Tuysinge	Legal&Administration Officer Rwanda Mountain Tea Ltd.	25.07.2013	Tuysinge@rwandamountaintea.com
Jean-Louis Lejeune	Engineer Chief of Giciye SHP Working Team Control Misssion MCH Giciye	26.07.2013	lejeune@sher.be
Georges Appelmans,	Director, RMT	26.07.2013	gappelmans@rmt.be

David Karibata,	Director of Works Horizon/Aquifer	26.07.2013	
Kome Hakizimana	Topographer Horizon Aquifer	26.07.2013	
Jean Celse	Team Leader FOREMAN	26.07.2013	Jcelse@sher.be
Jean Bosco Muhire	Supervisor SHER	26.07.2013	jbmuhire@sher.be
Papias Harerimana	Supervisor SHER	26.07.2013	Pharerimana@sher.be
Alexis Mutware	Head of Section for Electricity Regulation	26.07.2013	alexis.mutware@rura.rw
Eng. Isaac Kiva	Director, Renewable Energy Unit, Ministry of Energy and Petroleum, Kenya	13.08.2013	Isaac_kiva@yahoo.com
Robert Pavel Oimeke	Director, Energy regulatory Commission	14.08.2013	Robert.pavel@erc.go.ke

Annex 3. Bibliography

Apart from the Project website, the following reports and document were repeatedly consulted as sources of information about the GTIEA Project development

- GTIEA TE ToR June 2013
- GTIEA Project Document
- GTIEA MIDTERM Final Eval. Report
- 2683_2012PIR_GTIE_UNEP_Regional
- 2683_GTIEA_PIR&TT_FY09_ Final
- 2683_PIR GTIEA FY10-MPJ Progress Report July-Dec 08
- 2683_PIR GTIEA FY11 PdB Final
- PIR_310713 (first draft)
- Progress Report Aug-Dec 07
- Progress Report July-Dec 08
- Progress Report July-Dec 09
- Progress Report July-Dec 10
- Progress Report July-Dec 11
- Terminal Report GTIEA
- October 2012 GTIEA Project Newsletter
- ProEcoServ MTE Inception Report_280313
- TE NEPAD_Inception_Report_Final_6 May 2013
- GFL 4981 Financial Rev 3
- GFL-4981 Financial Rev 2
- GFL-4981Financial Rev 1
- Final Audit
- Kenya Power- No monopoly
- A presentation to stakeholders on Greening the Tea Industry in EA project
- Power Wheeling Presentation
- FAO Climate change presentation
- Final Power Wheeling Case Studies Report - April 2012
- GTIEA II- Management Proposal- Nov 2012
- GTIEA_Enews_2012_ Final
- Kenya CC Tea - FAO project brief
- KTDA- National Tea Industry Stakeholders Forum June 2013 (draft)
- Opening Remarks for GTIEA Conference- Mr.Waireri
- Support for Development of Small Hydro - Concept note_13_12_2011
- Tea Board of Kenya Presentation
- Energy Policy and Strategy May 2011 (Rwanda)
- Regulations on Feed-in Tariffs Hydro Power Plants (Rwanda)
- Electricity Licensing Regulations (Rwanda)
- Fees for electricity licenses (Rwanda)
- Electricity Licence Application Form (Rwanda)
- Kipchoria Final Report (Feasibility Study)
- Feasibility Study Nchwera SHP
- Feasibility Study Gura SHP
- Feasibility Study Tagabi
- Feasibility Study Giciye

- Pre-feasibility Study Kenya Nandi Hills
- Pre-feasibility Study Malawi Lujeri
- Pre-feasibility Study Malawi Lychenya
- Pre-feasibility Study Malawi Muluzi
- Pre-feasibility Study Malawi Ruo
- Pre-feasibility Study Rwanda Base 2
- Pre-feasibility Study Rwanda Giciye
- Pre-feasibility Study Tanzania Luhololo
- Pre-feasibility Study Tanzania Suma

Annex 4. Summary of finance information and project expenditure by activity

Co-financing (Type/Source)	**IA own Financing (US$)**		**Government (US$)**		**Other* (US$)**		**Total disbursed (US$)**
	Planned	Actual	Planned	Actual	Planned	Actual	
Cash contributions							
GEF Trust Fund					2 854 000	2 854 000	**3,135,126.20**
Tea Factories					7 000 000	24 932	
Financial Institutions					15 000 000		
EATTA					96 000	12 000	
Coopener					-		
AfDB					-		
Pro invest					130 000	2 441 947	
				Totals:	**25,080,000**	**3,135,126**	
In Kind							
EATTA					109 526	558 101	**355,358**
Coopener					418 600		
AfDB					224 640		
Pro invest					130 000	288 513	
Coopener/EC Others					614 000		
Construction Companies					220 000		
Government			2 680 000				
				Total:	**3,782,766**	**355,358**	

