



Environmental & Social Monitoring 2018 Akumadan Plantations





Authors
Address

Telephone
Fax
Email
Website
Document version
Date of document
Reference

Form international

T. Wanders
Eijerdijk 87
8051 MS Hattem
The Netherlands
+ 31 38 444 89 90
+ 31 38 444 89 91
info@forminternational.nl
www.forminternational.nl
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CONTENTS

INTRODUCTION.....	2
1. COMPANY PROFILE.....	3
2. SITE DESCRIPTION.....	4
3. COMPANY OPERATIONS.....	8
4. ENVIRONMENTAL HEALTH AND SAFETY POLICY.....	13
5. ENVIRONMENTAL MANAGEMENT ACTIVITIES.....	14
6. OCCUPATIONAL HEALTH AND SAFETY (OHS).....	18
7. SOCIAL MONITORING.....	1
8. ENVIRONMENTAL MONITORING.....	2
8.1 Water Quality Monitoring Data (complete the table below) if applicable. Provide coordinates of sampling points.....	2
8.2 Boreholes and pumps Akumadan and Berekum.....	2
8.3 AKUMANDAN PLANTATION STREAMS.....	3
8.4 Development water characteristics in streams in Akumadan plantations.....	7
8.5 Measures to improve on your performance (environmental Quality and Operation).....	8
9. OTHER ENVIRONMENTAL MONITORING ACTIVITIES.....	9
9.1 Plantation monitoring.....	9
9.2 Monitoring methods.....	10
9.2.1 Biological diversity.....	10
9.2.2 Forest health.....	12
9.2.3 Protection against fire.....	12
9.2.4 Soil protection.....	12
9.2.5 Status ESMP.....	12
9.2.6 Rainfall.....	13
9.2.7 Forest production.....	14
9.3 Economic aspects.....	14
9.4 Social benefits.....	14
9.4.1 Grievance and redress.....	14
9.4.2 Unions.....	16
9.5 Economic Impact Mitigation Action Plan: Update second quarter.....	16

INTRODUCTION

This is the report on social and environmental performance of Form Ghana during the first quarter of 2018. The report is produced to comply with the requirements on reporting of the African Development Bank.

1. COMPANY PROFILE

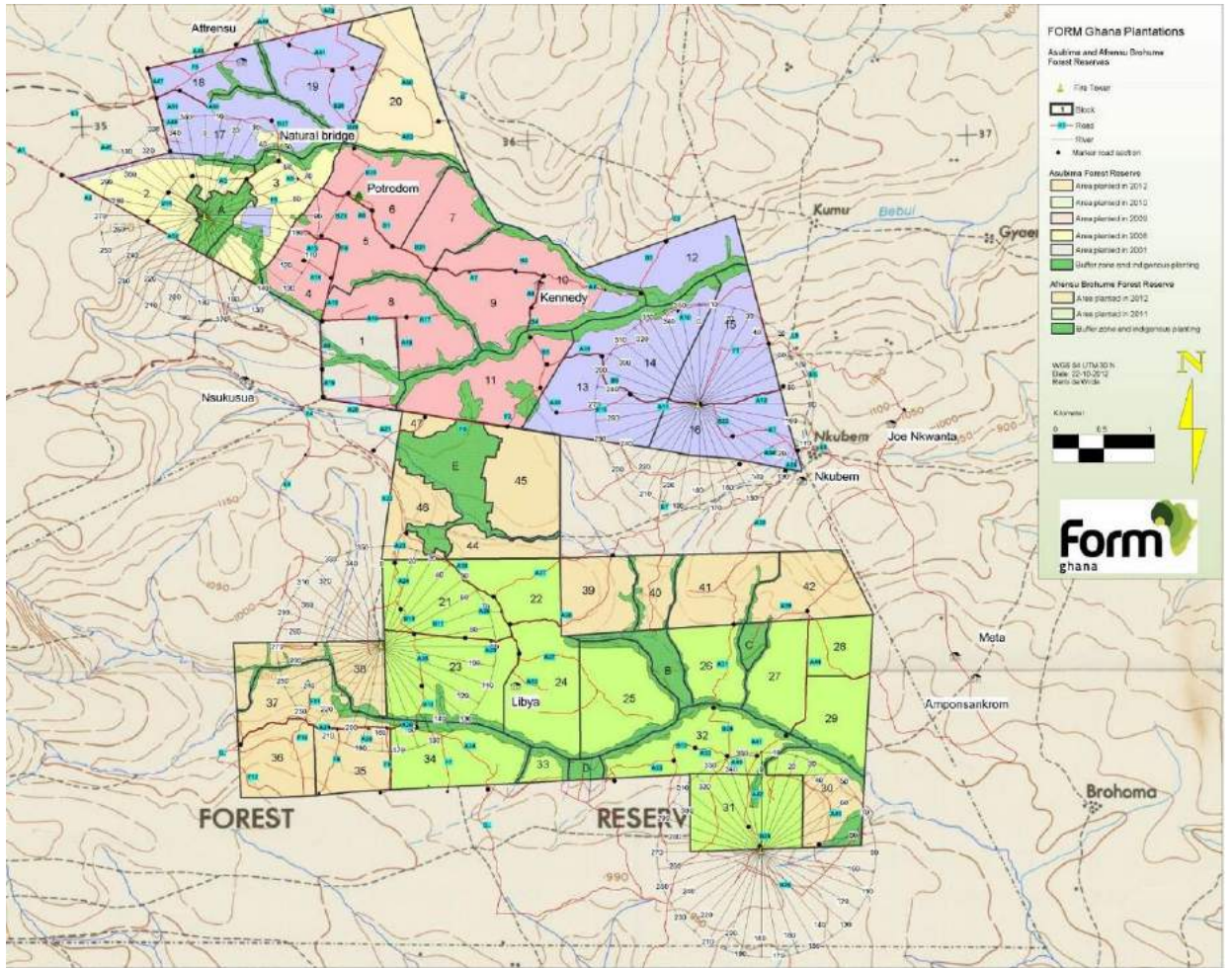
EPA #	Information required	Information provided					
1.1	Name of Company	FORM GHANA LTD					
1.2	Type of Undertaking	Reforestation / Forest Management					
1.3	Year of establishment of project	2007					
1.4	Location	Akumadan / Offinso North / Ashanti					
1.5	Contact Person:	Mr. W.A. Fourie Position: Managing Director					
	Tel. No.	0544441440					
	Email:	W.fourie@formghana.org					
1.6	Address for correspondence	PO Box SYI 211, Sunyani, Brong Ahafo, Ghana					
1.7	Permits / Licenses and Certificates obtained. Do you have valid permits from the following institutions?:						
No	Institution	Permit		Permit No / License No / Date of issue /Expiry			
		Yes	No				
1	Environmental Protection Agency	X		CF:62/LG/FO/02 expiring august 14, 2021			
2	Water Resources Commission	X		FGLID 421 / 18 exp. 31-12-2021			
3	Forestry Services Division		X				
4	Wildlife Division		X				
5	Others (pls. specify)		X				
1.8	Work Force category						
Division	General Workers			Management			Total
	Male	Female	Total	Male	Female	Total	
Sunyani(HQ)	3	2	5	8	1	9	14
Sunyani(HQ) C							
Akumadan P	84	47	131	10	2	12	143
Akumadan C	144	42	186				186
Berekum P	174	44	218	25	5	30	248
Berekum C	323	164	487				487
G.T	728	299	1027	43	8	51	1078
M/F ratio	71%	29%		84%	16%		
Permanent staff (P)							
Casual Staff (C)							

