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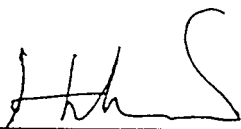
1. S/W及びM/M

(1) S/W (19th March, 1997)

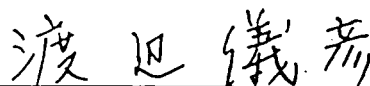
SCOPE OF WORK
FOR
THE STUDY
ON
THE RESERVE FOREST-MANAGEMENT IN TRANSITIONAL ZONE
IN
GHANA

AGREED UPON BETWEEN
MINISTRY OF LANDS AND FORESTRY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Accra, 19 March, 1997



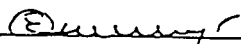
Mrs. Agnes M. Batsa
Head
Bilateral Unit
International Economic Relations Division
Ministry of Finance
Ghana



Mr. Yoshihiko Watanabe
Team Leader
Preparatory Study Team
Japan International Cooperation Agency
Japan



Mr. E. Siisi-Wilson
Deputy Technical Director
Ministry of Lands and Forestry
Ghana



Mr. Edward Osei Nsenkyire
Chief Conservator of Forests
Forestry Department
Ministry of Lands and Forestry
Ghana

I. INTRODUCTION

In response to the request of the Government of the Republic of Ghana (hereinafter referred to as "the Government of Ghana"), the Government of Japan has decided to conduct the study on the Reserve Forest Management in Transitional Zone in Ghana (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Ghana.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

1. To develop and conduct a feasibility study on Forest Management Plan for degraded areas inside five forest reserves in transitional zone, and
2. To transfer technology in the course of the Study to the Ghanaian counterpart personnel.

III. SCOPE OF THE STUDY

1. Study Area (See the location map attached as Annex I)

Transitional zone with a total area of approximately 300,000 ha, including five forest reserves (i.e. Sawsaw, Nsemre, Yaya, Tain I and Tain II).

2. Intensive Study Area (See the location map attached as Annex I)

Degraded forest sites with a total area of approximately 30,000 ha in the five forest reserves (whole area of Sawsaw, Nsemre, Yaya and Tain I and a part of Tain II).

3. Outline of the Study

The study will consist of the following two phases. Work plans in each phase are as follows.

Work in Phase I

- (1) Aerial photographing in the Study Area (scale : 1/20,000).
- (2) Collection and analysis of general information on the Study Area.
 - a) Natural condition
 - b) Socio-economic condition
- (3) Preparation of land-use and vegetation map for the Study Area (scale : 1/50,000).

Work in Phase II

- (1) Preparation of topographic maps for the five forest reserves (scale : 1/25,000).
- (2) Preparation of forest stand maps for the five forest reserves (scale : 1/25,000).
- (3) Collection and analysis of the data and information through a field survey on the following items in the Intensive Study Area
 - (a) Natural condition
 - (b) Socio-economic condition
- (4) Preparation of soil maps for the Intensive Study Area (scale : 1/25,000).
- (5) Preparation of Forest Management Plan including forest restoration, fire control and local involvement.
- (6) Assessments of the feasibility of the Forest Management Plan.
- (7) Preparation of Forest Management Maps for the Intensive Study Area (scale : 1/25,000).
- (8) Preparation of Forest Management Guidelines for forest reserves in transitional zone.

IV. WORK SCHEDULE

The Study will be carried out in accordance with the attached tentative work schedule. (Annex-II).

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Ghana.

1. Inception Report
Twenty (20) copies at the beginning of phase I of the Study.
2. Progress Report
Twenty (20) copies at the beginning of phase II of the Study.
3. Interim Report
Twenty (20) copies at the middle of phase II of the Study.
4. Draft Final Report
Twenty (20) copies at the later of phase II of the Study. The Government of Ghana will provide JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report.
5. Final Report
Fifty (50) copies within two (2) months after receipt of the comments from the Government of Ghana on the Draft Final Report.

In addition to the above reports, one set each of the following are to be submitted to the Government of Ghana with relevant reports.

- (1) Aerial photographs of the Study Area (scale : 1/20,000; 1 set).
 - (a) Negative films
 - (b) Contact prints
- (2) Maps :
 - (a) Study Area
 - a) Land-use and vegetation map for the Study Area (scale : 1/50,000; 1set of original, 2sets of copy).
 - (b) Forest reserves
 - a) Topographic maps for the five forest reserves (scale : 1/25,000; 1set of original, 2sets of copy).
 - b) Forest stand maps for the five forest reserves (scale : 1/25,000; 1set of original, 2sets of copy).
 - (c) Intensive Study Area
 - a) Forest Management Maps for the Intensive Study Area (scale : 1/25,000; 1set of original, 2sets of copy).
 - b) Soil maps for the Intensive Study Area (scale : 1/25,000; 1set of original, 2sets of copy).

VI. UNDERTAKING OF THE GOVERNMENT OF GHANA

1. In order to facilitate the smooth conduct of the Study, the Government of Ghana shall take necessary measures :
 - (1) to secure the safety of the Japanese study team,
 - (2) to permit the members of the Japanese study team to enter, leave and sojourn in Ghana for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
 - (3) to exempt the members of the Japanese study team from taxes, duties and other charges on equipment, machinery and other materials brought into Ghana for the conduct of the Study,
 - (4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study,
 - (5) to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into Ghana from Japan in connection with the implementation of the Study,
 - (6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,
 - (7) to secure permission for the Japanese study team to take all data and documents

(including maps and photographs) related to the Study out of Ghana to Japan; and

(8) to provide medical services as needed. Its expenses will be chargeable to members of the Japanese study team.

2. The Government of Ghana shall bear claims, if any arise against members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.
3. Ministry of Lands and Forestry are to be responsible for the overall management and the implementation of the Study, and shall act as a coordinating body in relation to other relevant Ghana authorities for the smooth implementation of the study.
4. Forestry Department shall act as a counterpart agency to the Japanese study team during the implementation of the Study.
5. Forestry Department shall, at its own expense, provide the Japanese study team with the following, in cooperation with other organizations concerned:
 - (1) available data and information related to the Study,
 - (2) counterpart personnel,
 - (3) suitable office spaces with necessary equipment in (Kumasi or Sunyani), and
 - (4) credentials or identification cards.

VII. UNDERTAKING OF JICA

For the implementation of the study, JICA shall take the following measures;

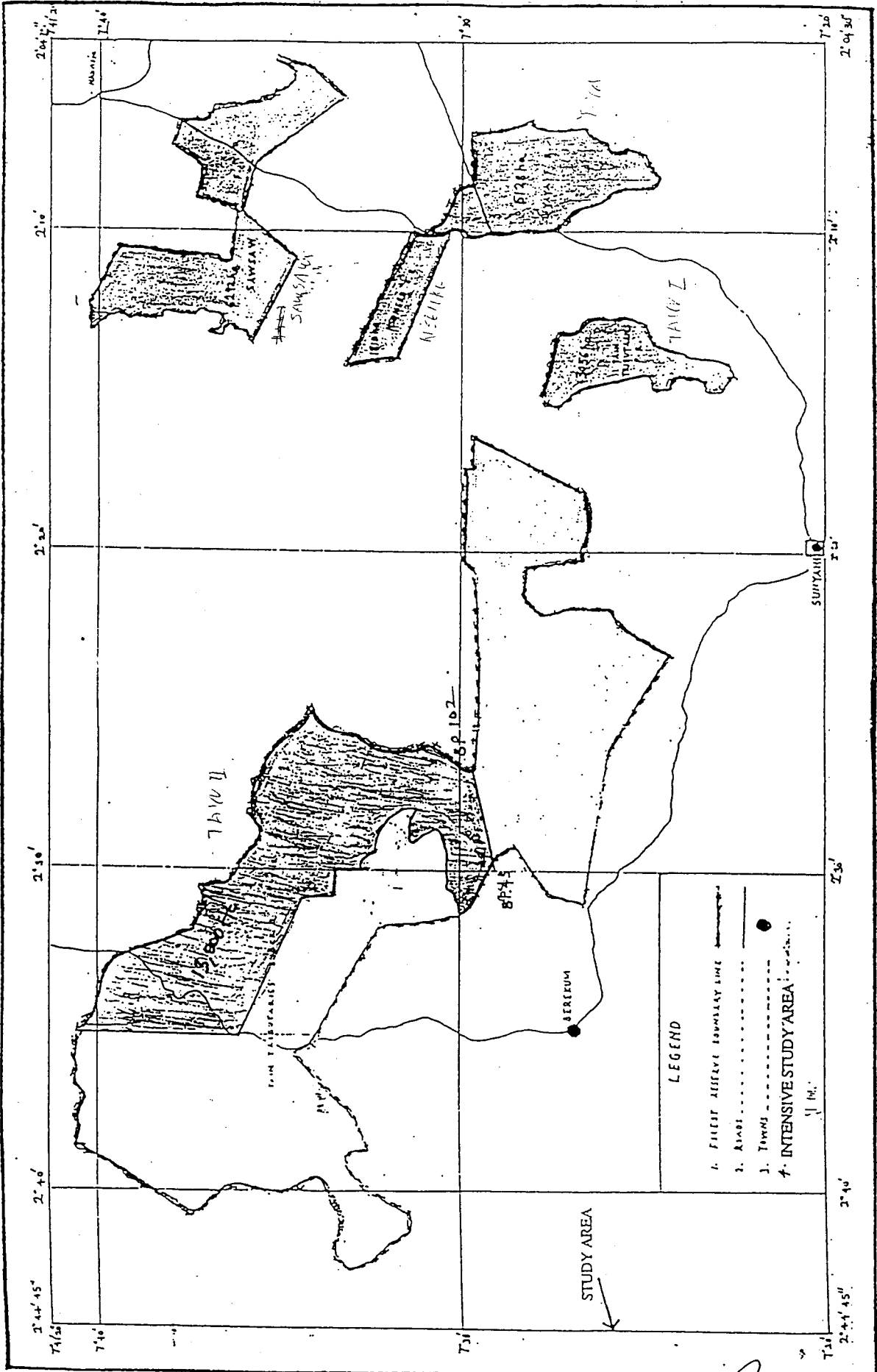
- (1) To dispatch, at its own expense, the Study Teams to Ghana, and
- (2) To pursue technology transfer to the Ghanaian counterpart personnel in the course of the Study.