Annex 5. Evaluation questions and indicators

Evaluation Criteria	Key Evaluation Questions	Indicators	Sources	Data collection system
1.**Attainment of Objectives and Planned Results**				
Achievement of Outputs and Activities	Were the planned outputs produced? Were they produced in due time?	Degree of project implementation progress relative to expected level at project end.	Analysis of project documents. Meetings with project staff and stakeholders.	Desk review Interviews with project staff and other stakeholders.
Effectiveness	If the SHP has been commissioned: What is the share of total electric consumption from SHP? If not: What is the expected date of commission? What are the causes of delay? Is financing guaranteed?	Number and capacity of plants commissioned. Percentage of works carried out. Expected time of commissioning.	Analysis of project documents, especially Final Report and PIRs. Meetings with project staff and stakeholders.	Desk review. Visit to project sites. Conversations with project staff and representatives of beneficiary tea factory.
Efficiency	Any delays? Why? Measures taken to recover time? Any increment in costs? Why? Was the successful bid reasonable? Are there financial difficulties?	Comparison between the initial schedule and the present situation. Present costs vs. estimated costs.	Analysis of project documents, especially PIRs and Final Report. Meetings with representatives of tea factories and project personnel.	Desk review. Conversations with project staff and representatives of companies in charge of SHP building works.
Review of Outcomes to Impacts	Has the initial opinion about SHP changed? Why? In what sense?	Existence of plans to build up new SHP.	Meetings with representatives of tea factories, electric regulatory agencies, financing institutions.	Desk review of PIR. Conversations with stakeholders.
2.**Sustainability and catalytic role**				
Socio-political sustainability	Has there been any variation in the regulations concerning SHP? Is maintenance guaranteed after project termination?	Regulations concerning IPP Regulation concerning licenses Specific regulation for SHP.	Analysis of present regulations and drafts of future ones (if any).	Desk review. Meetings with relevant energy authorities.
Financial resources	Is financing of the project guaranteed	Specific project documents and	Feasibility study.	Desk review.

	until termination? Is future maintenance guaranteed?	financial agreements.	Specific project documents.	Meetings with relevant stakeholders.
Institutional framework	Is there any regulatory approach to use of renewable energy sources? Is there any modification of existing regulations envisaged?	Existence of RES-specific country legislation.	Analysis of applicable laws.	Desk review. Web pages of energy regulators. Meetings with relevant energy authorities.
Environmental sustainability	Are there any limitations in use of water resources which can result in any variation of the expected environmental benefits of the project?	Compatibility between hypothesis used during feasibility study and real situation.	Environmental and use-of-water legislation.	Desk review. Conversations with relevant authorities.
Catalytic Role and Replication	Is there any intention of building up new SHP? If yes: From the tea factory? From other industries? From public institutions? Has any regulatory measurement changed as a result of the project activities? Is there any modification envisaged? Would it be easier now to get financing resources for new SHP projects? Have been dissemination activities carried out	Number of future projects. Existence of draft regulations. Dissemination activities carried out.	Conversations with SHP owners and regulatory activities.	Meetings with relevant stakeholders and authorities.
3.**Processes affecting attainment of project results**				
Preparation and readiness	How realistic was the initial project duration of 4 years for the realization of Hydro projects (from pre-feasibility to actual	Total number of years until commissioning of the respective SHP.	Conversations with project staff and stakeholders.	Desk review. Meetings with executing agency, tea factories and companies carrying out the SHS

	construction and commissioning)?			construction works.
Implementation Approach and Adaptive Management	When was taken the decision to increase the SHP output from the 500 kW envisaged to the present values? By whom? How was the relation with other project stakeholders? And with the Steering Committee? Were the recommendations of the Mid-Term Evaluation followed?	Recommendations of the Mid – Term Evaluation.	Conversations with stakeholders.	Desk review, especially of PIRs. Meetings with stakeholders.
Stakeholders participation and public awareness	Did the media make mention of the project activities? How often?	Number and frequency of mentions.	Project newsletters. Press extracts.	Desk review. Meetings with stakeholders.
Country ownership and driven-ness	To what extent has the Government collaborated with the project?	NA	Press extracts. Conversations with authorities.	Desk review. Meetings with stakeholder, especially public bodies.
Financial planning and management	Are there variations between financial planning and real situation? What were the causes? How was the situation solved	Differences (in amounts and dates of expenditure) between financial planning and actual figures.	Comparison between financial planning and actual figures.	Desk review. Meetings with personnel responsible of financing issues.

Annex 6. CVs of the Consultants

Manuel Blasco, Team Leader

1. **Family name:** **Blasco**
2. **First names:** **Manuel**
3. **Date of birth:** 06/06/1950
4. **Nationality:** Spanish
5. **Place of residence:** Madrid (Spain)
6. **Education:**

Institution [Date from – Date to]	Degree(s) or Diploma(s) obtained:
Superior Technical School of Industrial Engineering, Polytechnic University of Madrid (1970-1976)	MSc Industrial Engineering

7. **Language skills:** Indicate competence on a scale of 1 to 5 (1 – excellent; 5 – basic)

Language	Reading	Speaking	Writing
Spanish	1	1	1
English	1	1	1

8. **Membership of professional bodies:** Professional Association of Industrial Engineers, Madrid, Spain
9. **Other skills:** (e.g. Computer literacy, etc.); Experience in Project Cycle Management and Logical Framework Tools, Energy Policy, Institutional knowledge and legal framework of energy regulatory agencies, Econometric analysis, Performance benchmarking. Microsoft Office in WINDOWS environment.
10. **Present position:** Independent energy consultant
11. **Years within the firm:** 13 (as independent consultant)
12. **Key qualifications:** (Relevant to the project)

