



Environmental & Social Monitoring Annual Report 2017 Tain II 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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INTRODUCTION

This is the report on social and environmental performance of Form Ghana during the fourth quarter of 2017. The report is produced to comply with the requirements on reporting of the African Development Bank.

1. COMPANY PROFILE

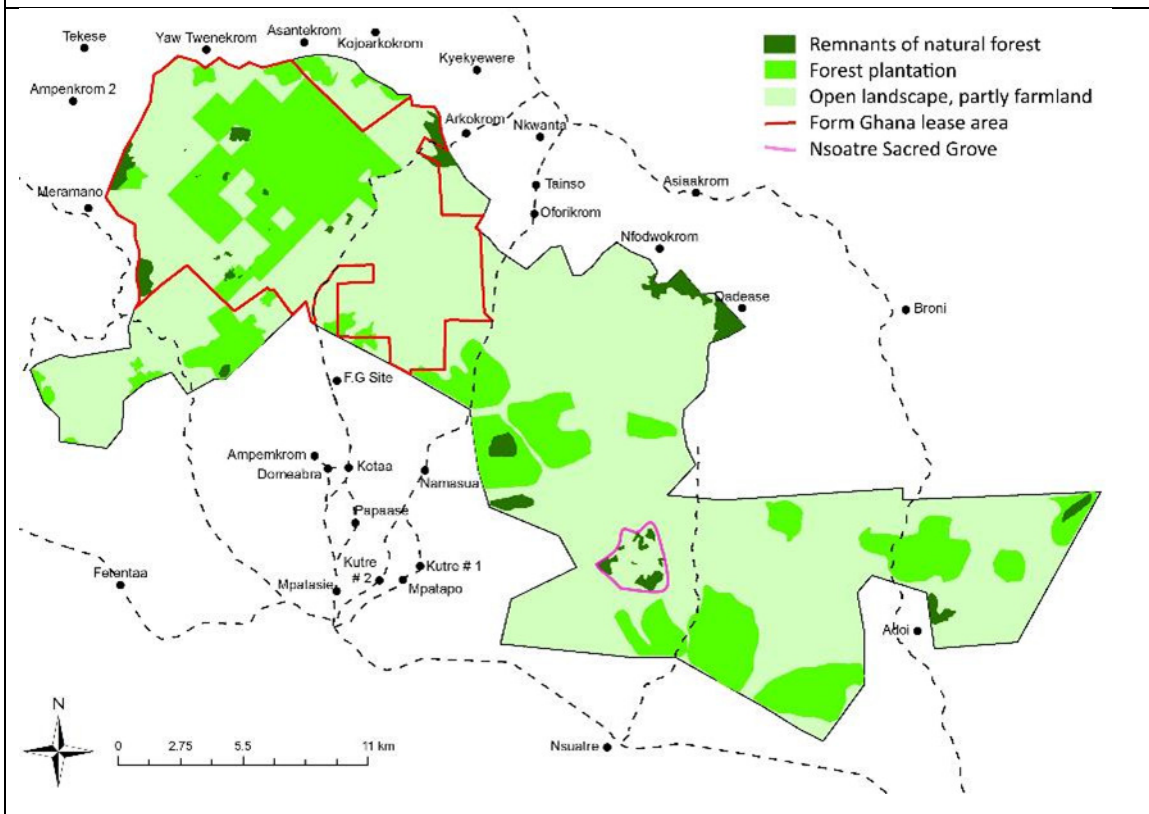
EPA #	Information required	Information provided					
1.1	Name of Company	FORM GHANA LTD					
1.2	Type of Undertaking	Reforestation / Forest Management					
1.3	Year of establishment of project	2012					
1.4	Location	Tain II FR, Brong Ahafo					
1.5	Contact Person:	Mr. W.A. Fourie Position: Managing Director					
	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 form the following institutions?:						
No	Institution	Permit		Permit No / License No / Date of issue /Expiry			
		Yes	No				
1	Environmental Protection Agency	X		CF00620102 exp. 13-03-2017			
2	Water Resources Commission	X		FGLID 421 / 16 exp. 31-12-2018			
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)	↑4 - ↓4	↑2 - ↓1	↑6 - ↓5	↑8 - ↓7	↑1 - ↓1	↑9 - ↓8	↑15 - ↓13
Sunyani(HQ) C	-	↑1 - ↓1	↑1 - ↓1	-	-	-	↑1 - ↓1
Akumadan P	↑85 - ↓64	↑44 - ↓43	↑129 - ↓107	↑12 - ↓9	↑2 - ↓1	↑14 - ↓10	↑143 - ↓117
Akumadan C	↑129 - ↓4	↑174 - ↓2	↑303 - ↓6	-	-	-	↑303 - ↓6
Berekum P	↑103 - ↓94	↑33 - ↓30	↑136 - ↓124	↑18 - ↓17	↑4 - ↓3	↑22 - ↓20	↑158 - ↓144
Berekum C	↑441 - ↓46	↑176 - ↓11	↑617 - ↓57	-	-	-	↑617 - ↓57
G.T	↑762 - ↓212	↑430 - ↓88	↑1192 - ↓300	↑38 - ↓33	↑7 - ↓5	↑45 - ↓38	↑1237 - ↓338
Permanent staff (P) Casual Staff (C)							
↑441 highest value for 2017 ↓46 lowest value for 2017							