2. SITE DESCRIPTION

EPA #	Information required		Information provided				
2.2	Location and major landmarks		The Asubima and Afrensu Brohuma Forest Reserves are found in the northern tip of the Ashanti region in the Offinso North District. The reserves form a contiguous block of forest reserve. The nearest towns are Akumadan and Techiman.				
2.3	Geographical Coordinates of Concession		The plantations are located within the Asubima and Afrensu Brohuma Forest Reserves in Offinso North District near Akumadan, in the Ashanti region. Coordinates (WGS 84 - UTM) for the reserves are:				
		Point		X-coordinate		Y-coordinate	
		1		630.857,53		813.998,60	
		2		628.112,11		822.930,15	
		3		620.644,40		820.840,93	
		4		624.388,38		817.874,20	
		5		622.666,10		815.162,44	
2.3	Total land take of concession		3447.4 GIS area				
2.4	Actual Area Forested		3416 hectares				
RESERVE	LEASE AREA (ha)	YEAR (ha)	TOTAL AREA (ha)	INDIGENOUS (ha)	TEAK (ha)	UNPRODUCTIVE (ha)	AREA PER RESERVE (ha)
ASUBIMA	1776,5	2001	66,1	11,6	53,8	0,8	1667,5
		2006	107,5	15,0	91,4	1,0	
		2008	171,5	22,4	148,2	1,0	
		2009	609,0	92,3	512,6	4,2	
		2010	713,4	88,5	612,5	12,4	
AFRENSU BROHUMA	1778,1	2011	986,4	132,8	844,3	9,3	1779,9
		2012	793,5	127,8	663,1	2,6	
2.5	Area under conservation		521 hectares				
	Type of conservation: strict		0 hectares				
	Type of conservation: partial		521 hectares				
	List some species found: Trees:		Afzelia Africa, Albizia ferruginea. Antiaris toxicaria, Ceiba pentandra, Hildegardia barteri, Erythrophleum ivorense, Khaya anthoteca, Khaya grandifoliola, Milicia excelsa, Triplochiton scleroxylon, Terminalia superba.				
	Mammals		Mammals : The most frequently observed species were Praomys tullbergi and Crocidura crosseii. Lemniscomys striatus and Crocidura				

		jouvenetae were the least observed species, with only one sighting of each species. Large quantities of the straw-coloured fruit bat (<i>Eidolon helvum</i>) can be observed flying over the plantation area at dusk. In daytime, the bats rest in trees at the plantation site.
	Birds:	The moustached grass warbler was the most frequently recorded species. This is likely to be the result of the abundance of grasses in the area, providing suitable habitat for the moustached grass warbler and other weaver species.
2.6	List any Rivers / Streams traversing or within 100 m of the concession:	Various sources of the Asuasa stream in Asubima Forest Reserve Various branches of the Brohuma stream in Afrenso Brohuma Forest Reserve.
2.6.1	What is the buffer distance maintained between the concession and rivers?	The buffer distance between the teak plantation and the streams (<4-5 m wide stream beds) is thirty meters.
2.7	Approximate distance of rivers to nearest settlement to the concession:	Kumu village is some 500 metres away from the plantation and some 200 metres from the Asuasu (Bebui) stream. Nkubem is on the border of the plantation and also on the side of an affluent of the Brohuma stream. Other villages are more than a kilometre away or not bordering any stream.
2.8	Adjacent land Uses:	North: Teak plantation South: Degraded forest Reserve / agriculture /teak plantations East: Agriculture West: Agriculture
2.9	What ancillary facilities do you have on site:	<ul style="list-style-type: none"> • The nursery is not on the forest reserves. It is about 3 kilometres away from the nearest point of Asubima Forest Reserve. At the nursery the following facilities exist: • 2 staff houses, • 1 guesthouse • 2 office blocks • 1 workshop

		<ul style="list-style-type: none"> • 1 training centre • 1 canteen • 1 store • 1 fuel station • 3 greenhouses • 1 sanitary block • 4 lockable sea containers (as stores) • 1 kindergarten • 1 guard house • 1 water pump house • 4 shade sheds with irrigation • 6 hectares of irrigated terrain • 1 fence • On the boundaries of the plantations there are several guard shelters • 4 fire towers (inside the plantation)
2.10	Distance between the concession and the nearest town / village:	Distance to Akumadan is about 5 kilometres. Some villages are within a distance of 1 kilometre.



Map of the Akumadan plantations

3. COMPANY OPERATIONS

EPA #	Information required	Information provided	
3.1	Type of forestry development	1) Production management	
		3) plantation	
3.2	Answer the following section for forest establishment:		
3.2.1	Production Details: Planting Material Information:		
Species Cultivated /planted	Source e.g. own nursery, private nursery, FD	Area (hectares)	% of planted area
Teak	Own nursery	3416	86%
Indigenous (Ofram, Awiemfosamina, Kokrodua, Potrodom, Onyina, Emeri, Watapuo	Own nursery	490	14%
3.2.1.b	Expected products from the development:	Teak billets Teak poles Teak sawn timber	

3.2.2 Brief description of operations – from nursery to harvesting (attach an environmentally based flow chart, indicating waste streams) and how the waste is managed.

Plant production: Plant production takes place in the nursery. Each year the terrain for the nursery is cleared of weeds, ploughed and beds are created by creating footpaths every 1 by 5 meters. The seeds are then positioned in rows 10 centimetres apart and 15 centimetres apart in the row. Weeding is done every month. Spraying is only foreseen when insects or fungi attack the plants.

The nursery is also the site for the offices and the workshop. Waste produced is workshop / garage waste (tires, used oil, used filters, used car batteries). Another category of waste produced is the household / office waste (paper, food scraps and peelings). Nursery waste would mainly be packaging of phytosanitary products used in the plantation. See protocol 4 for waste management.

Terrain preparation: Terrain preparation is done in several separate activities; land demarcation, land clearing, spraying, ploughing, road construction and pegging.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Land demarcation: This activity consists of the measuring and marking in the field of planting blocks. The work consist of tracing lines using compass and GPS. Along the lines pegs are planted and the vegetation is cut with cutlasses.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Land clearing: This work consist of manually cutting weeds and bushes as well as the removal of small trees with chainsaws. When needed the cut vegetation is burned to provide clean terrain for ploughing and subsequent work.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Spraying: This is the application of glyphosate on the weeds that sprout again after land clearing.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Ploughing: This activity consists of opening up and turning the soil with a tractor pulling a disc plough. Ploughing can only be done in areas with few tree stumps present, and where the soil is of a type allowing it. Some soil react to this activity by severe concretion forming.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Road construction: This work consists of the removal of the top layer of the soil in a straight line to a width of 6 meters. This work is done using a Bulldozer or a grader. The removed soil is pushed to the side of the road. The profile of the roads is rounded with a drainage ditch to either side. At regular intervals exit drains are created to allow water to drain of the surface into the vegetation on the site. Drains are made in such a way that drainage of water directly into streams is avoided.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Pegging: This activity entails the placement of sticks at intervals of 3 by 3 meters in the terrain. It is done to provide a regular grid based on straight lines on which to plant trees. The sticks for this work are collected in the surroundings and are often made of Bamboo or Raphia.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Planting stumps: Stump planting consists of digging a small hole of 20 centimetres diameter and 25 centimetres depth. In this hole a stump is placed in an upright position, and the soil is filled back into the hole around it. After filling the soil is compacted by the workers using their heel.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Planting polybags: Indigenous trees in polybags are planted in a fashion similar to the planting of stumps. It is done by digging a small hole of 20 centimetres diameter and 25 centimetres depth. In this hole the polybag is placed in an upright position. The poly-bags is removed from the root ball of the plant, and the soil is filled back into the hole around it. After filling the soil is compacted by the workers using their heel.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4). Polybags need to be collected from the field and taken back to the site where they are burnt.

Weeding: weeding consists of the removal of vegetation growing up around the Teak or indigenous trees. This needs to be removed in order to avoid competition. A few different techniques will be used, such as bush knife weeding (done by teams wielding bush knives), chemical weeding with glyphosate (done by teams using droplet applicators) and circle weeding (done by teams using hoes to scrape the soil in a circle around the young plants).

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Pruning: the branches that the tree produces have to be removed at regular two year interval. Trees can be removed to a height of about one third of total tree height. Taking of more branches reduces the growth speed of trees. Work is done manually using telescopic hand saws.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Thinning: When the trees grow they start competing with each other for space and re-sources such as nutrients, water and light. In order to assure continued growth part of the trees will need to be removed. These trees are sawn down using chainsaws or harvester machines. The first thinnings have no commercial value and are left to decom-pose and enrich the soil. In subsequent thinnings the stems are taken to the road side for loading on trucks.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Final felling: At the end of the rotation the trees will be harvested. This activity consists of the felling and cross-cutting of the trees. This activity will be done using harvesters.

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Monitoring: The project activities and intended results are monitored according to a pre-defined plan (see monitoring plan) to see how effective project implementation is and whether the intended results (growth, biodiversity development etc.) are achieved. Monitoring can consist of measurements in plots (in Teak or indigenous planting for in-stance), inventories (biodiversity studies) or regular checks (cleanliness of the site, waste disposal etc.).