VIII. OTHERS

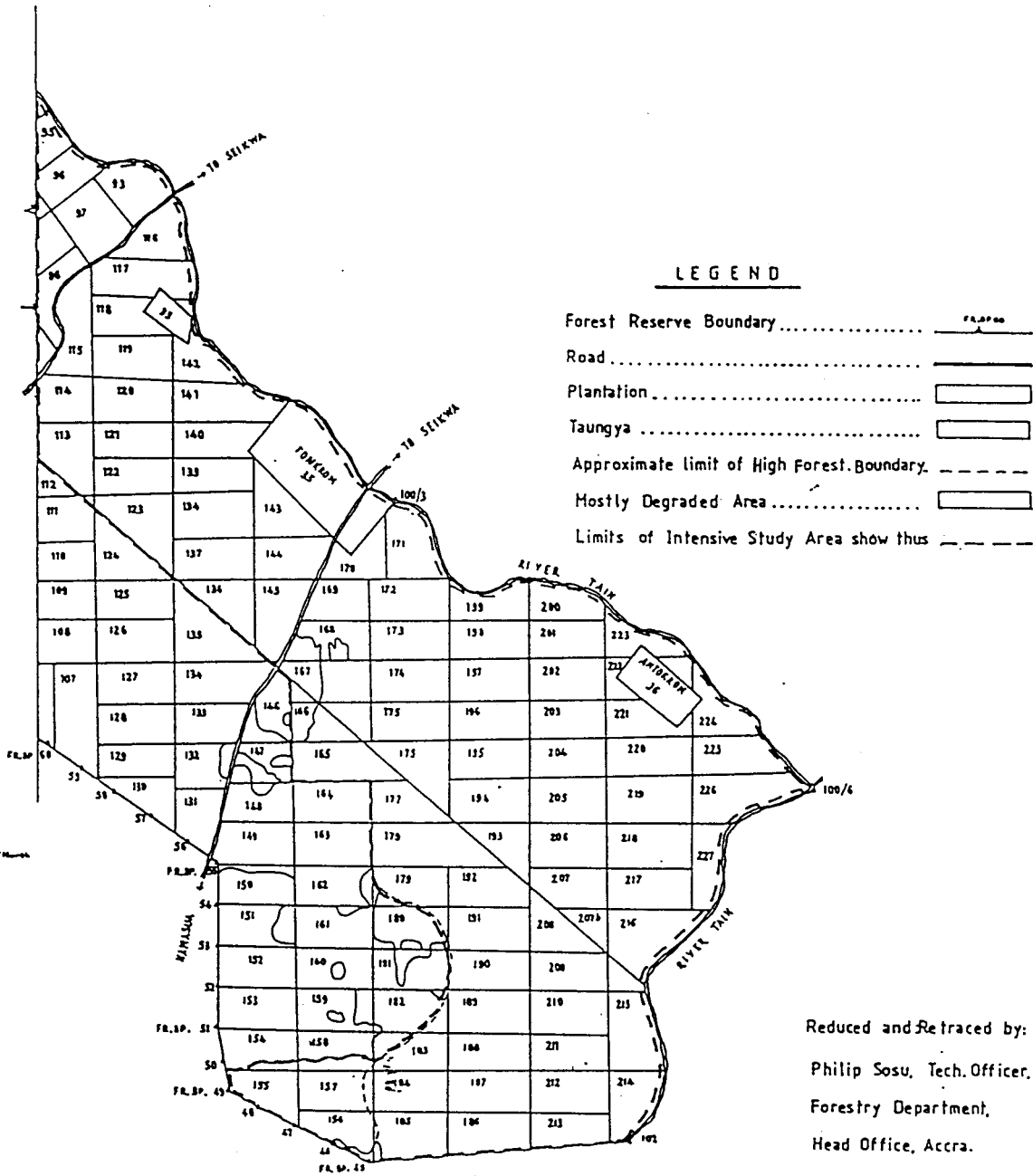
JICA and Ministry of Lands and Forestry shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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TAIN BLOCK II FOREST RESERVE PROGRESS MAP



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TENTATIVE SCHEDULE

Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
The Study in Ghana																								
The Study in Japan																								
Reports		△							△						△					△				△
		IC/R							PR/R						IT/R					DF/R				F/R
Phase	Phase I										Phase II													

- (Remarks)
- IC/R : Inception Report
 - PR/R : Progress Report
 - IT/R : Interim Report
 - DF/R : Draft Final Report
 - F/R : Final Report

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- (2) Minutes of Meeting (M/M)
① M/M (19th March, 1997)

MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE STUDY
ON
THE RESERVE FOREST MANAGEMENT IN TRANSITIONAL ZONE
IN
GHANA

The preparatory study team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Yoshihiko Watanabe, visited the Republic of Ghana from March 10 to 20, 1997 for the purpose of discussing and confirming the Scope of Work for the Study on the Reserve Forest Management in Transitional Zone in Ghana (hereinafter referred to as "the Study").

The Team had a series of discussions with officials of the Ministry of Lands and Forestry and the Forestry Department (hereinafter referred to as "FD") on the Scope of Work for the Study.

As a result of the discussions, FD and the Team agreed upon the Scope of Work for the Study.

The main issues discussed by the both sides in relation to the Scope of Work for the Study are shown in the Annex as attached hereto.

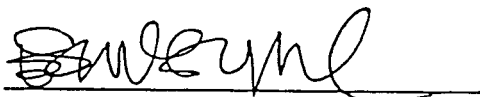
Accra, 19 March, 1997



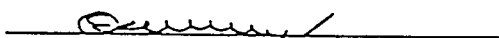
Mrs. Agnes M. Batsa
Head
Bilateral Unit
International Economic Relations Division
Ministry of Finance
Ghana



Mr. Yoshihiko Watanabe
Team Leader
Preparatory Study Team
Japan International Cooperation Agency
Japan



Mr. E. Siisi-Wilson
Deputy Technical Director
Ministry of Lands and Forestry
Ghana



Mr. Edward Osei Nsenkyire
Chief Conservator of Forests
Forestry Department
Ministry of Lands and Forestry
Ghana

The following are the main issues discussed in relation to the Scope of Work for the Study:

1. Both sides agreed that FD Headquarters should be responsible for the Study and liaison with related organizations.
2. The Ministry of Lands and Forestry promised that after reforming FD, the Forest Service shall be the responsible body for the Study.
3. Both sides agreed that the comments of the Planning Branch should be given consideration through discussion with FD during the implementation of the Study.
4. Both sides agreed that the Intensive Study Area of TAIN II has been changed from Nsuatre-Odumasi Portion to Berékum-Namasua Portion of the reserve according to the field survey.
5. Both sides agreed that the Study should include a technology transfer seminar at the stage of explanation of the Draft Final Report to disseminate the results of the Study. The seminar is to be jointly organized by the Ghanaian side and the Japanese study team.
6. FD requested JICA through the Team to consider setting up necessary equipment for conducting the Study such as:
 - four-wheel drive vehicle(s)
 - photocopy machine(s)
 - personal computer(s)
 - transceiver(s)
 - other relevant equipment

The team promised to convey ~~the~~ request to the Government of Japan.

7. FD promised to provide the counterpart personnel to undertake the implementation of the Study in such areas as:

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- Silviculture
 - Rural forestry
 - Vegetation Survey
 - Soils
 - Social-economic analysis
 - Environment
 - Aerial photography/land survey
8. FD requested for counterpart training in Japan, and the area of training should be related to the Study. The Team promised to convey the request to the Government of Japan.
9. FD requested that the work schedule should be reviewed to facilitate the local training of the counterpart staff.

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② M/M (16th October, 1997)

MINUTES OF MEETINGS
ON
THE INCEPTION REPORT
OF
THE STUDY
ON
THE RESERVE FOREST MANAGEMENT IN TRANSITIONAL ZONE
IN
GHANA

ACCRA, 16th OCTOBER, 1997

FORESTRY DEPARTMENT
MINISTRY OF LANDS AND FORESTRY
GHANA

JICA STUDY TEAM


Mr. EDWARD OSEI NSENKYIRE
CHIEF CONSERVATOR OF FORESTS


Mr. SHINJI TANABE
TEAM LEADER

WITNESSED BY
JICA ADVISORY TEAM


Mr. YOSHIHIKO WATANABE
TEAM LEADER

In pursuance of the objective of the Scope of Work for the Study on the Reserve Forest Management in Transitional Zone (hereinafter referred to as "the Study") signed on the 19th of March, 1997, Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team headed by Mr. Shinji Tanabe and the Advisory Team headed by Mr. Yoshihiko Watanabe, from the 8th to 17th of October, 1997.

The Study Team held the series of discussions with the Ghanaian authorities and counterparts headed by Mr. E.O. Nsenkyire, Chief Conservator of Forests of Forestry Department, the Ministry of Lands and Forestry (hereinafter referred to as "FD") from the 9th to 15th of October, 1997. The both sides agreed upon the following items:

1. The Study Team submitted twenty (20) copies of Inception Report (IC/R) to FD. FD accepted them with the following confirmation:
 - (1) The phrase in line 6-7, page 3 of IC/R, "while the rights of commercial exploitation of trees are reserved by the national government" should read "while the rights of commercial exploitation of trees are vested in the State".
 - (2) A phrase: "in accordance with the laws of Ghana" should be added at the end of the sentence in line 10-11, page 28 of IC/R.
2. FD suggested that the Study Team should take into account the information from the Environment Protection Agency at the time of conducting the Initial Environmental Examination (IEE). Both sides agreed upon the importance of environmental consideration in establishing the Forest Management Plan.