2. SITE DESCRIPTION

EPA #	Information required	Information provided					
2.2	Location and major landmarks	The Tain II Tributaries forest reserve is found in the Brong Ahafo region close to the border with Ivory Coast. The Reserve is found south of the River Tain, which constitutes most of its northern border. To the south the town of Berekum is found.					
2.3	Geographical Coordinates of Concession	The plantations are located within the Tain II Tributaries Forest Reserves in Berekum District, in the Brong Ahafo Region. Coordinates (WGS 84 - UTM) for the reserves are:					
	Point	X-coordinate Y-coordinate					
	1	538.389,80 848.675,76					
	2	551.079,34 846.983,81					
	3	552.831,69 837.859,44					
	4	543.767,75 836.409,21					
	5	536.274,87 842.995,68					
2.3	Total land take of concession	14576 area					
2.4	Actual Area Forested	5016,34 Hectares					
RESERVE	LEASE AREA (ha)	YEAR (ha)	TOTAL AREA (ha)	INDIGENOUS (ha)	TEAK (ha)	UNPRODUCTIVE (ha)	AREA PER RESERVE (ha)
Tain II	14576	2013	637,1	19,1	618		14576
		2014	2098,9	194,7	1904,2		
		2015	1575,3	91,8	1483,5		
		2016	87,6		87,6		
		2017	610,9	62,9	548,0		
			5009,8	368,5	4641,3		
2.5	Area under conservation	386.5 hectares					
	Type of conservation: strict	0 hectares					
	Type of conservation: partial	368.5 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	Civet, Cusimanse Mongoose, Genet, Marsh Mongoose, Brush-tailed Porcupine, Giant Rat, Grasscutter, Ground Squirrel, Bushbuck, Maxwell duiker, Red River Hog, Royal Ante-					

		lope
	Birds:	Sixty (60) species, belonging to 23 families were recorded on transects (Table 13 and Appendix F). More than 10% of the species recorded belongs to the Weavers and Malimbés family (Ploceidae). Other families included Flycatchers (Muscicapidae), Bulbuls and Greenbuls (Pycnonotidae) and Pigeons and doves (Columbidae) with a record of 8% of the species each. The White-throated Bee-eater (relative abundance of 13.861), Black-winged Bishop (7.129), Red-eyed Dove (5.743), Common Bulbul (4.752), Zitting Cisticola (4.752), Viellot's black Weaver (3.960) and Grey-backed Cameroptera (3.960), were the most recorded and widespread bird species. The Families Alcedinidae and Accipitridae accounted for about less than 1% of the specimen recorded and also produced the least number of species. Most bird species were recorded in the forest vegetation (38), followed by degraded areas (33), teak plantations (21) and then farm-lands (19)
2.6	List any Rivers / Streams traversing or within 100 m of the concession:	Tain river forms the northern border. Some affluents find their source inside the reserve in the wet season. They do not carry water in the dry season. One such affluent is the Owusutaka.
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:	The villages close to the reserve are : Akrofo, Arkokrom, Asantekrom, Dadease, Domeabra, Ampenkrom, Kojoakokrom, Kotaa, Kutre 1, Kutre 2, Meremano, Mpatapo, Mpatase, Namasua, Nfodwokrom, Oforikrom, Pepaase, Tainso. These villages are all found within 10 kilometers from the Tain II reserve.
2.8	Adjacent land Uses:	North: Agriculture South: Agriculture East: Agriculture