- Qualified senior energy expert with over 30 years of experience in the energy industry and extensive knowledge of the technical and economic characteristics of energy technologies.
- Solid experience of projects financed by the European Commission (EC) and other donors: DFID, UN and International Energy Organizations like the International Energy Agency) in the fields of energy, electricity, including regulatory and legal issues, energy policies, energy markets, development of renewable energy sources, energy efficiency, methodologies for tariff setting, revision of transmission & distribution electric codes, licensing procedures and creation of markets for electricity.
- Solid understanding of the renewable energy business and integration of renewable energy technologies in transmission and distribution networks.
- Specific background in the field or rural electrification, both isolated and grid-connected, using renewable and conventional energy sources.
- Large experience in participation in workshops, debated and round tables, as a member (and chairman in some cases) of committees and working groups, at national and international level.
- Specific experience in analysis of the energy outlook in different countries, as well as preparation of energy policies and action plans.
- Excellent and highly experienced in networking and inter – exchange and dissemination of information.
- Specific experience in the formulation and analysis of regulation of the energy sector.
- Solid background in the field of energy regulatory issues and in the creation of regulatory frameworks for the participation of the private sector in the electricity supply business
- Solid knowledge of the EC (including EDF procedures), including good knowledge of Project Cycle Management and project identification, project formulation, developing of project Terms of Reference, preparation of project identification fiches, action fiches and methodologies for project evaluation.

- Experience in institutional knowledge and capacity building of energy regulatory agencies.
- Experience working for the Spanish Government and the Regulatory Agency in the deregulation process of the Spanish electricity sector, analyzing mechanisms applied in other European countries to create energy markets and to guarantee free private sector participation in a competitive and free market. This framework included a large number of legal dispositions, including the analysis of model supply contracts, access to transmission & distribution networks, creation of adequate grid codes, definition of methodologies to define tariffs for electricity and the treatment to be given to independent power producers using renewable energy.
- Experience in harmonization of energy legislation and regulatory framework with EU acquis, including mechanisms to encourage use of renewable energy sources for electricity generation.
- Solid understanding of and knowledge of electricity consumption markets in Europe, including deregulation processes and their effects.

13. Specific experience in the region (Southern Europe):

Country	Date (from – to)
Bosnia - Herzegovina	August 2011 – December 2011 May 2009 – May 2010 January– June 2009
Bulgaria	May 2005 – Jan 2007
Romania	April December 2000

14. Professional experience

Date from – Date to	Location	Company & Reference Person (Name & Contact)	Position	Description
May 2013	Homework (Madrid)	**Danish Management A/S (Ltd.)** Anise Sacranie asa@danishmanagement.dk	Senior Expert	Preparation of tendering documents for the new EU Framework on Energy
June – October 2013	Kenya, Uganda, Rwanda	**United Nations Environmental Programme (UNEP)** Tiina Piiroinen Tiina.Piiroinen@unep.org	Team leader	Final evaluation of a project devoted to develop hydropower schemes to supply electricity the tea industry and electrification of neighbouring rural areas in East Africa.
June – December 2013	Egypt	**MWHGLOBAL** Luigi Vargiu Luigi.Vargiu@uk.mwhglobal.com	Senior Expert	Support to the Egyptian Electric Utility and Consumer Protection Regulatory Agency (EGYPTERA) and to the Egyptian Electricity Transmission Company (EETC). Review and implementation of Grid Code
March-April 2012	Homework (Madrid)	**Danish Management A/S (Ltd.)** Anise Sacranie asa@danishmanagement.dk	Senior Expert	Preparation of a Monitoring Manual for energy projects for EU Delegations.
August 2011 – December 2011	Bosnia - Herzegovina	**European Commission**-AETS Remy Naude remy.naude@aets-europe.fr	Team leader	Detailed analysis of the legislation of BiH in the field of electricity and comparison with the EU acquis. Identification of gaps. Project financed by the European Commission. Budget 0.2 M€.
June 2010 – July 2010	Cuba	**United Nations Environmental Programme (UNEP)** Michael Spilsbury michael.spilsbury@unep.org	Team Leader	Mid-Term evaluation of a project devoted to the development of renewable energy sources (biomass, wind) for generation of electricity (grid-connected and isolated for rural electrification) and thermal energy for industrial purposes in Isla de la Juventud (Cuba). Institutional knowledge of Cuban energy system. Project financed by UNEP. Total project budget 16 M US$.
August 2009 – July 2010	South Africa, Gambia, Cameroon, Ghana, Senegal, Uganda, Zambia	**European Commission**-AETS Magdalena Wancowicz Magdalena.wancowicz@aets-europe.fr	Senior Electricity Expert	Strengthening the capacity of the African Forum for Utility Regulators (AFUR). Cross-border trade in electricity, organization of power market structures and regional integration. Cross – border transmission issues. Training on economic fundamentals related to electricity regulation, rural electrification, public-private partnership and on regulatory aspects concerning quality of service. Encouragement of South-South cooperation. Analysis of the electricity sector in Cameroon, Ghana, Senegal, Uganda and Zambia. Provided institutional capacity building to AFUR members as well as dissemination of information among AFUR member countries through seminars and networking.
May 2009 – May 2010	Bosnia - Herzegovina	**European Commission** -BESEL, S.A./Guillermo Lopez glopez@besel.es	Senior Expert	Support to the BiH institutions in implementation of the EU Directive on promotion of green electricity. Development of renewable energy sources**.** Institutional knowledge of BiH energy system.