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ANNEX

LIST OF ATTENDANTS

FORESTRY DEPARTMENT

1. Mr. E.O. Nsenkyire	Chief Conservator of Forests	Forestry Department
2. Mr. A.S.K. Boachie-Dapaah	Deputy Chief Conservator of Forests	- ditto -
3. Mr. Twum Boateng	Plantations Officer	- ditto -
4. Mr. J.F. Anane	Socio-Economist	- ditto -
5. Mr. Oheneba A. Agyemang	Senior Conservator of Forests (Project Coordinator)	- ditto -
6. Mr. Maurice Nakaar	Principal Conservator of Forests	- ditto -
7. Mr. A.A. Ziblim	Regional Forestry Officer, Brong Ahafo	- ditto -

MINISTRY OF FINANCE

1. Mr. Kwasi Opoku	Desk Officer	International Economic Relations Division
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JICA STUDY TEAM

1. Mr. Shinji TANABE	Team Leader	JICA Study Team
2. Ms. Yasuko MATSUMI	Forest Management Plan	- ditto -
3. Mr. Hiromitsu KUNO	Social/Gender Analysis	- ditto -
4. Mr. Tetsuya OHTSUKI	Natural Conservation/Environment	- ditto -
5. Mr. Hideaki SAKAI	Aerial Photography/Survey Supervision Coordinator	- ditto -

JICA ADVISORY TEAM

1. Mr. Yoshihiko WATANABE	General Supervision	Director, Kyushu Tree Breeding Institute, Forestry Agency of Japan
2. Mr. Motofumi KOHARA		Director, Forestry and Fisheries Development Study Div., JICA Head Office
3. Dr. Takaaki KOMAKI	Social Forestry	Chief, Forest Management and Economics Laboratory, Hokkaido Research Center, Forestry and Forest Products Research Institute

JICA

1. Mr. Christopher Nnoyel	Programme Officer	JICA Ghana Office
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③ M/M (18th June, 1998)

**MINUTES OF MEETING
FOR
THE STUDY ON THE RESERVE FOREST MANAGEMENT
IN TRANSITIONAL ZONE IN GHANA**

In pursuance of the Scope of Work of the Study on the Reserve Forest Management in Transitional Zone in Ghana (hereinafter referred to as "the Study") signed on March 19, 1997. Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team to Ghana.

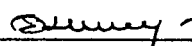
The Study Team headed by Mr. Shinji Tanabe, visited Ghana from June 10 to July 16, 1998, explained to and had series of discussions with the responsible officials headed by Mr. E. O. Nsenkyire, Chief Conservator of Forests, Forestry Department, Ministry of Lands and Forestry (hereinafter referred to as "FD") on the Progress Report of the Study.

The salient results of the discussions were as follows.

1. The Study Team submitted twenty (20) copies of Progress Report (PR/R) to FD. The FD side agreed in principle upon the contents of the Progress Report.
2. The discussed and agreed issues on the discussion of PR/R are as stated in the attachment.

The said issues were discussed and agreed upon by the FD and the Study Team in relation to the Study.

Accra, June 18, 1998



Mr. Edward Osei Nsenkyire
Chief Conservator of Forests
Forestry Department
Ministry of Lands and Forestry
Ghana



Shinji Tanabe
Team Leader
JICA Study Team

WITNESSED BY



Tetsuya Kamijo
Coordinator
JICA Advisory Team

Attachment

1. The demarcation of the Forest Reserves and the Intensive Study Area should be based on the aerial photos newly prepared by the JICA Study Team.
2. The compartmentalization shall be made to accommodate for planned activities regardless of the existing forest division standard.
3. The FD shall have the role in the plan implementation to mastermind and conduct the collaborative forest management through enhancing the participation of the private sector and local people.
4. In the Forest Reserves, Taungya system and other agroforestry approaches as well as firewood production shall be considered as necessary ones in the planned activities based on the needs of local people.
5. There was a request from the Ghanaian side to shorten the rotation age. The due consideration shall be paid in the planning with the reliable materials such as yield tables provided by the Ghanaian side.
6. There was a request from the Ghanaian side to adopt timber species including fast-growing species and indigenous species apart from the teak. The species selection shall be made by taking into account the needs of local people and the reliable materials provided by the Ghanaian side.
7. The existing plantation shall be included in the calculation of benefits in order to assess the feasibility of the project.
8. Targets of forest management plan should be reorganised to include protection of the forest, increased production of timber, firewood, NTFPs and agricultural produce to meet people's needs.
9. The forestry staff should be given education and training in planned activities to reform their attitude in working with the local people.
10. To organise the local people for the implementation of the plan, there is the need of development of the capacity of the local people.
11. Direct/Tangible benefits shall be calculated for the cost benefit analysis. Such direct benefits include timber, poles, firewood, NTFPs and agricultural produce. Indirect/Intangible benefits derived from the forest/plantation shall not be calculated but considered. The beneficial subject will be the manifestation of various effects of the forest/plantation on the environment, e.g. climate, soil and water, etc.

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for

**MINUTES OF MEETING
FOR
THE STUDY ON THE RESERVE FOREST MANAGEMENT
IN TRANSITIONAL ZONE IN GHANA**

in pursuance of the Scope of Work of the Study on the Reserve Forest Management in Transitional Zone in Ghana (hereinafter referred to as "the Study") signed on March 19, 1997. Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team to Ghana.

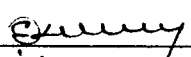
The Study Team headed by Mr. Shinji Tanabe, visited Ghana from February 16, to March 19, 1999, explained to and had series of discussions with the responsible officials headed by Mr. E. O. Nsenkyire, Chief Conservator of Forests, Forestry Department, Ministry of Lands and Forestry (hereinafter referred to as "FD") on the Interim Report of the Study.

The salient results of the discussions were as follows.

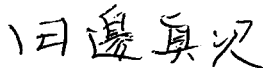
1. The Study Team submitted twenty (20) copies of Interim Report (IT/R) to FD. The FD side agreed in principle upon the contents of the Interim Report.
2. The discussed and agreed issues on the discussion of IT/R were described as in the attachment.

The said issues were discussed and agreed upon by the FD and the Study Team in relation to the Study.

Accra, February 25, 1999



Mr. Edward Osei Nsenkyire
Chief Conservator of Forests
Forestry Department
Ministry of Lands and Forestry
Ghana



Shinji Tanabe
Team Leader
JICA Study Team

WITNESSED BY



Takaaki Komaki
Social Forestry
JICA Advisory Team

Attachment

Industrial Plantation

1. It was reconfirmed that the mixing ratio of teak and ofram in industrial plantation should be teak 80% and ofram 20 % taking into consideration the site condition of the Intensive Study Area.
2. It was reconfirmed that thinning in industrial plantation should be done in accordance with the Silvicultural Regime presented by the Planning Branch, Forestry Department.
3. The period of taungya system shall be four(4) years, ~~just after the first thinning in addition to four(4) years at the initial stage, resulting in eight(8) years in total.~~
4. It was reconfirmed that the final cutting age of Teak should be thirty-five(35) years.
5. Heavy machinery such as bulldozer with ripper shall be used for land preparation in the appropriate portion of the industrial plantation.
6. It will be studied in the field survey that the seedlings of teak shall be raised bare-root and stumped for planting out in the field.

Green Firebelt

7. It was reconfirmed that the width of green fire belt is forty(40) m inside the Forest Reserve and fruit trees can be grown in the green fire belt.
8. The tree species to be planted and the agricultural crops to be cultivated in the green fire belt are as follows.
Fruit-tree species : avocado, mango, cashew, orange and sugar-apple
Agricultural crops : maize, cocoyam, plantain and yam.
9. The extension of Green Firebelt into the area along the appropriate block boundaries in the Forest Reserve will be planned from the viewpoint of fire control, people's livelihood and cost reduction of forest roads.

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10. Tree-fallow technology shall be adopted instead of Alley cropping.
11. Forestry Department shall not supply farmers with seeds of fruit trees for their own use.

General

12. Seedlings shall be produced once a year and should be ready for planting out in May to July
13. The introduction of profit-sharing rights between farmers and private companies or Forest Department regarding trees for final cutting shall be confirmed and the profit-sharing rate shall be studied by Forestry Department.
- 14.. Forestry Department shall provide assistance in the establishment of Forest Management and Planning Committees in the villages in the Study Area, and also monitor their operations.
15. Forestry Department shall provide us with information on supporting measures for the private sector to invest in reforestation in the Intensive Study Area.
16. Project implementation schedule shall be the one referred to on Table VII-2-5, page 259 in the Interim Report .
17. It is necessary to set up Forest Management Project Center for the implementation of the Project.
18. Implementation bodies for each project component was agreed as described in the Table VII-4-1, page 289 in the Interim Report.

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for

⑤ M/M (12th August, 1999)

**MINUTES OF MEETING
FOR
THE STUDY ON THE RESERVE FOREST MANAGEMENT
IN TRANSITIONAL ZONE IN GHANA**

In pursuance of the Scope of Work of the Study on the Reserve Forest Management in Transitional Zone in Ghana (hereinafter referred to as "the Study") signed on March 19, 1997. Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team to Ghana.

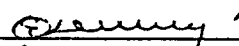
The Study Team headed by Mr. Shinji Tanabe, visited Ghana from August 2, to August 13, 1999, explained to and had a series of discussions with the responsible officials headed by Mr. E. O. Nsenkyire, Chief Conservator of Forests, Forestry Department, Ministry of Lands and Forestry (hereinafter referred to as "FD") on the Draft Final Report of the Study.

The salient results of the discussions were as follows.

1. The Study Team submitted twenty (20) copies of Draft Final Report (DF/R) to FD. The FD side agreed in principle upon the contents of the Draft Final Report.
2. The discussed and agreed issues on the discussion of DF/R were described as in the attachment.

The said issues were discussed and agreed upon by the FD and the Study Team in relation to the Study.

Accra, August 12, 1999

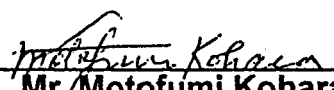


Mr. Edward Osei Nsenkyire
Chief Conservator of Forests
Forestry Department
Ministry of Lands and Forestry
Ghana



Mr. Shinji Tanabe
Team Leader
JICA Study Team

WITNESSED BY



Mr. Motofumi Kohara
JICA Advisory Team

Attachment

1. Main Points of the Discussion and Agreement on the Draft Final Report

- 1) From the viewpoint of importance of the bushfire control "Prevention and control of bushfire " was added as one of the Basic Targets.
- 2) Zoning based on activity range of local people was added in the proper categorization of land use to ensure the smooth participation of local people
- 3) The establishment of sustainable NTFPs tenure (or tenure site) was introduced as part of natural forest management.
- 4) The plan defined industrial plantation as production and utilization of forest resource based upon sustainable development, regardless of any implementation bodies.
- 5) Guidelines for formulation of forest management plan were presented as finalized ones as described in 4 - 7(2) of the Inception Report.

2. Comments on the Draft Final Report from Ghanaian Side

The Ghanaian side will send its comments on the Report to JICA Head Office through JICA Ghana Office not later than 10 September, 1999.

3. Final Report

Within two (2) months after receiving the comments, JICA will send fifty (50) copies of the Final Report to the Ghanaian side as described in the Scope of Work.

Both sides agreed that the Final Report would be open to any parties who are interested in the Study.