		West: Agriculture
2.9	What ancillary facilities do you have on site:	<p>The site has the following facilities:</p> <ul style="list-style-type: none"> • 1 staff house, • 1 guesthouse • 2 office blocks • 1 workshop • 1 training centre • 1 canteen • 1 store • 1 fuel station • 1 sanitary block • 4 lockable sea containers (as stores) • 1 guard house • 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 Berekum is about 10 kilometres. Some villages are within a distance of 1 kilometre.



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	4646.56	93%
Indigenous (Ofram, Awiemfosamina, Kokrodua, Potrodom, Onyina, Emeri, Watapuo	Own nursery	369.69	7%
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 at Akumadan and at a rain fed nursery inside the plantation area. 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 decompose 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. Quantities given is for 2017 until end of September.			
	Type	Source	Quantity / Annum	Mode of application
1	Kalach (Glyphosate)	Dizengoff, Accra	5635 kg	Droplet applicator (Mankar)
2	Rival (glyphosate)	Wienco RMG	4388,6 litres	Droplet applicator (Mankar)
3	Blasta (Glufosinate Ammonium)	Wienco RMG	786,8 litres	Knapsack sprayer
3.2.4.	What area of land has been planted for the year under review	This year 610,9 hectares have been planted of which 62,9 hectares with indigenous trees.		
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:	Tain II Tributaries Forest Reserve / Teak plantation		

3.3.2	Type of forestry product harvested:	None in Q4 2017
3.3.3	Quantity of forest product collected or harvested per annum	None in Q4 2017
3.3.4	State the purpose of the forest product:	N/A
3.3.5	How do you collect or harvest these products (mechanism	Until 2033 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:	No extraction in Q4 2017

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 2017 were 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 were to have no work related disease and no serious work related injuries in 2017

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

Environmental objectives for 2017 were 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 were to have no work related disease and no serious work related injuries in 2017

5. ENVIRONMENTAL MANAGEMENT ACTIVITIES

EPA #	Information required	Information provided
5.1	What type and quantities of waste does your operation generate e.g. liquid, farm waste (plastics) List them: a) solid	<ul style="list-style-type: none"> • 84 used tires • 12 car batteries • 4 tonnes of plastic bags • 5 tonnes of plastic bottles
	b) liquid	<p>Liquid waste concerns mostly used engine oil.</p> <p>Volume produced in 2017 was 2926 litres</p>
5.2	How do you manage the waste streams listed in 5.1. above)handling, treatment and disposal	See protocol 4
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	Weeding is an intensive operation which takes place 2 to 3 times a year. The terrain is weeded manually with cutlasses twice and weeded chemically once.
	c) practises employed to conserve biodiversity	Bio diversity 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 undertaken (mulching, erosion control, etc.).	Form Ghana protects the soil through reforestation practises and erosion control. Erosion control mainly takes place

EPA #	Information required	Information provided		
		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?	No diseases or pests were detected in Tain II in 2017		
b	How were the diseases / pests managed?	No management needed, as there were no pests or diseases.		
c	Practises employed to manage admitted farms:	The admitted farms are not all inhabited. They do however present a potential fire risk. Form Ghana ensures that the admitted farms are managed in such a way that no fire will come from there.		
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. Form Ghana believes in the build-up and maintenance of good relations with the communities and has several protocols to help staff with the interaction with the communities.		
e	Practises employed to manage livestock grazing / fire	Life stock grazing is a threat in the Tain II Reserve. Interaction with community leaders, officials and the forestry commission has led to sensitisation and action for the eviction of herds of cattle from the reserve. 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	Kalach (Glyphosate)	5635 kg	Containers kept on site / no left over product	None
2	Rival (glyphosate)	4388,6 litres	Containers kept on site / no left over product	None