January– June 2009	Bosnia - Herzegovina	**European Commission** -SOGES, S.P.A./Elisabeta Pop elisabeta.pop@sogesnetwork.eu	Senior Expert	EuropeAid Project. Definition of projects to be funded under IPA 2010 devoted to reinforcement of regulatory bodies, creation and liberalization of markets, energy efficiency and use of renewable energy sources. Project identification. Project formulation: Terms of reference, Project Identification Fiches and Action Fiches.
Oct 2007 – March 2008	Republic of the Marshall Islands, Federated States of Micronesia, Republic of Palau	**European Commission** -EPU – NTUA David Moissis Fwc-epu@epu-ntua.gr	Team Leader	Definition and identification of projects devoted to use of renewable energy sources for rural electrification (solar and mini hydro) and to improvements in energy efficiency, including DSM in the residential sector in island countries. Projects to be financed through EDF 10. Project identification. Project formulation. Total funding 13 M€.
May 2005 – Jan 2007	Bulgaria	**European Commission** -BESEL, S.A. (see above)	Senior Electricity Expert	Europeaid Project. Assistance to the Energy Regulatory Authority. Development of secondary legislation in the fields of electricity and gas, including methodologies for tariffs, ancillary services and use of renewable energy sources. Review of technical codes for transmission and distribution of electricity. Analysis of impact on distribution grids of plants using renewable energy sources (wind and grid connected solar PV) owned by independent power producers.
Oct 2005 – Jan 2009	Madrid, Spain	**Carlos III University** Antonio Lecuona lecuona@ing.uc3m.es	Associated professor	Teaching of Energy and Environment Engineering Lay out and characteristics of renewable energy plants (wind and PV, both stand alone and grid connected). Definition of components. Evaluation of renewable energy resources. Connection to transmission or distribution grids. Solar thermal and photovoltaic technologies.
Dec 2005 – Jan 2006	Honduras	**European Commission** -SOFRECO Carlos Zamorano Carlos.zamorano@sofreco.com	Team Leader	Mid - term evaluation of a project devoted to rural electrification (stand - alone PV and small hydro in different areas), analysis and improvement of a distribution network. Energy efficiency measures in industrial and public buildings. Rural electrification (solar photovoltaic and small hydro). Improvement of distribution grids for electricity. Total project budget 6 M€.
Sep 2003 – July 2005	Pamplona and Madrid (Spain)	**CENER** (National Centre for Renewable Energy of Spain) Juan Ormazabal jormazabal@cener.com	Technical Director	Research, development and demonstration activities in the fields of renewable energy sources (photovoltaic, biomass and wind). Technical assistance to electricity generation units using renewable energy sources. Head of a team of 60 technicians and workers. Scheduling, organising and supervision of team. Evaluation of renewable energy resources (wind, solar and biomass).Characterization of PV panels. Definition and supervision of PV projects (from 100 to 800 kW). Monitoring of existing grid-connected PV plants.
June 2003 – Jan 2004	Hungary	**European Commission** -BESEL,S.A (see above)	Senior Energy Expert	Europe Aid project. Assistance to the Hungarian Energy Authority related to EU legislation, regulatory issues and energy policies for use of renewable energy sources. Adequation of the Hungarian energy law to the acquis communitaire. Assessment in the field of connection of renewable energy plants to the grid; problems involved, voltage and frequency stability). EU-Twinning project.
Nov 2001 – Aug 2003	Madrid, Spain	**EMVS** (Empresa Municipal de la Vivienda y Suelo de Madrid)	Senior Engineer	Definition of installations for heating, cooling and warm water systems in multi-family dwellings using both conventional and renewable energy. Analysis of available renewable energy sources. Definition of back up natural gas fuelled systems to guarantee supply. Led a team composed by 6 technicians.

March 2001	Mar del Plata (Argentina)	**DFID**-EDEA (Empresa Distribuidora de Energía Atlántica)	Senior External Consultant	Assessment related to tariffs, power purchase agreements, supply options and DSM programs, including energy efficiency. Definition of standard contracts for purchases of power generated by independent power producers, using either conventional or renewable energy sources.
April 2000 – Dec 2000	Romania	**European Commission** -IDOM, S.A.	Senior Electricity Expert	Europe Aid project. Assistance to the Romanian Energy Authority. Elaboration of tariff methodologies for electricity and heat, including transmission, distribution, ancillary services, independent power producers and self-producers, end-users and splitting of costs between electricity and heat in cogeneration plants. Analysis and review of technical codes for transmission, distribution and connections for independent power producers. Preparation of licensing procedures.
April 1999 –March 2000	Madrid, Spain	**Weder & Weather**	**Technical Director**	Managing and control of projects and build-up of cogeneration plants. Cogeneration plants of up to 500 kW. Leading, organising and supervision of a10 technicians team.
Feb – Dec 1979	Jülich (Germany)	**IEA/ KFA** (Forchungszentrum)	Collaborator	MARKAL project. Impact analysis of the oil crises in the energy supply of IEA member countries. Evaluation of technical, economic and environmental characteristics of energy technologies. Project financed by the International Energy Agency.
Feb 1979 – Oct 1998	Madrid	**Unidad Eléctrica, S.A.** (UNESA)	Head of Technical Division	Analysis and definition of criteria for setting of tariffs for electricity in Spain. Works related to the entire process of transition from the vertically integrated electric system in Spain to the creation of a liberalized market. Analysis of regulatory issues related to different types of electric markets, considering both natural monopolies (transmission and distribution) and activities subject to competition (generation and final supply to consumers). Follow up of electrical markets evolution in other IEA countries through participation in international Working Groups and Committees in the respective countries. Analysis of different models of markets for electricity before the liberalization of the Spanish electric system. Analysis of regulatory issues relative to cross-border trade of electricity and high voltage transmission. Control of working groups on energy planning, new renewable technologies, refurbishment of thermal plants, role of electricity in the energy spectrum. Distribution networks.
1974 – 1978	Madrid	**Superior Technical School of Industrial Engineering**	Auxiliary Staff, Teacher	Teaching activities. Turbines, internal combustion engines and fluid mechanics. Work on performance improvement of internal combustion engines