Waste here is associated with the presence of workers: plastic bags and food leftovers: waste bins provided make sure the waste is collected and brought back to the nursery (see protocol 4).

Waste disposal: Waste produced during all processes of the company is sorted and disposed of in a way depending on the nature of the waste. Waste like paper and plastics are burned and the ashes burned. Used oils are stored and sold, old tires can be sold or stored (see waste disposal protocol).

EPA #	Information required		Information provided	
3.2.3	Indicate the type, source, quantities and mode of application of chemicals if applicable			
	Type	Source	Quantity / Annum	Mode of application
1	Glyphosate (Kalach)	Dizengoff, Accra	0 kg	
2	Clethodim (Select EC 120)	Dizengoff, Accra	0 kg	
3	Triclopyr (Triclon)	Dizengoff, Accra	0 kg	
4	Granular kieserite fertilizer		350 kg	Granular application for nursery soil restoration
5	Muriate of Potash		500 kg	Granular application for nursery soil restoration
6	Omya Calciprill 110		700 kg	Granular application for nursery soil restoration
7	Di Ammonium phosphate (DAP)		500 kg	Granular application for nursery soil restoration
8	NPK		150kg	Granular applica-

			tion for nursery soil restoration
	These products have been used as weedicides. Form Ghana uses pesticides that do not figure on the FSC® List of 'highly hazardous' pesticides FSC-STD-30-001a EN Last updated: 2 October 2017		
3.2.4.	What area of land has been planted for the year under review	No area has been planted. The planting in the Akumadan estates finished in 2012.	
3.2.5	Briefly describe harvesting and post harvesting operations	Currently only thinning has been undertaken. This was described under 3.2.2.	
3.3	This section applies to the extractive sector / Production Forest:		
3.3.1	Type / name of forest:	Asubima Afrenso Brohuma Forest Reserves / Teak plantation	
3.3.2	Type of forestry product harvested:	Harvesting started in Q2 and is ongoing	
3.3.3	Quantity of forest product collected or harvested per annum	The volume produced up to end Q4 is 849m ³ of round logs. Of this 751 m3 were sold.	
3.3.4	State the purpose of the forest product:	The product to be harvested will be sold as billets, which will be sent for export.	
3.3.5	How do you collect or harvest these products (mechanism)	Until 2021 all products are part of a thinning. Thinnings are a necessary activity in plantation forestry where part of the trees are removed to make room for the ones remaining. The marked trees are checked by FC. The felling team then goes to the trees to fell them and cut them in sections according to specifications. After this the logs are extracted by tractor to the road side. Here the poles are loaded onto trucks. The billets were squared close to the plantation.	
3.3.6	Do you work manually or do you use equipment	For the felling and extraction equipment is used (chainsaws and tractor).	
3.3.7	List equipment	<ul style="list-style-type: none"> • Husqvarna chainsaw • Farmtrac tractor • Winch 	
3.3.8	Area operated / size of the land covered:	During 2018 a start was made with the thinning of the 2008 planted area. The 2008 area covers 171 hectares	

4. ENVIRONMENTAL HEALTH AND SAFETY POLICY

4.1 What were your main environmental, occupational health and safety policy objectives for the year? List them.

Environmental objectives for 2018 are the continued protection of the plantation and buffer zones from bush fire and other environmental hazards and the flora monitoring of the buffer.

Occupational health and safety objectives are to have no work related disease and no serious work related injuries in 2018

4.2 What were your main environmental, occupational health and safety policy targets for the year? List them.

Environmental objectives for 2018 are the continued protection of the plantation and buffer zones from bush fire and other environmental hazards and the flora monitoring of the buffer.

Occupational health and safety objectives are to have no work related disease and no serious work related injuries in 2018. An important step in this is the acquisition of new vehicles for transport of personnel.

5. ENVIRONMENTAL MANAGEMENT ACTIVITIES

EPA #		Information required			Information provided		
Origin	Type	Reduction	Hazard classification	Disposal	Tracing	Tracing	
Workshop	Tyres		Hazardous if burnt	Zoomlion	keep waybills	Zoomlion	
	Batteries (dry cell)	Use re-chargeable batteries.	Hazardous	Zoomlion		Zoomlion	
	Batteries (vehicle) (lead-acid)		Hazardous	Zoomlion	keep waybills	Zoomlion	
	Used oil		Hazardous / potential for recycling	Total	keep waybills	Total	
	Oil filters		hazardous / partial potential for recycling	Zoomlion	keep waybills	Zoomlion	
	Used cables, wreckage and other metal waste (scrap)		inert / recyclable	Zoomlion	keep waybills	Zoomlion	
Stores, nursery, plantation	Non-hazardous waste (plastics planting bags)		Non hazardous / potential for recycling	Zoomlion	keep waybills	Zoomlion	
	Hazardous waste (paint, thinner)		hazardous	Zoomlion	keep waybills	Zoomlion	
	Hazardous waste (pesticide package)		hazardous	Zoomlion	keep waybills	Zoomlion	
	Waste from harvest operations	Felling technique	no danger	Zoomlion	keep waybills	Zoomlion	
Office buildings	Fluorescent Light Bulbs	Best possible quality.	hazardous	Zoomlion	keep waybills	Zoomlion	
Stores (containers), nursery (bags, trays)	Plastic waste	Reusing containers, trays	Not hazardous / potential for recycling	Zoomlion	keep waybills	Zoomlion	
5.1	What type and quantities of waste does your operation generate e.g. liquid, farm waste (plastics) List them:			<ul style="list-style-type: none"> • 26 used tires • 131 kg of plastic bags • 94 chemical containers (200 li- 			

EPA #	Information required	Information provided
	a) solid	tre drums) <ul style="list-style-type: none"> • 6 car batteries
	b) liquid	Liquid waste concerns mostly used engine oil Volume produced in 2018 is 407 litres
	Medical waste	153 kg
5.2	How do you manage the waste streams (listed in 5.1. above) handling, treatment and disposal	Protocol 4 has been adapted to include the new cooperation with Zoomlion. Zoomlion has been contracted to manage all solid waste form Form Ghana. They will report on this monthly. The website of zoomlion provides some information: http://www.zoomlionghana.com/index.php/en/
5.3	Provide brief information on the following a) measures put in place to prevent bush fires	Form Ghana has an intensive fire prevention program (see attached protocol). The program is based on awareness raising among the neighbouring villages and the workers, the creation of fire breaks, the surveillance using fire towers (4) and the continuous posting of rapid response teams that have been specifically trained in fire-fighting.
	b) practises employed to control weeds and pests	Now that the plantation is reaching the closed canopy stage, weed are mostly suppressed. Only in some of the spots where the trees are youngest is there any need for weeding / chemical weeding. These are the practises employed to control the weeds.
	c) practises employed to conserve biodiversity	Biodiversity conservation is managed by Form Ghana through the protection of the buffer zones with indigenous vegetation, through the strict control on hunting and through fire prevention. The monitoring of the effect of this conservation measures shows it is working (latest report on flora monitoring is available on www.formghana.com).
5.4	List soil management practises	Form Ghana protects the soil through

EPA #	Information required	Information provided		
	undertaken (mulching, erosion control, etc.).	reforestation practises and erosion control. Erosion control mainly takes place on the roads.		
5.5	How did these practises contribute to increase in production level?	No increase detected and also not expected.		
5.6 a	Did you experience disease / pest infestation?	Die back was observed on some large teak trees in block 1. The trees topple for no apparent reason. Upon closer scrutiny it became apparent that the large structural roots were rotten. A study was conducted to inventory the spread of this problem. It seems to be limited to Block 1 and to affect only 1% of the trees in specific location.		
b	How were the diseases / pests managed?	An approach will be decided upon when the analysis is complete and specialists have been consulted.		
c	Practises employed to manage admitted farms:	No admitted farms within the Form Ghana area.		
d	Practises employed to manage neighbouring communities	Form Ghana engages with the neighbouring communities in an active way through the organisation of stakeholder meetings and sensitisation meetings. Stakeholder meetings were not yet held in 2018.		
e	Practises employed to manage livestock grazing / fire	Life stock grazing is not an issue in Asumbu / Afrenso Brohuma. Fire was discussed under 5.3.a		
5.7	Provide brief information on the following:			
5.7.1	Chemical management a) quantity of chemicals utilised and final disposal of containers, unused or expired products:			
	Type	Quantity / Annum	Final disposal site	Qty of unused or expired product
1	Glyphosate (Kalach)	0 kg	Zoomlion	None
2	Clethodim (Select EC 120)	0 kg	Zoomlion	None
3	Triclopyr (Triclon)	0 kg	Zoomlion	None