3	Blasta (Glufosinate Am- monium)	786,8 litres	Containers kept on site / no left over product	None
3.7 b	b) Management practises in place to prevent / control discharge of chemical; con- taminants into the environ- ment:		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 Q3:			
Fuel Type	Diesel (litres)		Petrol (litres)	
	Akumadan	Berekum	Akumadan	Berekum
Total	23354.5	83897	6266.8	7450
	Power:		The power for the site was generated by own solar cell system.	
5.9	Explain the variation (in- crease / decrease) in trend:			

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 - 2016		
DATE	TOPIC	PARTICIPANTS
5/12/2016	Forest fire fighting	8
5-6/12/2016	Forest fire fighting	119
4-5/01/2017	Singling	122
19/01/2017	Flu	335
23/01/2017	Introduction to forest fire fighting	27
24/01/2017	Techniques in fire line construction and usage and storage canvas hosepipe	52
25/01/2017	Role of fire crew leaders in fire fighting	15
26/01/2017	Practical use of canvas hosepipe	24
27-28/01/2017	Basic incident command system	8
7-9/03/2017	Baseline construction	43
20,27/03/17	Pegging	71
23-24/03/17	FSC Chain of custody	2
28/03/17	Workplace of hygiene	152
30/03/17	Tally ERP9	3
31/03/17	First aid training	12
5-7/04/17	Technique in burnt teak cutting	10
5/04/17	Chemical weeding using knapsack	35
7-11/04/17	Burnt teak cutting	14
21/04/17	Waste management	14
21/04/17	Security issues	18
26/04/17	First aid training	2
28/04/17	Security issues	15
3/05/17	Layout for bed construction	11

3/05/17	Beds construction	12
4/05/17	Teak seeds sowing	19
15/05/17	Training of quality and stock controllers	8
15/05/17	Physical planting of indigenous plants	24
15,16/05/17	Physical planting of teak stumps	81
24/05/17	Teak stumps harvesting	17
15,17/06/17	Marking for thinning	4
30/06/17	Company internal rules and regulations	99
3-14th July	Basic Chainsaw	10 – Permanent
		5- Casual
4-7th July	Training in Land Demarcation	5 - Permanent
11-14th July	Chemical Weeding using Knapsack and Mankar	20 - Casual
14-19th August	Foremen Training	11 – Permanent
21-26th August	Work study Training	1 - Permanent
21-25th August	Fire Simulation and Skills Development	18 - Permanent
		20 - Casual
24-25th August	Nursery Monitoring	3 - Permanent
15-16th Sept	Singling	100 - Casual
22nd Sept	Typhoid Fever	98 - Permanent
		397 - Casual
26-27th Sept	Marking for Thinning	6 - Permanent
29th Sept	Transport of Personnel	19 - Permanent
9/28-10-2017	Advanced fire management and commercial reforestation management	14
20-11-2017	Forest fire fighting	28
24/29-11-2017	Thinning	14
27/30-11-2017	Forest fire fighting	56
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	National Health Insurance Scheme of Ghana

	If yes, name scheme	
	Do you have the following? Washrooms:	Yes
	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		2017
Workers		578
Medical attention		2792
Interventions / person		4.8
<p>During 2017, medical treatment has been issued 2792 times in Berekum. The number of treatments per person is 4.8 times. The main disease encountered is musculoskeletal pain (507) and treatments were given to people with malaria (348), cough (324), headache (316), stomach (248), wounds (169), diarrhea (155), giardiasis/helminthiasis (91), eye (91), gastroenteritis (69) and pregnancy (2). A total of 134 cases were referred to hospital for further treatment. Typical work related injuries were reported 232 times mainly insect bites, cut and leg swelling resulting from slipup.</p>		
6.5	Did you record any accidents during the year? If yes indicate the type(s) of accidents and frequency:	One serious accident was recorded during 2017.
6.6	What accounted for these accidents?	A truck bringing people back to site at the close of work stalled when going up a hill and reversed. Some people jumped off and two of these were hit by the truck. They have died.
6.7	How were the accidents managed?	An investigation was carried out by the police and by company technicians.
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	
<p>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.</p>		

One stakeholders' meeting was held in Berekum in 2017. The main subjects discussed at the meeting were; New developments with Form Ghana, fire in the plantation, Form Ghana's activities, and social issues.