4. Study Equipment

The Ghanaian side requested JICA to donate to FD the equipment (a desk top computer, a photocopy machine and a generator) used by the Study Team.

The Study Team explained the necessary procedure for the donation and agreed to convey the request to JICA.

5. Further Cooperation

The Ghanaian side stressed the importance of restoration of the forest reserves and human resource development in furtherance of the cooperation.

(3) Memorandum

① Memorandum (5th February, 1998)

FROM: JICA STUDY TEAM
ON THE RESERVE FOREST
MANAGEMENT TRANSITIONAL
ZONE IN GHANA.

TO: FORESTRY DEPARTMENT
MINISTRY OF LANDS &
FORESTRY,
ACCRA-GHANA.

DATE: 5TH FEBRUARY, 1998.

M E M O R A N D U M

1. The Study Team submitted ten (10) copies of Field Report (1) to Forestry Department.
2. Technology Transfer Plan was finalized and presented after consultation with the counterparts. (attached with Field Report (1) Pg. 9).
3. Classification of Land use/Vegetation and Forest type was prepared by Study Team and discussed by the Study Team and the counterparts.

It was accepted by both sides. (attached with Field Report (1) Pg. 10, 11).
4. The Layout and history of topographic maps were accepted by the Study Team and the counterparts. It was decided however that the legend should be cross-checked with that of Planning Branch to ensure standardization.
5. At a meeting with the Environmental Protection Agency (EPA), The Study Team was advised not to conduct environmental impact assessment (EIA) but rather conduct the environmental survey in formulating the Forest Management Plan.

Asik Boachie-Dapaah
.....

FOR

CHIEF CONSERVATOR OF FORESTS

(A S I K . B O A C H I E - D A P A A H)

Shinji Tanabe
.....

SHINJI TANABE
(TEAM LEADER)

② Memorandum (2nd November, 1998)

FROM : JICA STUDY TEAM
ON THE RESERVE FOREST
MANAGEMENT TRANSITIONAL
ZONE IN GHANA.

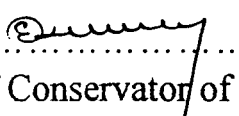
TO: FORESTRY DEPARTMENT
MINISTRY OF LANDS AND FORESTRY
ACCRA GHANA

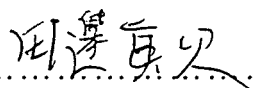
DATE: 2ND NOVEMBER, 1998

MEMORANDUM

1. The Study Team submitted ten (10) copies of Field Report (II) to Forestry Department
2. The Study Team explained to and had series of discussions with the counterparts on the basic matters of the components in ^{the} forest management plan (attached as annex 1)

The basic matters of the components in forest management plan ^{were} ~~was~~ accepted by both sides .


.....
Chief Conservator of forests


.....
Sinji TANABE
(Team Leader)

1. Basic Matters of the Components of Forest Management Plan

The components mean "Basic components of Forest management Plan" in the Progress Report- V.1.4.

(1) Plantation Establishment and Management

(A) Industrial Plantation:

- # The objective is to meet growing demand for timber in the near future.
- # Among the lands classified as Grassland in the Land Use and Vegetation Category, target areas are non-scattered but large collective ones suitable for afforestation inclusive of mechanical land preparation in slope. The concrete area shall be judged by the forest stand map and the aerial photograph interpretation.
- # Main planting species is teak, but line planting of Ofram, indigenous fast growing tree species, will be considered in teak stand in order to avoid mono-culture of teak (mixing rate: teak 80%, ofram 20%) from environmental viewpoint.
- # Planting density is 1,100 seedlings/ha.
- # Final cutting age is 35 in teak, 25 in ofram.
- # Improved taungya system should be introduced in order to give incentives for the people to tend and protect trees. Profit sharing system of mature forest stands will be agreed between the Forestry Department and participating farmers

(B) Community woodlot

- # The objective is to meet the needs of local people and to promote their participation in forest management
- # Of grass lands mentioned above, target areas are scattered ones with maximum area of 40 to 50 ha in the natural or the existing artificial forests.
- # The management system such as cutting age will differ depending on where they are located in natural or artificial forests or other specific location.
- # Main planting species are multi-purpose tree species including fuel wood species. The tree species should be selected from the tree species list that the Forestry Department recommend, taking into consideration the result of tree preference discussion in the socioeconomic survey and the needs of local people.
- # The introduction of agroforestry crops shall not be considered at present.

(C) Green Fire Belt

- # The objective is to prevent and control bush fire and maintain the FR boundary.
- # Target areas are grass lands along FR boundary, block boundary, forest roads etc. and set up in the shape of belt.
- # Green fire belt(40m in width) will be established within the Forest Reserves in collaboration with local people. Those people are allowed to grow not only fire-tolerant species such as cassia siamea but multi-purpose species such as cashew, mango, orange etc. to meet their NTFP needs.
 - Trees planted and tended by farmers belong to them with specific cutting restriction
 - Farmers can choose tree species to be planted(from species provided by FD).
- # Some food crops can be grown to meet people's needs and provide them with incentives

(2) Natural Forest Conservation and Utilization

Felling trees in the natural forests shall be prohibited except for burnt trees. In the gap sites with certain area in the natural forests, compensatory planting of indigenous tree species(for instance Wawa etc.) will be carried out. In order to determine the quantity of planting stock at the planning stage, a certain percentage of natural forest areas judged as very low in crown density will be used for calculation.

(3) Seeds and Seedlings

(A) Establishment of nursery for industrial plantation and compensatory planting in natural forests

A middle or large scale accessible permanent nursery will be established outside the forest reserves. The improvement and expansion of the nursery in the School of Forestry, Sunyani, is one idea.

If it is not possible to establish the above mentioned nursery, a temporary nursery will be set up in each Forest Reserve.

(B) Establishment of nursery for the community woodlot and green fire belt

Community nursery, principally will be promoted in order to supply seedlings to be planted. Forest department may consider purchasing of seedlings raised by farmers.

The location of the nursery will be off reserve, but, when it is difficult, small

scale and simple nurseries will be set up in the forest reserves, where tree species not planned in Forest Management Plan shall be able to be raised for the local people's own use, which will be expected to be an incentive.

(4)Infrastructure

Forest roads, fire breaks and the like will be planned. In this case, cleared width of forest roads will be used as fire breaks.

(5)Harvesting

(A)Plantation Trees

Harvesting including thinning will be planned in the new and existing plantation according to the Silvicultural Regimes in MoP

(B)NTFP

With a view to participatory management for sustainable collection of Bush meats, snail, medicinal herbs etc., the entrust of the actual operation in the collection to the communities will be considered.

Forest Department will ensure the right to collect NTFPs to the local communities for their domestic use, and freer access to NTFPs for commercial purposes by establishing community-based permit system.

(6)Extension and Education(main subject : forest rehabilitation and fire control)

(A)People's Participation

It will be considered how to involve local people in the management of forest reserves in the implementation stage of Forest Management Plan.

Individual Participation

Group Participation

(B)Extension Work

Extension objective(local people, government officials and private sector)

Improvement of extension institution

Consideration of concrete extension items

(C)Education

Consideration of education and training programs

(7) Management

Cooperation among organizations concerned (people, administration, research organization and NGO etc.), implementation process, management and the like will be considered.

Each plan regarding (1) to (7) above mentioned, the component of Forest Management Plan, on the whole, will be prepared based on the basic matters.

(8) Project Benefit Expected

Following benefits can be expected by the implementation of the Project:

- 1) Increase in Teak log production
- 2) Increase in thinned Teak log production for telegraph poles
- 3) Increase in agricultural production in the agro-forestry composed of on-farm and green belt with the introduction of Taungya method
- 4) Increase in fuel wood production
- 5) Prevention of bush fire by fire break and green belt
- (6) Poverty alleviation)
- (7) Environmental improvement)

③ Memorandum (18th March, 1999)

FROM: JICA STUDY TEAM
ON THE RESERVE FOREST
MANAGEMENT TRANSITIONAL
ZONE IN GHANA

TO: FORESTRY DEPARTMENT
MINISTRY OF LANDS &
FORESTRY,
ACCRA-GHANA


DATE: 18 TH MARCH, 1999.

MEMORANDUM

1. The Study Team submitted ten(10) copies of Field Report(III) to Forestry Department.
2. The Study Team explained to and had discussions with the counterparts on the matters related to the Forest Management Plan.
3. Those matters were accepted by both sides. (attached herewith annex 1).



Mr. Edward Osei Nsenkyire
CHIEF CONSERVATOR OF FORESTS



Mr. Shinji Tanabe
TEAM LEADER OF
JICA STUDY TEAM

1. The location of taungya areas etc..

The location of taungya areas, green fire belts and community woodlots will be set up within walking distance of people from their homes for their daily works.

2. The areas other than those mentioned above 1.

The areas other than those mentioned above 1 shall be the ones for industrial plantation, and there shall be established the firebreaks on the forest reserve boundaries and block boundaries by private companies themselves

3. The profit sharing rate for calculation in the project evaluation.

The said rate will be fixed for convenience at the rate of 80 % and 20 % respectively for private companies and for local people.

The real rate shall be decided at the stage of project implementation based on the consultation among the parties concerned such as Forestry Department.

4. The yield calculation of Teak and Ofram for project cost calculation.

#The stand volume of Teak(m³/ha) shall be based on the silvicultural regime and the result analyzed from the reference materials provided by the Planning Branch as reported in the appendix of the Progress Report.

#In case of Ofram, the growth rate(9 m³/ha/yr) referred in the reference materials used in the seminar of the Forestry Commission and the silvicultural regime shall be applied.