	Granular kieserite fertilizer	350 kg	Zoomlion	none
	Muriate of Potash	500 kg	Zoomlion	none
	Omya Calciprill 110	700 kg	Zoomlion	none
	Di Ammonium phosphate (DAP)	500 kg	Zoomlion	none
	NPK	150kg	Zoomlion	none
	These products have been used as weedicides and fertilizers. Form Ghana uses pesticides that do not figure on the FSC® List of 'highly hazardous' pesticides FSC-STD-30-001a EN Last updated: 2 October 2017			
3.7 b	b) Management practises in place to prevent / control discharge of chemical; contaminants into the environment:		Form Ghana adheres to it protocols and procedures. In this case protocols P05 Responsible use of pesticides, Protocol 04 Waste Management and P16 storage of Fuels, lubricants and toxins.	
5.8	Indicate resource use (energy and water) for Q1:			
Fuel Type	Diesel		Petrol	
	Akumadan	Berekum	Akumadan	Berekum
Total	35,675	146,974	9,631	16,101
	Power:		Use of power is 29,522.95 kilowatts at the Akumadan site for 2018. This power was purchased from VRA	
	Power generated by Solar panels		Total solar power generated in Akumadan is 64,420 kilowatts. This is the total since the start of recording. Monthly power generation is about 3000 watts	
5.9	Explain the variation (increase / decrease) in trend:		There is an increase noticeable of energy consumption, which is caused by the increase of activities since the AfDB funding was mobilized. Timber harvesting has also started.	

6. OCCUPATIONAL HEALTH AND SAFETY (OHS)

EPA #	Information required	Information provided
6.1	Indicate any OHS training undertaken during the year under review:	
TRAINING SUMMARY - 2018		
DATE	TOPIC	PARTICIPANTS
04-01-2018	Waste management	35
04-01-2018	Safety Issues	7
04-01-2018	First Aid	55
05-01-2018	Security Issues	33
12-01-2018	PSP monitoring	6 Permanent, 2 Casual
26-01-2018	Cough	94
28-02-2018	Lassa Fever	94
28-02-2018	Lassa Fever	125 Permanent, 54 Casual
5-03-2018t	PSP monitoring	8 Casual
7-03-2018	PSP monitoring	8 Casual
16-03-2018	Security Issues	31
18-04-2018	Production of seedlings in jiffies	9 (1 Casual)
20-04-2018	Waste management	11
22-05-2018	Protocol 9-Transport of Personnel, and Vehicle management	27
30-05-2018	Internal rules & regulations	98
1-06-2018	Peptic Ulcer	101
18-06-2018	Company mission and Vision statement and Gender policy	12
22-06-2018	Absent management policy	92
29-06-2018	Gender Policy	96
20-06-2018	Waste management	103
23 to 28-06-2018	Chainsaw training	13
27-07-2018	HIV Awareness	88
7-08-2918	Disciplinary Procedure	7
7/8-08-2018	Safety in harvesting, Log scaling, log handling, tally and tagging	15 (8 casual)
17-22-09-18	Fire bosses and RRT	12 Permanent
2-4-10-2018	Spraying Team	14 permanent 9 casual
10-10-2018		8 Permanent
17-10-2018	Management Assistants, Foremen and Team leaders	11 Permanent

26-10-2018	Workers	98 Permanent
26-10-2018	Harvesting Workers	19 Permanent 16 Casual
22-11-2018	Excel training	7Permanent
28-29-11-18	Forest fire fighting training	15 Permanent 35 Casuals
29-11-2018	Domestic fire	29Permanent 2 Casuals
12-12-2018	Job grading	12 Permanent management members
6.2	Did you undertake medical check-up for staff? Yes / No:	No
6.3	Have you registered staff under any Health Insurance Scheme? Yes If yes, name scheme	National Health Insurance Scheme of Ghana
	Do you have the following? Washrooms:	Yes 4 pieces
	Personal Protective equipment:	Yes see protocol P10, personal protection
	First aid Kit:	Each team in the field has a first aid kit and a trained first aider. All vehicles have first aid kits
	Fire extinguisher	Yes, Fire extinguishers are kept at strategic locations.
Year	2018	
Workers		329
Medical attention		1178
Hospital intervention		107
During 2018 medical attention was issued 1178times. The most frequent ailment was musco-skeletal pain (212 times). The second most frequent ailment was Cough that occurred 131 times. Stomach ache occurred 79 times. During the year 107 cases were referred to hospital for more detailed diagnosis or further treatment.		
6.5	Did you record any accidents during the year? If yes indicate the type(s) of accidents and frequency:	No accidents were recorded.
6.6	What accounted for these accidents?	
6.7	How were the accidents managed?	
6.10	Provide a brief on the company's emergency response plan:	Form Ghana has a protocol which dictates how to act in case of emergency. This is Protocol 08

				First Aid Procedures & Emergency Evacuation.
6.11	Provide a brief on community social responsibility			
Date	Location	Type of meeting	# of people present	Topics (Agenda) discussed
1-2-2018	Akumadan	Project Affected People	5	Update PAPs on their settlement progress in Kotaa
27-2-2018	Akumadan	Meeting with Project Affected People	9	To meet all PAPs and update them on kotaa progress
23-7-2018	Akumadan	Meeting with Project Affected People	6	To meet all PAPs and update them on kotaa progress
24-7-20148	Akumadan	stakeholders meeting	37	Visit to Akumadan to participate and also offers support in offering answers to some pertinent question fro the communities District Assembly and especiallyintercroppers.
26-10-2018	Kotaa	Community meeting	19	To officially hand over a transit quarters to 7 households Project affected people from Akumadan . A function was held at kotaa palace for their resettlement . In attendance were the Elders, chief , Queenmother and Community members .
4th December, 2018	Akumadan	Stakeholder meeting	34	Opening remarks and introduction Feedback from last stakeholders' meeting Form Ghana News The Impact of fire on Form Ghana project The Meaning of Form Ghana stakeholders The Roles of the various stakeholders during the fire season Collaboration between Form Ghana and stakeholders during the fire season Security
20-12-2018	Offinso	Homage	1	Visit to Omanhene of Offinso

		meet- ing		
The interaction of Form Ghana with the population and communities is governed by the protocols P 06 Stakeholder Engagement Plan, P 07 Grievance Redress Mechanism and the P 28 Community Development Plan.				

7. SOCIAL MONITORING

Social monitoring report (26th-30th November, 2018)

No.	Questionnaire	Response from communities							
		Atrensu (fr)*	Nkubem (ofr)**	Joe-nkwanta (ofr)**	Libya (fr)*	Amponsakrom (ofr)**	Sreso/ Konkomba(ofr)*	Meta(ofr)*	Nsukuasua (ofr)*
Attendance		M(10),F(0)	M(3),F(0)	M(12),F(11)	M(2), F(0)	M(19),F(6)	M(16),F(0)	M(31), F(0)	M(16),F(1)
1a. Facilities	Electricity	none	none	Present (Hydro-electricity)	none	None	None	Present (Hydro-electricity)	None
	Drinking water	Stream ("Atrensu")	Stream ("Adwoasika")	Stream ("Srada", "Brohuma")	Stream	Well(1)	Stream (Nana Kontua)	Borehole (1)/ stream	Stream (Nsukuasua)
	Church /mosque	Church(1), mosque(1)	Church(none), mosque(none)	none	none	Church(none), mosque(1)	Church present,(2) mosque present(1)	Church present(3), mosque(1)	Church present(1), no mosque
1c. location	Water source	200m from village on foot	2km from village on foot	1.5km from village on foot	500m away ones location by foot	3.2km by foot from the village (Amponsah krom)	500m from village on foot	Stream 500m from village on foot/bore hole within the community	200m away from village
	Hospital	Akumadan *10km *By foot/bicycle / motor tricycle	Asunasa *5km *By foot/motor tricycle	Asunasa *5km *By foot/motor tricycle	Akumadan *15km *By motorbike	Nsunasa *6.4km Nkenkansu *14.4km *All by - motorbike	Akumadan *8km *By foot/bicycle / motor tricycle	Nsunasa *2km By foot/car/ motorbike Nkenkansu *20km	Akumadan *12km *By motorbike