15. 0ther relevant information (e.g. Publications)

- Member (and co-ordinator) of several committees and working groups, both at national and international level. These committees studied various topics, such as photovoltaic energy, thermal generation, fuel cells, and competitiveness of energy technologies.
- Spanish representative in the Solar Photovoltaic Program of the International Energy Agency.
- Co-author of the MARKAL model for the International Energy Agency (IEA). This model was created to be used as a tool to mitigate the effects of the oil crises of 1973 and 1979, and its purpose was to perform econometric analysis of the most adequate ways to guarantee the energy supply of IEA member countries. The model was designed for use of different objective functions, such as minimise oil imports, minimise cost of energy supply, maximise use of renewable forms of energy, etc. as well as different combinations among them.
- Spanish representative in the IEA working team in charge of the "Energy after the Eighties" study, which analysed the future energy outlook for IEA member countries after the oil crises.
- Advisor at the IEA headquarters in Paris, collaborating in a study devoted to analyse the future evolution of the penetration rate of electricity in the global energy consumption of IEA member countries. The required analysis included an assessment on electricity final costs, covering all kinds of technologies for generation of electricity, as well as transmission and distribution costs and environmental advantages of electricity use, among other aspects.

Publications:

- Energy Technology Data Handbook. Vol. 1 (Conversion Technologies), January 1980. Jülich (Germany), Energy Technology Data Handbook. Vol. 2 (End-use Technologies), October 1980. Jülich, Energy Scenarios and Impact of New Technologies for Spain. April 1981. Jülich, Summary Report on Technology Characterizations. December 1982. Jülich, Energy After the Eighties. Elsevier, Amsterdam 1992, Environmental Impact of Energy Technologies, NOx Control Technologies. March 1993, Emissions of Trace Species by Coal-fired Power Plants in Europe. February 1997, Selective Catalytic Reduction. February 1997, Co-firing of Biomass and Waste with Coal. March 1997, The Effect of Coal Quality on NOx Emissions. April 1997, Gas Turbine Emissions. October 1997, Continuous Emission Monitoring in Power Stations and CHP Plants. October 1997, Analysis of Cost-efficient CO2 Reduction Options. Country Report for Spain. Karlsruhe, January 1991, Fuel Cells. State of the Art and Perspectives. 1993 y 1998. Spanish and English versions, Status Report on PV Power Applications in Spain. 1995 and 1997.

CURRICULUM VITAE (CV) STEPHEN MUTIMBA

Summary

Stephen Mutimba is the Managing Director of Camco Advisory Services (K) Limited and brings 20 years of experience in renewable energy, renewable energy policy development and natural resource management. He has demonstrated experience in the promotion of clean energy including small hydros wind, sustainable charcoal having managed related projects in Kenya, Uganda, Tanzania, Zambia, Malawi, Burundi and Rwanda. In 2004 to 2006, Stephen led and facilitated private sector participation in the formulation of the Kenya National Energy Policy (Sessional Paper Number 4) and Energy Act, 2006, where he ensured private sector and parliamentarians are educated on the implication of climate change on the energy sector and the Economy prior to its enactment. In 2007, Stephen helped found the Parliamentary Network on Renewable Energy and Climate Change (PANERECC) http://www.panerecc.or.ke), a cross party energy and climate change network for members of parliament in Kenya. Stephen is a founder member of the Kenya Charcoal Working Group (KCWG) lobby that was instrumental in drafting, popularizing and promoting the charcoal regulations which were adopted under the Forest Act (2005) and later gazetted as law in 2011. These achievements stemmed from a multi-institutional national charcoal survey that covered 24 districts and involved over 4,000 interviews with charcoal producers, transporters and vendors in Kenya led by Camco. The outputs of this survey formed the basis for policy dialogue resulting in the current policy and legislation governing charcoal production in Kenya. Stephen has also been on the forefront of the sustainable charcoal advocacy in the region for several years now. He led an awareness creation and capacity building initiative on sustainable charcoal targeting sector leaders and government officials. This event drew policy makers across Africa including the EAC, ECOWAS, ECREE and SADC. His experience also links sustainable charcoal advocacy with climate change mitigation. Stephen has been involved in CDM project design including developing PINs and PDDs, supporting and building DNAs technical capacities in Kenya and Uganda, as well as developing official position papers for international multi-lateral negotiations including the recently concluded Rio +20 conference in Brazil. He holds a Master of Science degree from Oxford University and a Certificate on Economics of Climate Change from Cambridge University, UK

Detailed CV

Name of Firm:	Camco Advisory Services (K) Ltd (formerly Energy for Sustainable Development Africa Ltd (ESDA)		
Name of Staff:	Stephen Ndore Mutimba		
Profession:	Climate Change, Renewable Energy and Forestry Specialist		
Date of Birth:	9th March 1965		
Years With Firm	12 Years	**Nationality**	Kenyan
Membership in Professional Societies:	- East Africa Wildlife Society - Kenya Forest Working Group - Kenya Forest Society - Kenya Renewable Energy Association (KEREA) - Solar Energy Network (SolarNet) - East Africa Energy Training and Development Network (EAETDN)		