2. カウンターパート及び主要面会者

(1) カウンターパート

Areas	Name	Affiliation
Forest Management Plan	F.S.Amoah(Mr).(Cons.of Forests)	Planning Branch,Forestry Department(Kumasi)
	Oheneba A.Agyemang.(Mr) (Senior Cons.of Forests)	Forestry Department(Accra)
Social Forestry	J.F.Anane(Mr) (Principal Cons.of Forests)	Forestry Department(Accra)
	F.S.Amoah(Mr).Cons.of Forests	Planning Branch,Forestry Department(Kumasi)
	Paul Sowah(Mr). (Assist Cons.of Forses)	Planning Branch,Forestry Department(Kumasi)
Forest Inventory and Land-use/Vegetation Survey	F.Aguargo(Mr) (Cons.of Forests)	Planning Branch,Forestry Depart ment(Kumasi)
Social/Gender Analysis	V.Kwablah(Ms) (Asst.Cons.of Forests)	Planning Branch,Forestry Department(Kumasi)
Soil Survey	J.E.Manu(Mr) (District Forstry officer)	Nkawie District Forestry office(Asante)
Nature Protection/ Environment	Maurice W.Nakaar(Mr) (Principal Cons.of Forests)	Regional Forestry Office (Sunyani)
	Paul Sowah(Mr). (Asst Cons.of Forses)	Planning Branch,Forestry Department(Kumasi)
Financial/Economic Evaluation	-ditto-	-ditto-
Aerial Photographing/ Surveying	F.Aguargo(Mr) (Cons.of Forests)	Planning Branch,Forestry Department(Kumasi)

(2) 主要面会者

List of Main Interviewees and Attendance of Meetings

Governmental Organizations

Ministry of Finance & Economic Planning

Agnes Batsa	(Ms.) Head	Bilateral Economic Relations Unit, International Economic Relations
Kwasi Opoku	(Mr.) Chief Economic Planning Officer Desk Officer (Japanese Desk) (Economic Planning Officer)	-ditto-
E. K. Nkansah	(Mr.) Assistant Desk Officer (Economic Planning Officer)	-ditto-

Ministry of Lands & Forestry: MLF

Nayon Bilijo	(Mr.) Deputy Minister	
E. Kofi Smith	(Mr.) Technical Director	Technical Directorate
E. Siisi-Wilson	(Mr.) Deputy Technical Director	-ditto-

Forestry Department: FD, MLF

Edward Osei Nsenkyire	(Mr.) Chief Conservator of Forests	-
A.S.K. Boachie-Dapaah	(Mr.) Deputy Chief Conservator of Forests	-
Oheneba Amponsah Agyemang	(Mr.) Senior Conservator of Forests	-
J.F. Anane	(Mr.) Principal Conservator of Forests	*

Planning Branch, FD

Ben Aninakwa	(Mr.) Planning Officer	-
Francis Sivester Amoah	(Mr.) Conservator of Forests	Management Unit
Fromics B. Agurgo	(Mr.) Conservator of Forests	Survey, Remote Sensing and Mapping Unit
Valerie Kawablah	(Ms.) Assistant Conservator of Forests	Collaborative Forest Management Unit
Twum Boateng	(Mr.) Plantation Officer	Plantation Unit
Paul Sawah	(Mr.) Assistant Conservator of Forests	-ditto-
Musah Abu-Juam	(Mr.) Forest Botanist/Ecologist	Botany Unit
Richrd Minnoni	(Mr.)	*
Bernard Tabil	(Mr.)	*
Fred Koromaerg	(Mr.)	*
Benjamin Adjel	(Mr.)	*
A. Asare	(Mr.)	*
Athuane Nyako	(Mr.)	*

Brong-Ahafo Region

David Osei-Wusu	(Mr.) Regional Minister	
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Regional Forestry Office, Brong Ahafo Region, FD

A. A. Ziblim	(Mr.) Regional Forest Officer	-
Maurice Nakaar	(Mr.) Principal Conservator of Forests	-

Samuel Akortie	(Mr.) District Forestry Officer	Sunyani Forest District
John Assabil	(Mr.) District Foresry Offecer	Dormaa Forest District
School of Forestry, FD Lawrence B. Antwi	(Mr.) Principal	-
Forestry Research Institute, FD Joe R. Cobbinah	(Dr.) Deputy	-
Victor K. Agyemang	(Mr.) Ecologist/ Forest Mangement Specialist	*
Reynolds Okai	(Mr.) Research Scientist	Department of Timber Engineering
E. Owusu-Sekyere	(Mr.) Agroforester	*
Forests Products Inspection Bureau Kingstord E. Auau	(Mr.) Senior Commercial Officer	*
Timber Export Development Board Alex B. Offei	(Mr.) Manager	*
Ministry of Trade & Industry Patrick A. Poku	(Mr.)	Management Information System Division
Wildlife Department, MLF Ofori Frimpong	(Mr.)	*
Survey Department , MLF E. S. Sai	(Mr.) Deputy Director	-
Environmental Protection Agency, Ministry of Environment, Science & Technology E. Dwumfour	(Mr.) Assistant Director	Natural Resources Department
Yaw Amoyaw-Osei	(Mr.) Ag. Head	Environmental Assessment & Audit Department
University of Science & Technology: UST Akwasi Owusu-Bi	(Dr.) Director	Bureau of Integrated Rural Development
S. J. Quashie-Sam	(Dr.) Director	Institute of Renewable Natural Resources
University of Ghana Kojo S. Amanor	(Dr.)	Institute of African Studies
<u>Nongovernmental Organizations</u>		
Theophilus K. Anderson	(Mr.) Director	Friends of the Earth Ghana
Oti Yeboah Complex LTD. J. E. Quansah	(Mr.) Production Manager	
Asuo Bomosadu Timbers Sawmills LTD.(ABTS)		
Eruest Apraku	(Mr.) Managing Director	
J. A. Kuffour	(Mr.) Forest Manager	
<u>International Organizatin</u>		
(United Kindom) Natural Resources Lustitute Trevor Abell	(Mr.) Forestry Specialist	

(3) 調査団の構成

作業監理委員

氏名	担当	所属
渡邊 儀彦	委員長	九州林木育種センター センター長
駒木 貴彰	社会林業	森林総合研究所北海道支所 経営研究室長

調査団

氏名	担当	所属
田邊 眞次	総括 / 森林管理計画	(社) 日本林業技術協会
久道 篤志	社会林業	(社) 日本林業技術協会
渡辺 準蔵	森林調査 / 土地利用植生	(社) 日本林業技術協会
松見 靖子	社会配慮 / ジェンダー	(社) 日本林業技術協会
中村 輝司	土壌調査	(社) 日本林業技術協会
久納 泰光	自然保護 / 環境	(社) 日本林業技術協会
入矢 狷介	事業評価	(株) 三祐コンサルタンツ
大拙 哲也	航空写真撮影 / 測量監督	(株) パスコインターナショナル
酒井 秀明	業務調整	(株) パスコインターナショナル
宮部 秀一	業務調整	(社) 日本林業技術協会

3. 調査関連

項目	内容	数量
航空写真の撮影、地形図の作成	(撮影) 撮影面積 撮影縮尺 撮影コース 撮影写真枚数 (地上測量) GPS 水準測量 (地形図作成) 面積 縮尺	300,000 ha 1/20,000 12 コース 570 枚 37 点 250 km 67,000 ha 1/20,000
土地利用 / 植生調査	(土地利用 / 植生図の作成) 面積 縮尺	300,000 ha 1/50,000
森林調査	(人工林標準地調査) 大きさ プロット数 (天然林標準地調査) 大きさ プロット数 (プロットレスサンプリング) 調査箇所数 (林相図の作成) 面積 縮尺	20mx50m 24 点 20mx500m 5 点 17 点 30,000 ha 1/25,000
土壌調査	(土壌断面調査) 調査試孔点 簡易試孔点 (土壌図の作成) 面積 縮尺	31 点 19 点 30,000 1/25,000
社会経済調査	(ベースライン調査) 調査対象村 調査世帯 (迅速簡易農村調査) 調査対象村 (フォーカスグループミーティング) 調査対象村 対象グループ	30 村 400 世帯 6 村 6 村 4 グループ

Table with columns for Year, Investment, O&M (L/C), Private Company, Local People, and Forestry Department. Rows include years 1 through 50 and a Total row, with sub-columns for Total, F/C, and various cost categories.

Year	Total					Private Company					Local People				Forestry Department								
	Total	F/C	Investment			O&M L/C	Total	F/C	Investment			O&M L/C	Investment			O&M L/C	Total	F/C	Investment			O&M L/C	
			Total	Unskilled Lab.	Other				Total	Unskilled Lab.	Other		Total	Unskilled Lab.	Others				Unskilled Lab.	Total	Unskilled Lab.		Other
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	7,683,600	7,600	7,676,000	7,250,400	425,600	0	0	0	0	0	0	0	6,916,000	6,916,000	0	0	767,600	7,600	760,000	334,400	425,600	0	
7	18,902,300	9,300	18,893,000	18,372,200	520,800	12,874,400	0	0	0	0	0	0	17,963,000	17,963,000	0	0	939,300	9,300	930,000	409,200	520,800	0	
8	19,611,900	7,900	19,604,000	19,161,600	442,400	28,828,600	0	0	0	0	0	0	18,814,000	18,814,000	0	0	797,900	7,900	790,000	347,600	442,400	0	
9	18,872,900	8,900	18,864,000	18,365,600	498,400	42,011,200	0	0	0	0	0	0	17,974,000	17,974,000	0	0	898,900	8,900	890,000	391,600	498,400	0	
10	20,122,900	8,900	20,114,000	19,615,600	498,400	57,087,800	0	0	0	0	0	0	19,224,000	19,224,000	0	0	898,900	8,900	890,000	391,600	498,400	0	
11	11,125,000	0	11,125,000	11,125,000	0	65,940,000	0	0	0	0	0	0	11,125,000	11,125,000	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	58,323,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	51,853,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	44,564,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	43,925,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	45,412,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	44,187,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	45,062,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	45,062,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
25	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
27	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
31	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
32	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
33	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
34	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
35	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
36	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
38	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
39	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
41	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
42	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
43	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
44	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
45	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
46	0	0	0	0	0	37,275,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	96,318,600	42,600	96,276,000	93,890,400	2,385,600	1,591,357,600	0	0	0	0	0	0	92,016,000	92,016,000	0	1,591,357,600	4,302,600	42,600	4,260,000	1,874,400	2,385,600	0	

Cost Flow (5) : Natural Conservation/Improvement

(Unit: Cedis)

Year	Total																			
	Total		Investment			O&M L/C	Private Company		Local People			Forestry Department								
	Total	F/C	Total	L/C			Total	F/C	Investment			Investment			O&M L/C	Investment			O&M L/C	
				Unskilled Lab.	Other	Unskilled Lab.			Others	Unskilled Lab.	F/C	Total	Unskilled Lab.	Other		Unskilled Lab.				
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	10,583,500	0	10,583,500	10,583,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	14,396,000	0	14,396,000	13,847,000	549,000	6,252,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	14,396,000	0	14,396,000	13,847,000	549,000	12,505,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	14,396,000	0	14,396,000	13,847,000	549,000	18,757,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	15,471,700	0	15,471,700	14,922,700	549,000	25,010,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	4,200,000	0	4,200,000	3,595,200	604,800	25,645,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	19,393,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	13,140,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	6,888,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	73,443,200	0	73,443,200	70,642,400	2,800,800	127,592,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Cost Flow (7) : Seedling Production: Village Nersery