								By foot/car/motorbike	
	Primary school	Sreso(8km)/Akumadan *10km *On foot/car	Dompoase *2km * On foot/bicycle	Dompoase *2km * On foot/bicycle	Akumadan	Meta *2.4km *By foot	Sreso/Akumadan *4km/8km *By foot/ bicycle	Within the village/ community (Meta) by foot	Akumadan *12km away *By foot/motorbike Nsukuasua *250m *By foot
	Secondary	Akumadan *10km *On foot/bicycle/motor tricycle	Nkoranza *28km * by car	Nkoranza *28km * by car	Akumadan	Akumadan *8km *By car/mini bus Nkoranza *40km *By car/ mini bus	Akumadan *8km *By foot/bicycle / motor tricycle	Akumadan *8km *By car/mini bus Nkoranza *40km *By car/ mini bus	Akumadan *12km *By foot/ bicycle
	Dirt road	Atrensu-Akumadan *8km *On foot/bicycle/motor tricycle	Nkubem-Dompoase/ Nsunasa *3km * by foot/bicycle	Joe Nkwata-Dompoase/ Nsunasa *5km * by foot/bicycle	Libya	Amponsah krom-Meta 1.5km by foot/motorbike	Sreso-Akumadan *8km *On foot/bicycle/motor tricycle	Meta-Amponsah krom 1.5km by foot/ bicycle	Nsukuasua-Akumadan *12km *By foot/bicycle/motor tricycle
	Paved road	Akumadan-Techiman by car	Nkoranza *28km	Nkoranza *28km	Akumadan-Techiman by car	Kobreso *14.4km by motorbike	Techiman – Akumadan-Kumasi highway	Kobreso *14.4km by motorbike	Akumadan *8km
	Market	Akumadan *10km * On foot , bicycle or motor tricycle	Nkoranza *28km by mini bus	Nkoranza *28km by mini bus	-	Abofour, Nkoranza on motorbike , car/mini bus	Akumadan on foot/motor tricycle	Abofour, Nkoranza on motorbike , mini	Akumadan *12km By motorbike

bus

2 a. Impact of project on communities

Community	Positive impacts	Concerns
Atrensu (fr)*	Collection of waste from thinning and pruning as yam stakes and roofing their thatch houses	No concern raised
Nkubem (ofr)**	Employment opportunities (casual/contract workers) village members Assistance during land preparation in burning their farmlands	Recruiting members from the community to be part of the fire teams (Rapid Response Team and Support Team)
Joe-Nkwanta (ofr)**	Employment opportunities (casual/contract workers) village members Assistance during land preparation in burning their farmlands	Recruiting members from the community to be part of the fire teams (Rapid Response Team and Support Team)
Libya (fr)*	Collection of waste from thinning and pruning as firewood	No concern raised as they are preparing to resettle elsewhere in Berekum
Amponsakrom (ofr)**	Employment opportunities for community members Firewood collection from the plantation	No concern raised

	Assistance to burn their farmlands during land preparation	
Sreso/Konkomba (ofr)*	Now have good motorable road to transport food crops and other stuff to market Some of their inhabitants are employed by the company as mentioned by some members	No concern raised
Meta (ofr)*	Source of Employment for youth in the community Collection of waste from thinning and pruning as yam stakes, firewood and roofing their thatch houses	They asked that at least some of the community members be recruited as part of the Fire teams (RRT and support team)
Nsukuasua (ofr)*	Collection of waste from thinning and pruning as firewood and yam stakes Assistance to burn their farmlands during land preparation	They had no major concern

b. Communication with Project Company

Community	Company accessibility	Information transfer
Atrensu (fr)*	Access they have with the company has improved and they appreciate that.	Through personal interaction/communication
Nkubem (ofr)**	The doors of the company is always open to them as mentioned by most members	Through personal interaction and group discussion
Joe-nkwanta (ofr)**	Access to company is good. The doors of the company are always open to them	Information transfer through group discussion has been the channel
Libya (fr)*	They have good access to the company	Through personal interaction/through FORM Ghana security personnel
Amponsakrom (ofr)**	Relationship with the company is very good	Through personal/group interactions and stakeholder meetings
Sreso/Konkomba(ofr)*	Have good relationship with the company and have good access to the company, interaction with the company has improved and they are satisfied	Through personal interaction/communication with staffs of the company/Through stakeholders meetings
Meta(ofr)*	Accessibility to the company is very good	Through personal interactions/stakeholder meetings
Nsukuasua (ofr)*	Accessibility to the company has improved	Through group discussions/stakeholder meetings/ FORM Ghana security personnel

*Ofr- Outside Forest Reserve

**fr- Inside forest reserve (Asubima & Afrensu Brohuma Forest Reserves)

M - Male

F - Female

8. ENVIRONMENTAL MONITORING

8.1 Water Quality Monitoring Data (complete the table below) if applicable. Provide coordinates of sampling points.

Document and justify any change in water quality monitoring points and parameters (OS4)

No change

Report on water quality (OS4)

Water quality has not changed significantly (see 8.3)

Report on quantity of water consumption, bore hole water quality and height of water table (Ghana Water Resource Authority)

8.2 Boreholes and pumps Akumadan and Berekum

Table 1: Pumps and volume taken up

Pump ID	Location	Capacity	Total volume pumped 2018 (m3)	Action time
Ground FOS	Site Berekum	2Hp	5,246	Daily
Ground FOS	BII Berekum	1 Hps	656	Daily
Ground FOS	B46 Berekum	1.5Hp	1,132	Daily
Ground FOS	A24 Berekum		889	
Xtra	Site Akumadan	2Hp	2,654	Daily
Saer	Site irrigation Akumadan	30Hp	10,789	Daily

Water quality analysis has been done for Akumadan and Berekum on sites and within the plantations. The water pumped is not only for irrigation and fire control but also for domestic purposes. All boreholes have been treated. Analysis of the water from the borehole at Akumadan site is provided below:

Table 2: Physico-chemical and microbiological analysis test results (Akumadan site)

Parameter	Method	Detection limits / units	Reference value	Results Akumadan Site borehole
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Parameter	Method	Detection limits / units	Reference value	Results Akumadan Site borehole
pH	Electrometric	–	6.5_8.5	6.5
Conductivity	Electrometric	Cm	–	38.0
Total Dissolved solids	Electrometric	ppm	1000	19.0
Turbidity	Nephelometric	FTU	5	3.02
Colour	Platinum_cobalt	Pt. Co	0_15	6.0
Ammonia_ (Nitrogen)	Nessler	0.0_2.50ppm	1.5	0.0239
Iron	FerroVer	0.0_3.00ppm	0.3	0.024
Faecal coliform	Multiple tube	MPN Index/100mL	0.0	3.0
Total Viable Count	Total plate count	CFU	0_3	10.0

Remarks: The source water sample as submitted to the laboratory does satisfy the required Standard for its parameters except Ph and Microbia . It is recommended for treatment before domestic use. Treatment has been done to correct water parameter effects .

The cause of the low pH and high microbe count is thought to be due to an influx of ground water with low pH and relatively high microbe count.

8.3 AKUMANDAN PLANTATION STREAMS

Table 3: Physico-chemical and microbiological analysis test results (Stream 1 Akumadan site)

Parameter	Method	Detection limits / units	Reference value	Results Akumadan plantation stream 1 (see map)
Ph	Electrometric	–	6.5_8.5	6.59
Conductivity	Electrometric	Cm	–	48.0
Total Dissolved solids	Electrometric	ppm	1000	24.0
Turbidity	Nephelometric	FTU	5	4.62

Parameter	Method	Detection limits / units	Reference value	Results Akumadan plantation stream 1 (see map)
Colour	Platinum_cobalt	Pt. Co	0_15	20.0
Ammonia_ (Nitrogen)	Nessler	0.0_2.50ppm	1.5	0.259
Iron	FerroVer	0.0_3.00ppm	0.3	0.24
Faecal coliform	Multiple tube	MPN Index/100mL	0.0	20.0
Total Viable Count	Total plate count	CFU	0_3	60.0

Remarks :The source water sample as submitted to the laboratory does satisfy the required Standard for its chemical parameters except the Microbia and is recommended for treatment before domestic use. As it is a stream no treatment is foreseen. The reason that Microbes is higher than for consumption is that the stream passes through agricultural land and can receive faecal coliform from all the areas it passes through before entering the plantation.