Besides the stakeholders' meeting, several community and farmers' meetings were held to discuss about intercropping activities and fire education.

Form Ghana has signed an intercropping agreement with 500 farmers as at the end of 2017.

The number is expected to increase as plantation establishment continues.

Fire education was given in and around the Form Ghana areas. As the use of fire has become part of their lifestyle, all communities were advised to use fire with great caution. Community members were advised not to leave any fire unattended even before leaving farms for their homes. Recalcitrant members are to be reported to the appropriate authorities for sanctioning redress. Form Ghana assists farmers to burn their farms during land preparation in what FG calls the "Farm Land Incineration Aid".

In general, the communities expressed great appreciation for the collaboration during the yearly fire education program in the communities and also promised to keep fire out of the communities and the forests.

Form Ghana is linked to the communities through the benefit sharing agreement which stipulates that a percentage of the benefit sharing will go to the communities (through the district council).

7. SOCIAL MONITORING PERFORMED DECEMBER 2017

An annual social monitoring is performed to see how communities fare and how the communities perceive Form Ghana.

Results of social survey	<p>Positive Impacts:</p> <ul style="list-style-type: none"> • Employment for community members; permanent (156) casual and contract workers (569) • Reduction in wild fire outbreak • Maintenance of roads to some immediate communities <p>Expectations:</p> <ul style="list-style-type: none"> • Support and strengthen local fire volunteer squad in the form of trainings, provision boots, cutlasses and an identity defining item (e.g. shirt, uniform or badge) to help perform their duty. • To construct or aid in the construction of a bridge over the Tain River into the communities. • Build a clinic • Construct a community center • Drilling of bore holes for the community • Road to connect the reserve and the communities • Storage structure for harvested farm produce • Demarcate a strip of land in the reserve along its boundaries to the communities for farming • Release of some of FG's vehicles to help convey harvest (maize) from plantation to its boundary <p>Concerns:</p> <ul style="list-style-type: none"> • Plantain and cassava should be allowed in the intercropping scheme • Conveying harvest from plantation to the boundary to be dehusked is difficult because of inadequate number of hiring vehicles
Social projects (Overview, Reports)	An ablution (toilet) facility was handed over to Kotaa community.

Reports / minutes of stakeholder meetings

One stakeholder's meeting was held in 2017. This was on July 21, 2017.

8. ENVIRONMENTAL MONITORING

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

This information is yet to be generated

Report on water quality (OS4)

This information is yet to be generated

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

Pump ID	Location	Capacity	Total volume pumped 2017	Action time
Ground FOS	Site Berekum	2Hp	3,243,000m ³	Daily
Ground FOS	BII Berekum	1 Hps	840m ³	Daily
Ground FOS	B46 Berekum	1.5Hp	0	
Xtra	Site Akumadan	2Hp	2,754m ³	Daily
Saer	Site irrigation Akumadan	30Hp	572,274,720m ³	Daily