(Unit: Gedis)

Year	Total						Private Company						Local People			Forestry Department					
	Total	F/C	Investment			O&M F/C	Total	F/C	Investment			O&M	Investment L/C	O&M F/C	Total	F/C	Investment			O&M F/C	
			Total	Unskilled Lab.	Other				Total	Unskilled La	Other						Unskilled Lab.	Total	Unskilled Lab.		Other
1	88,000	0	88,000	88,000	0	3,000	0	0	0	0	0	88,000	3,000	0	0	0	0	0	0	0	
2	973,000	0	973,000	973,000	0	31,000	0	0	0	0	0	973,000	31,000	0	0	0	0	0	0	0	
3	796,000	0	796,000	796,000	0	25,000	0	0	0	0	0	796,000	25,000	0	0	0	0	0	0	0	
4	2,522,000	0	2,522,000	2,522,000	0	80,000	0	0	0	0	0	2,522,000	80,000	0	0	0	0	0	0	0	
5	1,460,000	0	1,460,000	1,460,000	0	46,000	0	0	0	0	0	1,460,000	46,000	0	0	0	0	0	0	0	
6	7,896,000	0	7,896,000	7,896,000	0	368,000	0	0	0	0	0	7,896,000	368,000	0	0	0	0	0	0	0	
7	10,989,000	0	10,989,000	10,989,000	0	492,000	0	0	0	0	0	10,989,000	492,000	0	0	0	0	0	0	0	
8	8,863,000	0	8,863,000	8,863,000	0	404,000	0	0	0	0	0	8,863,000	404,000	0	0	0	0	0	0	0	
9	10,923,000	0	10,923,000	10,923,000	0	484,000	0	0	0	0	0	10,923,000	484,000	0	0	0	0	0	0	0	
10	11,344,000	0	11,344,000	11,344,000	0	497,000	0	0	0	0	0	11,344,000	497,000	0	0	0	0	0	0	0	
11	1,551,000	0	1,551,000	1,551,000	0	49,000	0	0	0	0	0	1,551,000	49,000	0	0	0	0	0	0	0	
12	2,725,000	0	2,725,000	2,725,000	0	86,000	0	0	0	0	0	2,725,000	86,000	0	0	0	0	0	0	0	
13	1,833,000	0	1,833,000	1,833,000	0	58,000	0	0	0	0	0	1,833,000	58,000	0	0	0	0	0	0	0	
14	2,091,000	0	2,091,000	2,091,000	0	66,000	0	0	0	0	0	2,091,000	66,000	0	0	0	0	0	0	0	
15	3,172,000	0	3,172,000	3,172,000	0	100,000	0	0	0	0	0	3,172,000	100,000	0	0	0	0	0	0	0	
16	775,000	0	775,000	775,000	0	24,000	0	0	0	0	0	775,000	24,000	0	0	0	0	0	0	0	
17	1,696,000	0	1,696,000	1,696,000	0	54,000	0	0	0	0	0	1,696,000	54,000	0	0	0	0	0	0	0	
18	1,189,000	0	1,189,000	1,189,000	0	38,000	0	0	0	0	0	1,189,000	38,000	0	0	0	0	0	0	0	
19	1,909,000	0	1,909,000	1,909,000	0	60,000	0	0	0	0	0	1,909,000	60,000	0	0	0	0	0	0	0	
20	2,086,000	0	2,086,000	2,086,000	0	66,000	0	0	0	0	0	2,086,000	66,000	0	0	0	0	0	0	0	
21	887,000	0	887,000	887,000	0	28,000	0	0	0	0	0	887,000	28,000	0	0	0	0	0	0	0	
22	2,298,000	0	2,298,000	2,298,000	0	73,000	0	0	0	0	0	2,298,000	73,000	0	0	0	0	0	0	0	
23	1,652,000	0	1,652,000	1,652,000	0	52,000	0	0	0	0	0	1,652,000	52,000	0	0	0	0	0	0	0	
24	3,109,000	0	3,109,000	3,109,000	0	98,000	0	0	0	0	0	3,109,000	98,000	0	0	0	0	0	0	0	
25	2,922,000	0	2,922,000	2,922,000	0	92,000	0	0	0	0	0	2,922,000	92,000	0	0	0	0	0	0	0	
26	1,551,000	0	1,551,000	1,551,000	0	49,000	0	0	0	0	0	1,551,000	49,000	0	0	0	0	0	0	0	
27	2,725,000	0	2,725,000	2,725,000	0	86,000	0	0	0	0	0	2,725,000	86,000	0	0	0	0	0	0	0	
28	1,833,000	0	1,833,000	1,833,000	0	58,000	0	0	0	0	0	1,833,000	58,000	0	0	0	0	0	0	0	
29	2,091,000	0	2,091,000	2,091,000	0	66,000	0	0	0	0	0	2,091,000	66,000	0	0	0	0	0	0	0	
30	3,172,000	0	3,172,000	3,172,000	0	100,000	0	0	0	0	0	3,172,000	100,000	0	0	0	0	0	0	0	
31	850,000	0	850,000	850,000	0	27,000	0	0	0	0	0	850,000	27,000	0	0	0	0	0	0	0	
32	1,703,000	0	1,703,000	1,703,000	0	54,000	0	0	0	0	0	1,703,000	54,000	0	0	0	0	0	0	0	
33	1,325,000	0	1,325,000	1,325,000	0	42,000	0	0	0	0	0	1,325,000	42,000	0	0	0	0	0	0	0	
34	1,827,000	0	1,827,000	1,827,000	0	58,000	0	0	0	0	0	1,827,000	58,000	0	0	0	0	0	0	0	
35	2,106,000	0	2,106,000	2,106,000	0	67,000	0	0	0	0	0	2,106,000	67,000	0	0	0	0	0	0	0	
36	982,000	0	982,000	982,000	0	31,000	0	0	0	0	0	982,000	31,000	0	0	0	0	0	0	0	
37	2,284,000	0	2,284,000	2,284,000	0	72,000	0	0	0	0	0	2,284,000	72,000	0	0	0	0	0	0	0	
38	1,636,000	0	1,636,000	1,636,000	0	52,000	0	0	0	0	0	1,636,000	52,000	0	0	0	0	0	0	0	
39	3,227,000	0	3,227,000	3,227,000	0	102,000	0	0	0	0	0	3,227,000	102,000	0	0	0	0	0	0	0	
40	2,858,000	0	2,858,000	2,858,000	0	90,000	0	0	0	0	0	2,858,000	90,000	0	0	0	0	0	0	0	
41	1,551,000	0	1,551,000	1,551,000	0	49,000	0	0	0	0	0	1,551,000	49,000	0	0	0	0	0	0	0	
42	2,725,000	0	2,725,000	2,725,000	0	86,000	0	0	0	0	0	2,725,000	86,000	0	0	0	0	0	0	0	
43	1,833,000	0	1,833,000	1,833,000	0	58,000	0	0	0	0	0	1,833,000	58,000	0	0	0	0	0	0	0	
44	2,091,000	0	2,091,000	2,091,000	0	66,000	0	0	0	0	0	2,091,000	66,000	0	0	0	0	0	0	0	
45	3,172,000	0	3,172,000	3,172,000	0	100,000	0	0	0	0	0	3,172,000	100,000	0	0	0	0	0	0	0	
46	775,000	0	775,000	775,000	0	24,000	0	0	0	0	0	775,000	24,000	0	0	0	0	0	0	0	
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	128,066,000	0	128,066,000	128,066,000	0	4,711,000	0	0	0	0	0	128,066,000	4,711,000	0	0	0	0	0	0	0	

Year	Total																							O&M	Private Company						Local People						Forestry Department						O&M
	Investment					O&M			Total	F/C	Investment			O&M	L/C	Investment	L/C	Total	F/C	Investment		L/C	Total		F/C																		
	Total	F/C	Total	L/C	Other	Total	F/C	L/C			Total	F/C	L/C							Total	F/C					L/C	Total	F/C	L/C	Total	F/C	L/C	Unskilled Lab	Others									
									Unskilled Lab	Others																																	
1	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	0	0	0																																			
2	55,227,000	38,995,000	15,232,000	2,018,000	13,214,000	552,000	400,000	152,000																																			
3	82,842,000	58,993,000	22,849,000	3,027,000	19,822,000	1,857,000	1,200,000	457,000																																			
4	82,842,000	58,993,000	22,849,000	3,027,000	19,822,000	3,314,000	2,400,000	914,000																																			
5	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	4,971,000	3,600,000	1,371,000																																			
6	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	5,523,000	4,000,000	1,523,000																																			
7	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	6,075,000	4,399,000	1,676,000																																			
8	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	6,827,000	4,799,000	1,828,000																																			
9	0	0	0	0	0	7,179,000	5,199,000	1,980,000																																			
10	27,814,000	19,998,000	7,816,000	1,009,000	6,807,000	7,179,000	5,199,000	1,980,000																																			
11	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
12	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
13	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
14	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
15	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
16	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
17	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
18	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
19	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
20	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
21	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
22	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
23	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
24	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
25	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
26	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
27	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
28	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
29	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
30	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
31	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
32	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
33	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
34	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
35	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
36	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
37	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
38	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
39	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
40	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
41	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
42	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
43	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
44	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
45	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
46	0	0	0	0	0	7,732,000	5,599,000	2,133,000																																			
47	0	0	0	0	0	0	0	0																																			
48	0	0	0	0	0	0	0	0																																			
49	0	0	0	0	0	0	0	0																																			
50	0	0	0	0	0	0	0	0																																			
Total	388,595,000	279,989,000	106,826,000	14,128,000	92,500,000	321,429,000	232,760,000	88,669,000	0	0	0	0	0	0	0	321,429,000	232,760,000	88,669,000	388,595,000	279,989,000	106,826,000	14,128,000	92,500,000	0	0	0																	