Table 4: Physico-chemical and microbiological analysis test results (Stream 2 Akumadan site)

Parameter	Method	Detection limits / units	Reference value	Results Akumadan plantation stream 2 (see map)
pH	Electrometric	–	6.5_8.5	6.52
Conductivity	Electrometric	Cm	–	67.0
Total Dissolved solids	Electrometric	ppm	1000	33.0
Turbidity	Nephelometric	FTU	5	7.49
Colour	Platinum_cobalt	Pt. Co	0_15	30.0
Ammonia_ (Nitrogen)	Nessler	0.0_2.50ppm	1.5	0.157
Iron	FerroVer	0.0_3.00ppm	0.3	0.311
Faecal coliform	Multiple tube	MPN Index/100mL	0.0	24.0

Parameter	Method	Detection limits / units	Reference value	Results Akumadan plantation stream 2 (see map)
Total Viable Count	Total plate count	CFU	0_3	70.0

Remarks: The source water sample as submitted to the laboratory does satisfy the required Standard for its Chemical parameters but except the Microbia and is recommended for treatment before domestic use. As it is a stream no treatment is foreseen. The reason that Microbes is higher than for consumption is that the stream passes through agricultural land and can receive fecal coliform from all the areas it passes through before entering the plantation.

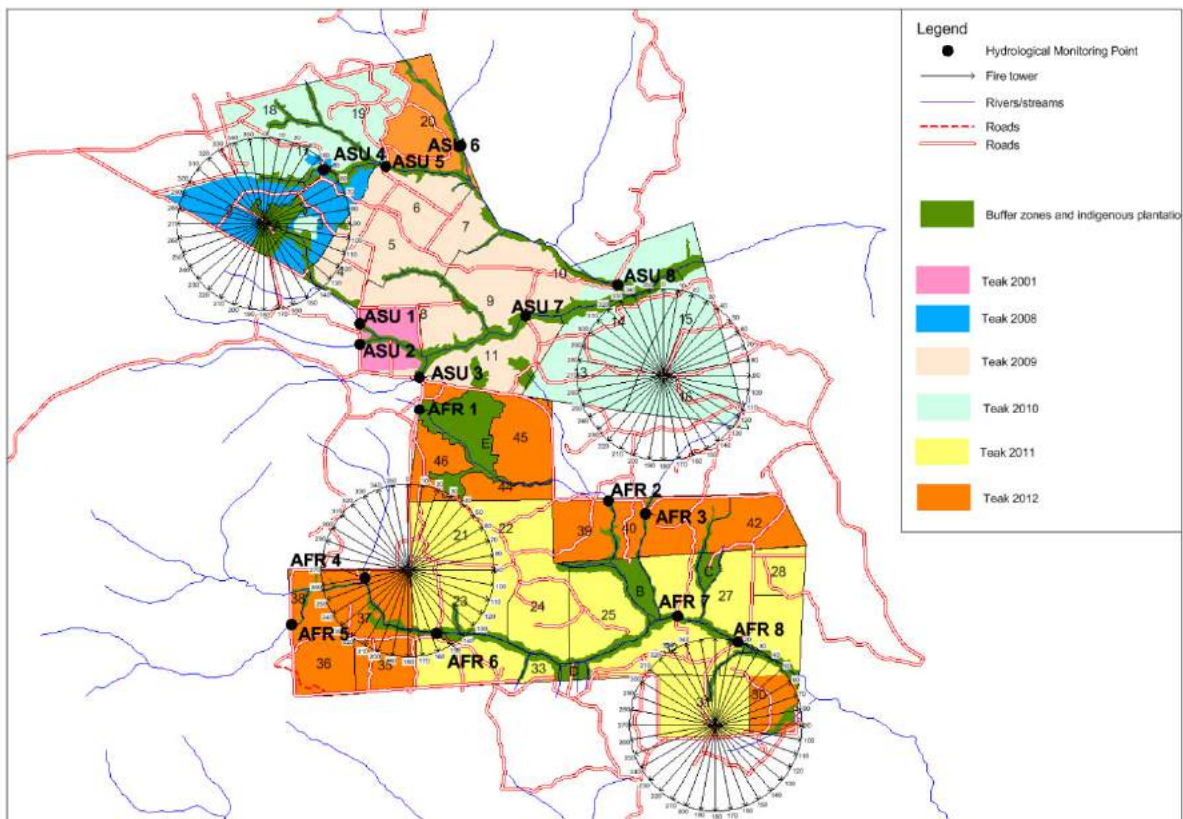


Figure 1: Points for the water monitoring in the Akumadan plantations

Table 5: Locations of the water monitoring points in the Akumadan plantations.

Location	X	Y	Alternative names / coordinates	Location description
Afrenso brohuma				
AFR 1	625116	817424		Stream enters the plantation
AFR 2	627535	816260		Stream enters the plantation - originates in the plantation
AFR 3	628004	816094	In February 2015:	Stream enters the plantation

Location	X	Y	Alternative names / coordinates	Location description
			30 N 628028 816132	
AFR 4	624425	815279		Stream enters the plantation
AFR 5	623488	814675		Stream enters the plantation
AFR 6	625344	814573		Stream in the plantation
AFR 7	628410	814791		Stream in the plantation
AFR 8	629187	814456		Stream exits the plantation
Asubima				
ASU 1	624356	818529	64ha N	Stream enters the plantation
ASU 2	624358	818265	64ha S	Stream enters the plantation
ASU 3	625120	817838		Stream enters the plantation
ASU 4	623903	820484	Natural bridge	Stream in the plantation - originates in the plantation
ASU 5	624689	820532	Block 20	Stream in the plantation - originates in the plantation
ASU 6	625643	820795		Stream enters the plantation - partly through plantation
ASU 7	626478	818618		Stream in the plantation
ASU 8	627657	819015		Stream exits the plantation

Table 6: Ordinary water monitoring results of February 2018

Location	pH	Conductivity in ppm	Temp (Celcius)	Turbidity (cm)
Afrensu Brohuma				
1				Water dried up
2				Water dried up
3				Water dried up
4	7.31	40.43	25.83	44.17
5	6.47	41.86	24.44	85.43
6	6.47	41.86	24.44	85.43
7	6.47	41.86	24.44	85.43
8	6.47	41.86	24.44	85.43
Asubima				
1	6.47	41.86	24.44	85.43
2	6.20	61.29	24.29	46.23
3	6.29	45.57	26.26	51.91
4	7.31	40.43	25.83	44.17
5	6.47	41.86	24.44	85.43
6	6.47	41.86	24.44	85.43
7	6.47	41.86	24.44	85.43

Location	pH	Conductivity in ppm	Temp (Celcius)	Turbidity (cm)
8	6.47	41.86	24.44	85.43

Table 7: Ordinary water monitoring results of May 2018

Location	pH	Conductivity in ppm	Temp (Celcius)	Turbidity (cm)
Afrensu Brohuma				
1				Water dried up
2				Water dried up
3				Water dried up
4	7.1	40.0	24.3	65.1
5	7.0	58.1	24.3	83.3
6	6.9	51.4	24.3	79.6
7	6.7	46.7	24.6	49.6
8	6.8	46.3	24.6	54.1
Asubima				
1	7.0	41.7	24.9	47.7
2	7.0	42.7	26.0	27.2
3	6.9	50.3	26.3	63.9
4	6.3	36.7	25.2	64.0
5	6.5	40.4	25.4	89.6
6	7.6	38.9	26.4	56.7
7	6.9	44.3	25.2	30.1
8	7.0	44.4	25.5	43.2

8.4 Development water characteristics in streams in Akumadan plantations

Table 7: Comparison data from 2011 with measurements 2018

No.	Parameter	Base line 9-11-2011	Year 1 (02-2018)
1	Dissolved Oxygen	66.9	3.5
2	pH	6.6	6.6
3	Temperature	26.1	24.7
4	Nitrate	0.3	0.2
5	Ammonia	-	13
6	Phosphate	0.4	0.1
7	Turbidity	FAU 20.4	FTU 6.1
8	COD	-	183
9	BOD	-	118

Explain variations observed:

The water contains less phosphate and Nitrate, whereas the pH is the same. It would seem water is cleaner now than it was 7 years ago. We will have to follow this closely to see if this

was a onetime effect or whether this is actually confirmed. Not all parameter were monitored in 2011.