Key Qualifications:

- Policy and institutional development processes, business development,
- Fund mobilization, project design and management
- Climate change policy, Kyoto Mechanism and voluntary market
- Leading interdisciplinary teams involved in design, appraisals and reviews of projects and programs
- Project Design, Development and Management
- Land Use and land use change and forestry projects
- Carbon finance projects development

▪ Biomass and Charcoal specialist

Education:	**MSc**, Forestry and Its Relation to Land-Use. Thesis on Carbon sequestration potential of Marginal Lands, Oxford University, Oxford, UK, 1996 **BSc**, (Botany and Zoology), Kenyatta University, Nairobi, Kenya, 1986 to 1989.
Other Training:	Certificate, **Economics of Climate Change, Cambridge University, Cambridge, UK, 2008** Certificate Plant Biotechnology, Colorado State University, Fort Collins, USA, 1992.

Detailed Tasks Assigned **February 2013 to date**	***1.1.1.1 Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned*** ***1.1.1.2*** ***Project Director*:** Review of policies and regulations on charcoal and how to promote a systems wide approach to sustainable charcoal production and use in Malawi (Client: UNDP) ***Project Description:*** This present study was initiated by the government of Malawi. The purpose is to review the charcoal production chain at policy and practice level while adopting a systems- wide approach for sustainable charcoal. Study activities include examining and review of policies and regulations relevant to charcoal production, marketing, and taxation. Identification of policy gaps and contradictions of all existing policies and identification of options that can modernize the industry. Also, proposing guiding principles and approaches to be followed to achieve compliance with sustainable charcoal production and enforcement mechanisms at all levels.
September 2012 to date	***Project Director:*** Preparation of a UNDP/GEF compliant full scale program (Client: UNDP Uganda) ***Project Description:*** The objective of this project is to enhance the charcoal industry in key charcoal producing areas in Uganda. The consultancy entails preparation of a UNDP/GEF compliant FSP and addressing barriers to adaptation of improved charcoal technologies and sustainable land management practices through an integrated approach. The project also involves a detailed assessment of the applicability, efficacy and operational arrangements for deployment of the proposed biomass energy technologies and sustainable forestry management schemes in Uganda Facilitated Comprehensive Climate Change Planning Learning Event for Private Sector in Global Best Practice, Windhoek, Namibia funded by Dfid and World Bank
November 2012 – date	***Project Director:*** Scaling up fuel efficient technologies for domestic, institutional, and industrial use with carbon benefits in the Kilimanjaro region (Client: UNDP Tanzania) ***Project Description:*** The purpose of this study is to examine the role of energy in land and forest degradation and deforestation, and to identify systemic ways to improve the efficiency of energy systems in order to reduce the negative impact if its use to livelihoods and the environment. The outcome will be the design of an energy improvement strategy for the Kilimanjaro region whose implementation will lead to emissions reduction linked to a carbon credit earning scheme, preferably through the UNDP MDG Carbon initiative and other carbon market schemes.
April 2011 - date	***Project Manager*:** Capacity building in clean development mechanism and project development (Client: The Belgian Government through the Belgian Development Agency)

	Project Description: The Belgian government funded a multi-institutional and multi-disciplinary project which has involved training private sector, government and NGO personnel to design innovative green-house reduction projects. The project involved assisting in the development of the work plan, management of two international technical advisors and one national project officer who are involved in PIN, PDD, and CDM projects.
January 2010- December 2012	***Project Director*****:** Dissemination of improved carbonization techniques and reorganization of charcoal supply chain in Rwanda (Client: Government of Rwanda) ***Project Description***: The goal of this project was to improve the production of charcoal in line with Rwanda's Vision 2020. The objective was to introduce sustainable charcoal carbonization techniques in four pilot districts in Western Rwanda, training charcoal producers of charcoal feedstock propagation and regeneration, and improve the marketing of charcoal by organizing producers into cooperatives. Part of this involved working with government and regulators to develop certification standards and branding for eco-charcoal.
October 2011- December 2011	***Project Director:*** Sustainable charcoal working session (Client: UNDP) ***Project Description:*** This was a three day sustainable charcoal tour in Rwanda with the intention of providing decision makers with a framework for sustainable charcoal production and consumption using the system-wide approach; also to build capacity of decision makers, especially the DNAs and the public sector on sustainable charcoal with a carbon financing potential. The project also sought to review and facilitate the role of regional economic communities (EAC, ECOWAS, and SADC) to support sustainable charcoal practices at the national level as well as to meet established regional energy access targets.
2010 - 2011	***Team Leader*****:** Developing sustainable charcoal programmes in sub Saharan Africa (Client: **:** UNEP Division of Global Environment Facility Coordination ,UNEP – GEF) **Project Description:** Managed the development of project identification form (PIF) and project preparatory grant (PPG) in six countries within the region. Duties entailed communication and supervision of in-country technical consultants involved in collecting and compiling information on policy and institutional framework on charcoal.
2010 - 2011	***Project Manager***: East African Community (EAC) Climate Change Master Plan *Project Description:* The purpose of the Master Plan was to provide a long-term vision and a basis for Partner States to operationalize a comprehensive framework for adapting to and mitigating climate change in the EAC region in line with the EAC protocol on environment and natural resources management and with international climate change agreements. The study was commissioned by the East African Community Secretariat.
2008 - 2009	***Project Director*****:** Pilot the implementation of new charcoal policy in five districts in Kenya (Client: UNDP GEF and GoK) ***Project Description:*** The project strategy was to pilot the use of sustainable charcoal as a tool for improved woodland management by creating an enabling environment (policies, markets, technologies and governance) in five districts to test its viability as a tool for sustainable land management for the benefit of the people and the environment. Stephen provided technical assistance in the project on behalf of UNDP GEF, and the government of Kenya.
2007	***Project Manager:*** Enhancement of policy and institutional framework for sustainable charcoal production in Kenya project (Client: Department of International Development-Kenya) ***Project description:*** Carried out a national charcoal value chain survey covering 24