Year	Total										Private Company					Local People					Forestry Department				
	Investment			O&M			Total		F/C		L/C		Total	F/C	Investment		L/C	O&M	Total	F/C	Investment		L/C	O&M	
	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	Total	L/C	Total	F/C			L/C	Total					F/C	L/C			Total
			Unskilled Lab	Other							Unskilled Lab	Other													
1	1,889,000	0	1,889,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	8,544,000	0	8,544,000	0	0	133,000	0	133,000	0	0	0	0	0	133,000	0	133,000	0	0	0	0	0	0	0		
3	15,200,000	0	15,200,000	0	0	304,000	0	304,000	0	0	0	0	0	304,000	0	304,000	0	0	0	0	0	0	0		
4	10,434,000	0	10,434,000	0	0	512,000	0	512,000	0	0	0	0	0	512,000	0	512,000	0	0	0	0	0	0	0		
5	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	0	0		
6	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	0	0		
7	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	0	0		
8	1,889,000	0	1,889,000	0	0	817,000	0	817,000	0	0	0	0	0	817,000	0	817,000	0	0	0	0	0	0	0		
9	0	0	0	0	0	950,000	0	950,000	0	0	0	0	0	950,000	0	950,000	0	0	0	0	0	0	0		
10	6,655,000	0	6,655,000	0	0	950,000	0	950,000	0	0	0	0	0	950,000	0	950,000	0	0	0	0	0	0	0		
11	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
12	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
13	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
14	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
15	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
16	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
17	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
18	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
19	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
20	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
21	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
22	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
23	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
24	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
25	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
26	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
27	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
28	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
29	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
30	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
31	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
32	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
33	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
34	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
35	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
36	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
37	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
38	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
39	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
40	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
41	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
42	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
43	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
44	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
45	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
46	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	988,000	0	988,000	0	0	0	0	0	0	0		
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	44,611,000	0	44,611,000	0	0	41,685,000	0	41,685,000	0	0	0	0	0	41,685,000	0	41,685,000	0	0	0	0	0	0	0		

(2) 事業費の総括

Summary of Total Financial Costs (Without Escalation)

(Unit: 1,000c)

	民間企業			地域住民			林業局			計		
	投資	維持・運営	計	投資	維持・運営	計	投資	維持・運営	計	投資	維持・運営	計
人工林造成・管理計画												
産業造林												
(タウンヤ方式導入)												
植栽	1,771,849	8,321,972	10,093,821	472,967	2,866,642	3,339,609	0	0	0	2,244,816	11,188,614	13,433,430
農作物				0	11,835,450	11,835,450	0	0	0	0	11,835,450	11,835,450
小計	1,771,849	8,321,972	10,093,821	472,967	14,702,092	15,175,059	0	0	0	2,244,816	23,024,064	25,268,880
(タウンヤ方式未導入)												
植栽	2,348,370	5,082,009	7,430,379	0	0	0	0	0	0	2,348,370	5,082,009	7,430,379
小計	2,348,370	5,082,009	7,430,379	0	0	0	0	0	0	2,348,370	5,082,009	7,430,379
計	4,120,219	13,403,981	17,524,200	472,967	14,702,092	15,175,059	0	0	0	4,593,186	28,106,073	32,699,259
村落林												
小計	0	0	0	92,016	1,591,358	1,683,374	4,303	0	4,303	96,319	1,591,358	1,687,677
防火緑地帯												
小計	0	0	0	92,016	1,591,358	1,683,374	4,303	0	4,303	96,319	1,591,358	1,687,677
植栽	0	0	0	311,620	1,065,050	1,376,670	23,731	0	23,731	335,351	1,065,050	1,400,401
農作物				0	2,101,383	2,101,383	0	0	0	0	2,101,383	2,101,383
小計	0	0	0	311,620	3,166,433	3,478,053	23,731	0	23,731	335,351	3,166,433	3,501,784
計	4,120,219	13,403,981	17,524,200	876,603	19,459,883	20,336,486	28,034	0	28,034	5,024,856	32,863,864	37,888,720
天然林保全管理計画												
改良	0	0	0	0	0	0	73,443	127,592	201,035	73,443	127,592	201,035
計	0	0	0	0	0	0	73,443	127,592	201,035	73,443	127,592	201,035
育苗計画												
中央苗畑	576,530	62,585	639,115	0	0	0	596,881	63,182	660,063	1,173,411	125,767	1,299,178
村落苗畑				128,066	4,711	132,777	0	0	0	128,066	4,711	132,777
計	576,530	62,585	639,115	128,066	4,711	132,777	596,881	63,182	660,063	1,301,477	130,478	1,431,955
合計	4,696,749	13,466,566	18,163,315	1,004,669	19,464,594	20,469,263	698,358	190,774	889,132	6,399,776	33,121,934	39,521,710
インフラ計画												
林道一防火帯												
小計	4,401,590	3,162,007	7,563,597	0	0	0	0	0	0	4,401,590	3,162,007	7,563,597
苗畑施設等												
中央苗畑	0	0	0	0	0	0	1,295,104	2,343,240	3,638,344	1,295,104	2,343,240	3,638,344
村落苗畑	0	0	0	0	321,429	321,429	386,595	0	386,595	386,595	321,429	708,024
見張り塔	0	0	0	0	0	0	110,256	93,555	203,811	110,256	93,555	203,811
給水施設	0	0	0	0	41,685	41,685	44,611	0	44,611	44,611	41,685	86,296
小計	0	0	0	0	363,114	363,114	1,836,566	2,436,795	4,273,361	1,836,566	2,799,909	4,636,475
計	4,401,590	3,162,007	7,563,597	0	363,114	363,114	1,836,566	2,436,795	4,273,361	6,238,156	5,961,916	12,200,072
普及・教育計画												
戸別訪問	0	0	0	0	0	0	54,280	0	54,280	54,280	0	54,280
ワークショップ	0	0	0	0	0	0	992,510	0	992,510	992,510	0	992,510
現地実習	0	0	0	0	0	0	164,197	0	164,197	164,197	0	164,197
教育訓練	0	0	0	0	0	0	954,325	0	954,325	954,325	0	954,325
計	0	0	0	0	0	0	2,165,312	0	2,165,312	2,165,312	0	2,165,312
NGOによる住民支援												
計	0	0	0	0	0	0	129,800	0	129,800	129,800	0	129,800
外部コンサルタント												
計	0	0	0	0	0	0	1,267,800	0	1,267,800	1,267,800	0	1,267,800
村落森林管理委員会												
計	0	0	0	0	0	0	149,760	0	149,760	149,760	0	149,760
民間企業の強化												
計	753,600	0	753,600	0	0	0	0	0	0	753,600	0	753,600
森林管理センター												
計	753,600	0	753,600	0	0	0	0	0	0	753,600	0	753,600
環境配慮	0	0	0	0	0	0	0	43,200	43,200	0	43,200	43,200
計	0	0	0	0	0	0	0	43,200	43,200	0	43,200	43,200
合計	5,155,190	3,162,007	8,317,197	0	363,114	363,114	5,549,238	2,479,995	8,029,233	10,704,428	6,005,116	16,709,544
税												
借地料												
産業造林(タウンヤ)	0	239,472	239,472				0			0	239,472	239,472
産業造林	0	240,437	240,437				0			0	240,437	240,437
小計	0	479,909	479,909	0	0	0	0	0	0	0	479,909	479,909
伐採権料												
産業造林(タウンヤ)	0	9,519,392	9,519,392				0			0	9,519,392	9,519,392
産業造林	0	9,939,574	9,939,574				0			0	9,939,574	9,939,574
小計	0	19,458,966	19,458,966	0	0	0	0	0	0	0	19,458,966	19,458,966
計	0	19,938,875	19,938,875	0	0	0	0	0	0	0	19,938,875	19,938,875
環境配慮												
産業造林(タウンヤ)	0	150,190	150,190							0	150,190	150,190
産業造林	0	74,304	74,304							0	74,304	74,304
林道一防火帯	0	75,636	75,636							0	75,636	75,636
計	0	300,130	300,130							0	300,130	300,130
合計	0	20,239,005	20,239,005	0	0	0	0	0	0	0	20,239,005	20,239,005
総計	9,851,939	36,867,578	46,719,517	1,004,669	19,827,708	20,832,377	6,247,596	2,670,769	8,918,365	17,104,204	59,366,055	76,470,259

Summary of Total Financial Costs (Without Escalation) 1 US\$=

2,290 c

(Unit: 1,000 US\$)