8.5 Measures to improve on your performance (environmental Quality and Operation).

No new measures will be implemented. But as with all work in the natural environment continuous vigil is needed to keep up to the standards.

9. OTHER ENVIRONMENTAL MONITORING ACTIVITIES

9.1 Plantation monitoring

The objective of Form Ghana is to establish and manage the timber plantation in an ecologically, financially and socially sustainable manner. These management objectives are divided into criteria and for each criterion, a set of measurable indicators are determined as well as the means to verify them (Table 1).

Table 8: Monitoring framework

Management objectives	Criterion	Indicator	Verifier	Frequency of monitoring
1. Establish and manage the timber plantation in an ecologically sustainable manner with a maximum of 90% Teak and at least 10% of mixed local species with conservation of natural, riparian forest	1.1 Extent and condition of forest	1.1.1 Summarize National and international applicable requirements	list	Annual
		1.1.2 Area planted with Teak	Map	Annual
		1.1.3 Area managed as forest plantation / buffer zone	Map	Annual
		1.1.4 Changes in planted area	Map	Annual
	1.2 Biological diversity	1.2.1 Extent of area protected	Map	Annual
		1.2.2 Fauna population and diversity in the forest reserves	Report	Every 5 years
		1.2.3. Flora diversity in the buffer zones	PSP	Every 5 years
		1.2.3. Existence and implementation of procedures to identify / protect endangered, rare and threatened species	Procedures	Annual
	1.3 Forest health	1.3.1 Check of the growth rate of the plantation	PSP	Biennial
		1.3.2 Check of the growth rate of the Buffer zones	PSP	Biennial
		1.3.3 Monitoring of fire frequency	Fire report	Annual
	1.4 Soil protection	1.4.1 Procedures to protect soil productivity and avoid erosion	Procedures	Bi-annual
		1.4.2 Effectiveness of activities undertaken to avoid soil erosion	PSP	Bi-annual
		1.4.3 Procedures to avoid impact from work in the forest	Procedures	Annual
	1.5 Water protection	1.5.1 Procedures to protect forest and vegetation along water courses	Procedures	Annual
		1.5.2 Checking of water quality	Sample analysis	Bi-annual
		1.5.3 Water consumption	Measurements	Quarterly
	1.6 Status ESMP	1.6.1: Report on status of ESMP	report	Annual

Management objectives	Criterion	Indicator	Verifier	Frequency of monitoring
	1.7 Waste Management	1.7.1 Report on the waste management system	report	Annual
2. Guarantee financial and economic sustainability through the generation of income from the produced round-wood and carbon sequestration	2.1 Forest production	2.1.1 Harvest of round wood	Tables	Annual
		2.1.2 Comparison of yield with yield tables	Tables	Annual
		2.1.3 Calculation of current stored carbon in the plantation	Calculation	When needed
		2.1.4 Calculation of current stored carbon in the buffer zones	Calculation	When needed
	2.2. economic aspects	2.2.1. Cost benefit of plantation	Table	Annual
		2.2.2 Value of wood sales	Sales data	Annual
3. Provide social benefits by offering good economic conditions for employees and the surrounding smallholder community	3.1 Social benefits	3.1.1 Grievance and redress	Table	Quarterly
		3.1.2 Union and worker organisations	Table	Annual
		3.1.3 SEIMAP	report	Quarterly
		3.1.4 Number of people (partially) depending on the plantation for their livelihood (employees, inter croppers, out growers)	Annual report	Annual
		3.1.5 Training and capacity building for employees, inter croppers and out growers	Table	Monthly
		3.1.6 Information of the public	Website, stakeholder meetings	Annual
		3.1.7 Worker health / Accidents on work floor	Statistics	Monthly

9.2 Monitoring methods

List the techniques used and the results of each monitoring exercise.

9.2.1 *Biological diversity*

A fauna study has been undertaken Akumadan plantations. The small and medium sized fauna as well as bird fauna were inventoried by Prof. William Oduro of KNUST university. See report on website:

<http://www.formghana.com/login/upload/2017%20Biodiversity%20Monitoring%20Report%20Akumadan.pdf>

Document any presence related to any IUCN red-list animal (species, numbers, location, date, etc) (OS3);

None of the recorded species were of serious conservation interest on the IUCN Red List of Threatened Species (2017) or CITES schedules. However, the straw-coloured fruit bat (*Eidolon helvum*) is assessed as Near Threatened. Also, members of the Family Accipitridae (birds of prey) and Falconidae (falcons) are of special conservation importance in Ghana and are listed in Schedule 1 of the Ghana Wildlife Conservation Regulations (1995). Again, the African civet, common genet, cusimanse mongoose, bushbuck, Maxwell's duiker and members of the Family Columbidae (pigeons and doves) are of some conservation importance locally in Ghana and are listed as Schedule II species (Ghana Wildlife Conservation Regulations of 1995). Compared to previous surveys, there seems to be a decline of about 40% in number of mammalian species confirmed in the area. This could be due to the sampling moment (dry season as opposed to wet season in 2011). Most species were recorded in the forest buffers..

Document progress on buffer zone restorations/protection activities (OS3)

No new activities have been undertaken. Last monitoring dates from 2015. This showed that the protection measures are having a positive effect. Results from that study showed that in the buffer zones:

- The forest in the buffer zones of Asubima FR has shown development over the past 5 years to a more mature forest, with larger average height and DBH.
- The buffer zones in Afrensu Brohuma show typical characteristics of a disturbed forest that is now rejuvenating, with a large number of small trees and a small number of large, mature trees.
- A number of species identified in the buffer zones is classified as 'vulnerable' by the IUCN Red List: *Nesogordonia papaverifera*, *Entandrophragma cylindricum*, *Khaya anthotheca*, *Coffea togoensis*, *Hallea ledermannii*.
- The Genetic Heat Index of Asubima FR has increased since 2010, emphasizing the need for conservation of the buffer zones.

Document changes in floral diversity in the buffer zones (OS3)

No changes perceived

Document changes in mammal and bird diversity (OS3)

Out of about seventeen (17) mammal species confirmed to be present in the area in 2010-2011 (De Laat, 2010; Manu, 2011 and Quansah 2011), only ten (10) were recorded in 2017-2018 including one bat species. This suggests that about forty percent of the previously identified species were not recorded. Species like brush-tailed porcupine, Mona (Lowe's) monkey, marsh mongoose, African palm civet, tree pangolin, Togo hare, warthog, bay duiker, tree hyrax and striped ground squirrel were not confirmed in the present survey. Due to the dry season monitoring, it is very likely that fewer signs were observed of the presence of animals and also that many animals were scared away at quite a distance from the monitoring team due to the crackling of dry

litter. Many of the species not confirmed in the study are occasionally observed by Form Ghana workers.

9.2.2 Forest health

Document any incident on pest occurrence and pollution (OS4)

In Akumadan a rootrot occurs in the pilot plantation. A review was done in the field to assess the seriousness of this affliction. It became apparent that 0.6% of the trees in block 1 has fallen over due to root rot. Another 1.3% are dead standing. With these percentages it is possible to complete the normal growing cycle of the teak without significant loss. The dead and toppled trees will be removed from the plantation for sales. A cooperation with Wageningen University and Research is in the making to study this problem in more detail.

9.2.3 Protection against fire

Table 9: Report on fire management and incidence

	Akumadan		Berekum	
	Inside	Outside	Inside	Outside
January	1	131	0	27
February	1	144	1	195
March	0	108	0	180
April	0	21	0	109
May	0	4	0	283
June	0	1	47	87
July	0	0	15	79
August	0	0	17	233
September	0	5	9	174
October	0	8	0	57
November	0	16	2	168
December	2	406	0	111
Total	4	844	91	1703

In Akumadan four fires occurred, one in January, one in February and two in December. No real damage was done.