	representative districts and involving over 4,000 interviews with charcoal producers, transporters and vendors in rural and urban areas. Information collected directed the development of the current charcoal rules and regulations enacted under the Forest Act
2006	***Project Director*****:** Developing markets for eco-charcoal in Dodoma and Morogoro regions of Tanzania (Client: Rural Livelihood Development Programme) **Project description:** Worked among poor rural charcoal making communities to improve their livelihoods by enhancing traditional charcoal making practices through better kiln technology, training on tree husbandry and proper marketing of their product. This project aimed at improving income streams among the beneficiaries while conserving the environment
2006 - 2007	***Technical Advisor***: Sustainable Charcoal Production in N.E. Turkana District Associated with Emergency for Work Cash Programming Clinet : OXFAM GB ***Project Description:*** Developed a sustainable charcoal production and marketing model within North East Turkana district (Kenya) to assist a community in Lokitaung division improve their livelihood. The purpose of the project was to increase Turkana community's access to income through the development of market opportunities for sustainably produced charcoal (eco-charcoal).

Employment Record:	
Date: *(m/yr-m/yr)*	**2001 – present**
Location:	Nairobi, Kenya
Company:	Camco Advisory Services (K) Ltd
Position:	Managing Director

Date: *(m/yr-m/yr)*	**1999 to 2000**
Location:	Nairobi, Kenya
Company:	Environment and Natural Resources ROYAL NETHERLANDS EMBASSY,
Position:	Programme Officer,

Date: *(m/yr-m/yr)*	**1998 to 1999**
Location:	Nairobi Kenya
Company:	African Centre for Technology Studies (ACTS)
Position:	Research Fellow

Date: *(m/yr-m/yr)*	**1990 to 1994**
Location:	KENYA
Company:	Kenya Forestry Research Institute (KEFRI)
Position:	Research Officer

Other relevant information (Publications):

- Mutimba S. and Wanyoike R. 2013: Towards a Coherent and Cost-efficient Policy Response to Climate Change in Kenya.
- Mutimba S. 2012: Sustainable Development in Kenya: Stocktaking in the run up to Rio+20 Draft Publication for Ministry of Environment & Mineral Resources & UNDP.
- Mutimba S. et al: East Africa Community Climate Change Master Plan for EAC Secretariat).
- Mutimba *et al (2010)*: Climate Change Vulnerability and Adaptation Preparedness in Kenya. Heinrich Boll Stiftung, East and Horn of Africa.
- Mutimba S. (2010): Climate Change in Africa: Post COP15 Reflections; Programme for Sustainable Leadership, University of Cambridge.
- Mutimba S. and Barasa, (2005): Kenya Energy Atlas, UNDP.
- Mutimba, S. and Barasa, M. (2005). National Charcoal Survey: Exploring the potential for a sustainable charcoal industry in Kenya. Nairobi, Energy for Sustainable Development – Africa.
- National Climate Change Response Strategy for Zambia. Commissioned by the Government of the Republic of Zambia and UNDP through the Ministry of Tourism, Environment and Natural Resources. 2010/2011.
- The dilemma of short and long term trade-offs between biofuel production and food security in Africa. A discussion paper presented at the 5th Africa Agriculture Science Week and FARA General Assembly. 23rd July 2010.
- Formulation of a National Climate Change Response Strategy for Kenya. Commissioned by the Ministry of Environment and Mineral Resources of the government of Kenya. April 2010.
- Mapping Food and Bioenergy Country Reports for Kenya, Tanzania and Mozambique. An initiative of COMPETE - Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems – Africa. 2010.
- Analysis of Opportunities for Biofuel Production in Sub-Saharan Africa. A paper commissioned by CIFOR – Centre for International Forest Research. October 2008.
- Climate Change Impacts on Communities in Kenya: Case Studies commissioned by Oxfam Kenya Office. June 2008.
- A Roadmap for Biofuels in Kenya: Opportunities and Obstacles. A study commissioned by GTZ and the Government of Kenya Ministry of Agriculture. May 2008.
- PANERECC – parliamentary Network on Renewable Energy and Climate Change. Policy Briefs No.s 1-3. 2008/2009.
- Charcoal Policy Briefs commissioned by the Government of Kenya and DFID (UK) through the Ministry of Energy. 2005.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Annex 7. UNEP Evaluation Report Quality Assessment

Evaluation Report Title:

Terminal Evaluation of the UNEP/GEF project on "Greening the Tea Industry in East Africa" (GFL-2328-2721-4981)

All UNEP evaluation reports are subject to a quality assessment by the Evaluation Office. The quality assessment is used as a tool for providing structured feedback to the evaluation consultants. The quality of both the draft and final evaluation report is assessed and rated against the following criteria:

Substantive report quality criteria	UNEP EO Comments	Draft Report Rating	Final Report Rating
A. Strategic relevance: *Does the report present a well-reasoned, complete and evidence-based assessment of strategic relevance of the intervention?*	Draft report: Relevance has been adequately addressed, but could be further strengthened by a more detailed assessment of country-specific relevance. Final report: As above	5	5
B. Achievement of outputs: *Does the report present a well-reasoned, complete and evidence-based assessment of outputs delivered by the intervention (including their quality)?*	Draft report: The section could be further strengthened by a more detailed assessment of the quality and usefulness of the delivered outputs and more clarity on what was the status of delivered vs. planned outputs. Final report: Assessment of achievement of outputs was strengthened as requested	4	5
C. Presentation Theory of Change: Is the Theory of Change of the intervention clearly presented? Are causal pathways logical and complete (including drivers, assumptions and key actors)?	Draft report: The identified causal pathways are complete up to the intermediate state level but contribution to the different levels of objectives could be further clarified. Final report: As above	4	4
D. Effectiveness - Attainment of project objectives and results: Does the report present a well-reasoned, complete and evidence-based assessment of the achievement of the relevant outcomes and project objectives?	Draft report: The section on attainment of objectives and results is well drafted. Final report: As above	5	5
E. Sustainability and replication: Does the report present a well-reasoned and evidence-based assessment of sustainability of outcomes and replication / catalytic effects?	Draft report: Sustainability and replication have been quite thoroughly discussed. Final report: As above	5	5
F. Efficiency: Does the report present a well-reasoned, complete and evidence-based assessment of efficiency?	Draft report: Efficiency has been adequately discussed. It could be strengthened by further considering possible cost-or time saving efforts. Final report: As above	5	5
G. Factors affecting project performance: Does the	Draft report: Assessment of factors	5	5

report present a well-reasoned, complete and evidence-based assessment of all factors affecting project performance? In particular, does the report include the actual project costs (total and per activity) and actual co-financing used; and an assessment of the quality of the project M&E system and its use for project management?	affecting project performance is well-reasoned and evidence-based. Final report: As above		
H. Quality and utility of the recommendations: Are recommendations based on explicit evaluation findings? Do recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?)'. Can they be implemented?	Draft report: Recommendations are based on evaluation findings, but they could be clearer in terms of who should do what. Recommendations should be implementable by the project. Final report: As above	4	4
I. Quality and utility of the lessons: Are lessons based on explicit evaluation findings? Do they suggest prescriptive action? Do they specify in which contexts they are applicable?	Draft report: Lessons are based on evaluation findings, but they could be strengthened by being more explicit regarding the prescriptive action. Final report: As above	4	4
Other report quality criteria			
J. Structure and clarity of the report: Does the report structure follow EO guidelines? Are all requested Annexes included?	Draft report: The report follows EO guidelines well and is well structured. Final report: As above	**6**	**6**
K. Evaluation methods and information sources: Are evaluation methods and information sources clearly described? Are data collection methods, the triangulation / verification approach, details of stakeholder consultations provided? Are the limitations of evaluation methods and information sources described?	Draft report: Methods and information sources have been adequately described. Final report: As above	**5**	**5**
L. Quality of writing: Was the report well written? (clear English language and grammar)	Draft report: Report was well written Final report: As above	5	5
M. Report formatting: Does the report follow EO guidelines using headings, numbered paragraphs etc.	Draft report: Report formatting followed EO guidelines Final report: As above	6	6
	OVERALL REPORT QUALITY RATING	5.50	5.50

Rating system for quality of evaluation reports

A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1

The overall quality of the evaluation report is calculated by taking the mean score of all rated quality criteria.

Checklist of compliance with UNEP EO's normal operating procedures for the evaluation process

Compliance issue	Yes	No
1. Were the TORs shared with the implementing and executing agencies for comment prior to finalization?	x	
2. Was the budget for the evaluation agreed and approved by the UNEP Evaluation Office?	x	
3. Was the final selection of the preferred evaluator or evaluators made by the UNEP Evaluation Office?	x	
4. Were possible conflicts of interest of the selected evaluator(s) appraised? (Evaluators should not have participated substantively during project preparation and/or implementation and should have no conflict of interest with any proposed follow-up phases)	x	
5. Was an inception report delivered before commencing any travel in connection with the evaluation?	x	
6. Were formal written comments on the inception report prepared by the UNEP Evaluation Office and shared with the consultant?	x	
7. If a terminal evaluation; was it initiated within the period six months before or after project completion? If a mid-term evaluation; was the mid-term evaluation initiated within a six month period prior to the project/programmes's mid-point?	x	
8. Was the draft evaluation report sent directly to EO by the evaluator?	x	
9. Did UNEP Evaluation Office check the quality of the draft report, including EO peer review, prior to dissemination to stakeholders for comment?	x	
10. Did UNEP Evaluation Office disseminate (or authorize dissemination) of the draft report to key stakeholders to solicit formal comments?	x	
11. Did UNEP Evaluation Office complete an assessment of the quality of the draft evaluation report?	x	
12. Were formal written stakeholder comments sent directly to the UNEP Evaluation Office?	x	
13. Were all collated stakeholder comments and the UNEP Evaluation Office guidance to the evaluator shared with all evaluation stakeholders?	x	
14. Did UNEP Evaluation Office complete an assessment of the quality of the final report?	x	
15. Was an implementation plan for the evaluation recommendations prepared?	x	