	Private Company Cost			Local People Cost			Forestry Department Cost			Total Cost		
	Investmen	O &M	Total	Investmen	O &M	Total	Investmen	O &M	Total	Investmen	O &M	Total
人工林造成・管理計画												
産業造林 (タウンヤ方式導入)												
補栽	774	3,634	4,408	207	1,252	1,458	0	0	0	980	4,886	5,866
農作物	0	0	0	0	5,168	5,168	0	0	0	0	5,168	5,168
小計	774	3,634	4,408	207	6,420	6,627	0	0	0	980	10,054	11,034
(タウンヤ方式未導入)												
補栽	1,025	2,219	3,245	0	0	0	0	0	0	1,025	2,219	3,245
小計	1,025	2,219	3,245	0	0	0	0	0	0	1,025	2,219	3,245
計												
村落林	0	0	0	40	695	735	2	0	2	42	695	737
小計	0	0	0	40	695	735	2	0	2	42	695	737
防火線地帯	0	0	0	136	465	601	10	0	10	146	465	612
補栽	0	0	0	0	918	918	0	0	0	0	918	918
農作物	0	0	0	136	1,383	1,519	10	0	10	146	1,383	1,529
小計	0	0	0	136	1,383	1,519	10	0	10	146	1,383	1,529
計	1,799	5,853	7,652	383	8,498	8,881	12	0	12	2,194	14,351	16,545
天然林保全管理計画												
改良	0	0	0	0	0	0	32	56	88	32	56	88
計	0	0	0	0	0	0	32	56	88	32	56	88
育苗計画												
中央苗畑	252	27	279	0	0	0	261	28	288	512	55	567
村落苗畑	0	0	0	56	2	58	0	0	0	56	2	58
計	252	27	279	56	2	58	261	28	288	568	57	625
合計	2,051	5,881	7,932	439	8,500	8,939	305	83	388	2,795	14,464	17,258
インフラ計画												
林道一防火帯	1,922	1,381	3,303	0	0	0	0	0	0	1,922	1,381	3,303
小計	1,922	1,381	3,303	0	0	0	0	0	0	1,922	1,381	3,303
苗畑施設等	0	0	0	0	0	0	566	1,023	1,589	566	1,023	1,589
中央苗畑	0	0	0	0	140	140	169	0	169	169	140	309
村落苗畑	0	0	0	0	0	0	48	41	89	48	41	89
見張り塔	0	0	0	0	18	18	19	0	19	19	18	38
給水施設	0	0	0	0	159	159	802	1,064	1,866	802	1,223	2,025
小計	0	0	0	0	159	159	802	1,064	1,866	802	1,223	2,025
計	1,922	1,381	3,303	0	159	159	802	1,064	1,866	2,724	2,603	5,328
普及・教育計画												
戸別訪問	0	0	0	0	0	0	24	0	24	24	0	24
ワークショップ	0	0	0	0	0	0	433	0	433	433	0	433
現地実習	0	0	0	0	0	0	72	0	72	72	0	72
教育訓練	0	0	0	0	0	0	417	0	417	417	0	417
計	0	0	0	0	0	0	946	0	946	946	0	946
NGOによる住民支援												
計	0	0	0	0	0	0	57	0	57	57	0	57
外部コンサルタント												
計	0	0	0	0	0	0	554	0	554	554	0	554
村落森林管理委員会												
計	0	0	0	0	0	0	65	0	65	65	0	65
民間企業の強化												
計	329	0	329	0	0	0	0	0	0	329	0	329
森林管理センター												
計	0	0	0	0	0	0	0	19	19	0	19	19
合計	2,251	1,381	3,632	0	159	159	2,423	1,083	3,506	4,674	2,622	7,297
税												
借地料	0	105	105	0	0	0	0	0	0	0	105	105
産業造林(タウンヤ)	0	105	105	0	0	0	0	0	0	0	105	105
産業造林	0	210	210	0	0	0	0	0	0	0	210	210
小計	0	210	210	0	0	0	0	0	0	0	210	210
伐採権料	0	4,157	4,157	0	0	0	0	0	0	0	4,157	4,157
産業造林(タウンヤ)	0	4,340	4,340	0	0	0	0	0	0	0	4,340	4,340
産業造林	0	8,497	8,497	0	0	0	0	0	0	0	8,497	8,497
小計	0	8,497	8,497	0	0	0	0	0	0	0	8,497	8,497
計	0	8,707	8,707	0	0	0	0	0	0	0	8,707	8,707
環境配慮												
産業造林(タウンヤ)	0	66	66	0	0	0	0	0	0	0	66	66
産業造林	0	32	32	0	0	0	0	0	0	0	32	32
林道一防火帯	0	33	33	0	0	0	0	0	0	0	33	33
計	0	131	131	0	0	0	0	0	0	0	131	131
合計	0	8,838	8,838	0	0	0	0	0	0	0	8,838	8,838
総計	4,302	16,099	20,402	439	8,658	9,097	2,728	1,166	3,894	7,469	25,924	33,393

Benefit Flow (Financial)

Year	Industrial Plantation with Taungya					Industrial Plantation without Taungya					Green Fire Belt					Grand Total (Cedis)	Grand Total (000Cedis)
	Total	Private Company	Local People	Forestry Department	Crop Production	Total	Private Company	Local People	Forestry Department	Total	Private Company	Local People	Forestry Department	Crop Production			
1	0					0				0				0	0	0	
2	0	0	0			0	0			1,608,000				1,608,000	1,608,000	1,608	
3	180,096,000	0	0		180,096,000	0	0			10,636,000				10,636,000	190,732,000	190,732	
4	424,924,000	0	0		424,924,000	0	0			12,286,000				12,286,000	437,210,000	437,210	
5	1,476,624,000	0	0		1,476,624,000	0	0			43,412,000				43,412,000	1,520,036,000	1,520,036	
6	2,227,190,540	0	1,710,540		2,225,480,000	0	0			70,378,000				70,378,000	2,297,568,540	2,297,569	
7	3,928,203,440	0	2,755,440		3,925,448,000	905,580	905,580			128,116,000				128,116,000	4,057,225,020	4,057,225	
8	3,794,282,660	0	5,100,660		3,789,182,000	2,530,980	2,530,980			124,039,000				124,039,000	3,920,852,640	3,920,853	
9	6,123,694,240	0	9,102,240		6,114,592,000	1,044,900	1,044,900			179,004,000				179,004,000	6,303,743,140	6,303,743	
10	3,786,765,060	0	10,619,060		3,776,146,000	5,433,480	5,433,480			330,149,000				330,149,000	4,122,347,540	4,122,348	
11	5,746,238,520	0	9,232,520		5,737,006,000	11,124,540	11,124,540			666,964,000				666,964,000	6,424,327,060	6,424,327	
12	4,186,810,540	7,301,840	21,388,700		4,158,120,000	10,797,780	10,797,780			777,134,000				777,134,000	4,974,742,320	4,974,742	
13	5,951,441,480	11,782,240	29,385,240		5,910,294,000	15,482,540	15,482,540			839,357,000				839,357,000	6,806,261,020	6,806,261	
14	2,420,614,160	21,773,360	27,824,800		2,371,016,000	38,334,360	38,334,360			898,617,000				898,617,000	3,357,565,520	3,357,566	
15	3,726,499,400	38,855,040	30,002,360		3,657,642,000	32,471,920	32,471,920			957,877,000				957,877,000	4,716,848,320	4,716,848	
16	83,756,360	42,427,360	41,329,000			45,819,280	45,819,280			1,020,100,000				1,020,100,000	1,149,675,640	1,149,676	
17	69,768,280	34,735,520	35,032,760			87,698,520	87,698,520			1,064,545,000				1,064,545,000	1,222,011,800	1,222,012	
18	124,072,280	67,704,160	56,368,120			94,059,040	94,059,040			1,076,845,000				1,076,845,000	1,294,976,320	1,294,976	
19	170,396,160	85,920,800	84,475,360			75,499,820	75,499,820			1,053,677,000				1,053,677,000	1,299,573,080	1,299,573	
20	117,909,280	62,580,640	55,328,640			147,576,000	147,576,000			766,344,000				766,344,000	1,031,829,280	1,031,829	
21	75,586,240	43,169,920	32,416,320			174,197,440	174,197,440			469,396,000				469,396,000	719,179,680	719,180	
22	255,809,440	185,638,880	70,170,560			78,848,640	78,848,640			134,872,000				134,872,000	469,530,080	469,530	
23	306,331,840	245,079,680	61,252,160			194,407,200	194,407,200			131,770,000				131,770,000	632,509,040	632,509	
24	497,745,760	418,303,520	79,442,240			386,501,280	386,501,280			133,174,000				133,174,000	1,017,421,040	1,017,421	
25	1,044,708,800	861,400,192	183,308,608			382,586,240	382,586,240			207,219,000				207,219,000	1,634,514,040	1,634,514	
26	622,468,160	538,546,240	83,921,920			493,197,120	493,197,120			356,006,000				356,006,000	1,471,671,280	1,471,671	
27	875,723,960	719,353,888	156,370,072			829,020,800	829,020,800			666,964,000				666,964,000	2,371,708,760	2,371,709	
28	1,552,267,680	1,281,286,848	270,980,832			788,052,280	788,052,280			777,134,000				777,134,000	3,115,453,960	3,115,454	
29	2,091,020,360	1,694,888,032	396,132,328			1,545,408,040	1,545,408,040			839,357,000				839,357,000	4,475,785,400	4,475,785	
30	3,336,535,040	2,682,874,048	653,660,992			1,303,227,240	1,303,227,240			900,045,000				900,045,000	5,539,807,280	5,539,807	
31	2,756,780,360	2,230,065,728	526,714,652			2,392,245,200	2,392,245,200			961,509,000				961,509,000	6,110,534,580	6,110,535	
32	1,093,011,040	872,204,480	220,806,560			3,138,714,380	3,138,714,380			1,005,268,000				1,005,268,000	5,236,993,420	5,236,993	
33	2,297,296,580	1,833,756,736	463,539,844			1,800,123,140	1,800,123,140			1,043,603,000				1,043,603,000	5,141,022,720	5,141,023	
34	1,290,817,360	1,025,372,096	265,445,264			2,559,156,820	2,559,156,820			1,032,238,000				1,032,238,000	4,882,212,180	4,882,212	
35	803,048,740	633,843,744	169,104,996			3,579,344,520	3,579,344,520			784,156,000				784,156,000	5,166,549,260	5,166,549	
36	1,519,635,400	1,208,322,304	311,313,096			2,000,176,220	2,000,176,220			488,069,000				488,069,000	4,007,880,220	4,007,881	
37	2,624,655,548	2,085,413,990	539,241,558			10,797,780	10,797,780			227,976,000				227,976,000	2,863,429,328	2,863,429	
38	4,222,982,968	3,359,309,414	863,573,554			1,389,796,956	1,389,796,956			130,747,000				130,747,000	5,743,426,924	5,743,427	
39	7,790,507,392	6,218,496,922	1,572,010,470			3,879,422,856	3,879,422,856			123,343,000				123,343,000	11,793,273,248	11,793,273	
40	13,882,680,248	11,097,044,582	2,785,635,666			1,618,242,400	1,618,242,400			166,607,000				166,607,000	15,667,529,648	15,667,530	
41	10,524,568,688	8,404,406,710	2,120,161,978			8,291,825,776	8,291,825,776			392,632,000				392,632,000	19,209,026,464	19,209,026	
42	4,939,710,360	3,939,548,248	1,000,161,112			13,966,220,960	13,966,220,960			725,628,000				725,628,000	19,831,559,320	19,831,559	
43	10,349,283,056	8,264,898,685	8,264,898,685			8,084,165,688	8,084,165,688			845,283,000				845,283,000	19,278,731,744	19,278,732	
44	6,010,230,496	4,781,766,221	1,228,464,275			11,396,021,896	11,396,021,896			904,543,000				904,543,000	18,310,795,392	18,310,795	
45	3,752,491,184	2,987,916,179	764,575,005			16,041,084,912	16,041,084,912			960,840,000				960,840,000	20,754,416,096	20,754,416	
46	6,809,642,704	5,441,200,083	1,368,442,621			9,139,192,544	9,139,192,544			960,840,000				960,840,000	16,909,675,248	16,909,675	
47																	
48																	
49																	
50																	
Total	135,664,725,824	73,427,269,331	18,690,866,493		43,746,570,000	96,028,737,168	96,028,737,168	0	0	25,390,307,000	0	0		25,390,307,000	257,283,769,992	257,283,769	

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