9.2.4 Soil protection

Report on observed soil erosion and possible other soil problems

No soil erosion was observed in the plantation. Monitoring of all the PSP in the teak part of the plantation has been done. Observations on soil erosion were part of this monitoring. No particular erosion was encountered.

9.2.5 Status ESMP

Implementation status of the ESMP, specifically highlighting if there are non-compliance items.(OS1)

Implementation status of the ESMP, specifically highlighting if there are non-compliance items.(OS1)

In case of deviation or non-compliance with applicable requirements, specify the actions taken or to be taken to ensure compliance (for all applicable OSs)

The ESMP is relevant at two levels. The ESMP as submitted to AfDB is fully operational. There was however also a legal requirement to submit an ESMP to the EPA. The EPA did not accept the same document as submitted to the bank as sufficient for their ESMP requirement. New documents were developed for the Akumadan and the Tain II plantation, submitted and accepted. The environmental permits issued based on these documents are valid until the 14th of August 2021.

9.2.6 Rainfall

Update the table with rainfall data

Table 10: Rainfall data Akumadan

Nursery	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	0	0	43	110	125	222	138	25	112	125	64	0	964
2010	0	54	50	184	119	162	309	63	136	258	28	27	1390
2011	8	48	65	51	128	339	67	38	257	241	0	0	1241
2012	0	33	75	106	229	128	67	8	25	253	64	13	1000
2013	0	73	97	64	189	59	123	25	249	97	27	4	1005
2014	15	26	129	181	125	197	60	94	198	145	88	0	1256
2015	0	101	53	98	83	104	107	0	118	174	29	0	1258
2016	0	33	90	109	153	82	87	2	249	144	10	13	972
2017	0	5	82	127	141	194	104	84	197.5	91	66	5.5	1097
2018	0	61	88	186	177	143	155	137	188	124	84	0	1342
Tower 1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	11	31	13	56	93	254	69	57	246	349	0	0	1178
2012	0	31	62	120	162	168	87	9	25	223	75	45	1007
2013	0	86	132	85	178	55	121	9	214	129	71	0	1080
2014	12	27	104	171	114	158	65	81	166	133	89	0	1118
2015	0	94	66	104	56	89	108	4	115	200	35,5	0	1120
2016	1	35	81	95	152	60	84	13	227	151	20	1	920
2017	0	8	83	135	137	185	124	97	184	104	40	1	1098
2018	0	82	108	146	167	189	152	118	165	148	30	0	1304
Tower 2	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	7	22	13	91	136	207	85	118	242	216	0	0	1137
2012	0	45	97	145	187	102	111	0	85	183	84	38	1076
2013	0	119	142	90	137	49	133	16	191	94	60	0	1029
2014	25	15	110	302	84	201	74	183	152	173	131	0	1448
2015	0	119	144	93	49	103	96	5	89	194	36	0	1450
2016	2	13	68	112	112	36	90	14	223	140	39	5	854
2017	0	15	120	142	170	185	104	120	149.5	43	39	24	1111
2018	0	94	96	97	169	149	142	96	104	185	11	0	1142

Tower 3	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2012	0	45	75	130	180	142	111	0	9	162	92	13	958
2013	0	72	102	101	138	59	200	5	236	95	57	0	1065
2014	26	24	62	235	110	130	72	109	112	117	101	0	1098
2015	0	132	97	80	54	106	96	0	80	170	34.5	0	1098
2016	1	18	98	105	92	58	72	15	238	139	55	0	891
2017	0	12	105	217	142	201	161	167	131.6	56	21.5	35	1249
2018	0	78	124	105	230	133	144	68	130	174	12	0	1198
Tower 4	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2012	0	0	0	0	0	0	0	0	0	98	97	2	197
2013	0	35	183	197	196	92	199	21	307	82	102	0	1413
2014	24	27	114	162	66	167	26	71	171	136	73	0	1037
2015	0	73	99	112	58	138	79	0	104	203	54.5	0	1037
2016	8	23	121	158	115	29	81	17	213	116	27	15	923
2017	0	27	149	185	145	215	94	170	100.1	51	18	6	1160
2018	0	79	106	92	150	127	130	71	81	176	13	0	1025

9.2.7 Forest production

848 m3 were harvested this year

9.3 Economic aspects

Present sales made and benefit sharing paid

A contract was signed with Beghap company limited in Ghana to sell them timber from thinnings. A volume of 751 M3 of timber was harvested from compartments 1,2, 4, 5 & 12. For this timber a sum of 11,681.04 GHC has been paid to the forestry commission. This is the benefit sharing which is distributed to the traditional land owners and communities by the forestry commission.

9.4 Social benefits

9.4.1 Grievance and redress

Reporting on any complaints that have been received by the company through the internal workers grievance system (OS5)

Review of grievance and redress mechanism (number of cases; number resolved; type of cases; method of resolution and level) (OS2)

Table 11: Grievance and redress overview

Case number	Date filed	Relation to FG (e.g. Worker, stakeholder, etc.)	Topic	Level	Reaction FG -> complainant	Date reaction	outcome / proposed solution	Status (ongoing / resolved)
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Case number	Date filed	Relation to FG (e.g. Worker, stakeholder, etc.)	Topic	Level	Reaction FG -> complainant	Date reaction	outcome / proposed solution	Status (ongoing / resolved)
AKU 2018 - 001	26-jan-18	Worker	Number of Leave days	2	To be sent for response (January Union Monthly meeting)			
AKU 2018 - 002	26-feb-18	Worker	Prosper complained that his co workers were given new chainsaw machines while he (Prosper) was not given	Chainsaw operator	Date was scheduled for the complain to be resolved.	28-feb-18	It was discussed and concluded that he (Prosper) spoiled two chainsaw machines in one month. Also requested too many chainsaw items as expected. Therefore management decision was he should improve on the use of the chainsaw machines before he can be provided a new machine	Resolved
AKU 2018 - 003	27-4-2018	Worker	Management should hire a vehicle to transport workers to the funeral in time of death of a co-worker instead of selecting 5 to 15 workers to represent the company.	2	MD Responded	27-apr-18	HR and Union should make an arrangement in accordance with the CBA and all proposals should be in line with it	Resolved
AKU 2018 - 004	27-4-2018	Worker	Management should assist workers financially when they come with dependence hospital bill for refund	2	MD Responded	27-apr-18	HR and union should look at things that have big impact on workers and propose during the CBA update	Resolved
AKU 2018 - 005	27-4-2018	Worker	Workers who perform the difficult task should be motivated. Example is the road team.	2	MD Responded	27-apr-18	Discussion is in progress	Ongoing
AKU 2018-006	27-4-2018	Worker	Though in 2017 there was no fire in Akumadan's plantations, workers in Akumadan were affected with reduction in bonus percentage to 30%.	2	MD Responded	27-apr-18	Though there was no fire in Akumadan's plantation, but in January 2017 the workers attitude (commitment) to fight fire changed, that attitude is unacceptable and that led to the reduction.	Resolved
AKU 2018 - 006	30-mei	worker	The worker complained that management should kindly consider him by increasing his basic salary as towed grader operator since 2009 till date.	2	All salary increments were made effective March, 2018. However, No salary would be increase this year.	1 st June, 2018	Satisfied	Resolved
AKU 2018 - 007	27-jul-18	Permanent Worker	A worker pleaded with management to grant workers		To be sent for response (July Union Monthly meeting)			Ongoing

Case number	Date filed	Relation to FG (e.g. Worker, stakeholder, etc.)	Topic	Level	Reaction FG -> complainant	Date reaction	outcome / proposed solution	Status (ongoing / resolved)
			leave when their daughters give birth so they can take care of their daughters and grandchildren.					

9.4.2 Unions

Provide summary table of workers organizations, description of member category, number of members (OS5)

Union Organisation – **Timber and Woodworkers Union of Ghana Trade Union Congress (TWU/TUC)**

Table 12: Union membership

No. of Males	No. of Females	Total No. of workers
222	90	312

9.5 Economic Impact Mitigation Action Plan: Update second quarter

During the second quarter an updated SEIMAP document was shared with the bank and discussed. Some final modifications were made and the updated version now serves as the basis for reporting (version June 2018). It was decided not to repeat the contents of the report in this section but to report on progress only.

A new request from the Bank was to only report in one of the E&S quarterly reports. It was decided to do this in the Tain report. No further information on the RAP is disclosed here.