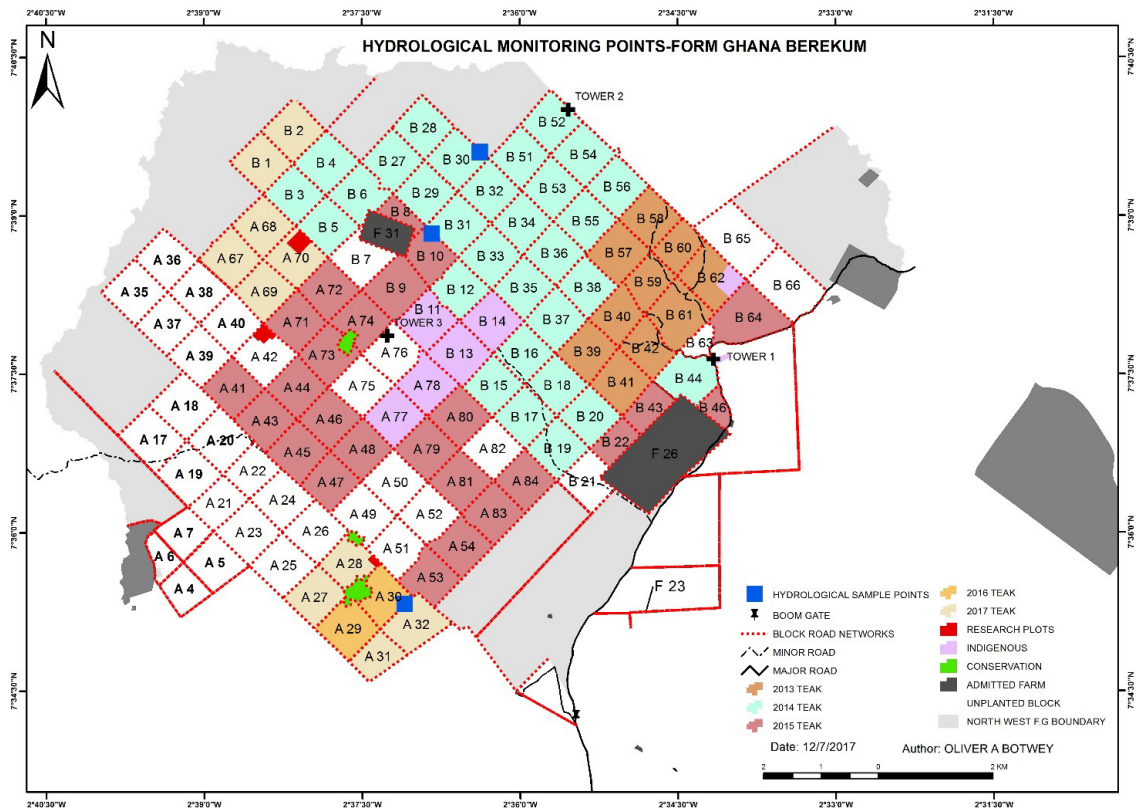
7.1. Water Quality Monitoring Data (complete the table below) if applicable. Provide coordinates of sampling points.

The restoration of the 30 meter buffer zones along the water courses is expected to reduce erosion and prevent chemicals/sedimentation of streams. Measurements done at the various sampling points in June 2017 show that; water has a lower turbidity and lower total dissolved solids (TDS). Dissolved solids refer to any minerals, salts, metals, cations or anions dissolved in water. Total dissolved solids (TDS) comprise inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulphates) and some small amounts of organic matter that are dissolved in water. TDS is an indicator of general quality of the water. High TDS values may be associated with influx of waste-water or agricultural run-off. According to WHO drinking water guidelines, the palatability of water with levels below 600ppm is generally considered to be good. The average conductivity values at all sampling location show the water quality is good. Conductivity shows the presence of heavy metals in water. The value measured at the various sampling station/point shows the presence of heavy metal may be low.

Results of water sampling analysis

Sampling point	PH		Conductivity/ms		TDS		Temperature		Turbidity	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
SP1	6.9	0.19	0.2	0.00	215.8	4.8	26.4	0.07	48.4	7.3
SP2	6.9	0.34	0.2	0.00	165	2.7	25.9	0.1	49.5	1.7
SP3	6.7	0.1	0.2	0.00	163.1	0.69	26.7	0.1	46.8	1.9

Map of Form Ghana showing water sampling points



7.2 Explain if values were not provided

Form Ghana had its own way of monitoring and the information required by the EPA will yet need to become part of the monitoring system.

7.3 Use the table below to determine variations (trends) between the baseline and current values of rivers that traverse the farm:

No.	Parameter	Base line	Year 1	Year 2
1	Dissolved Oxygen			
2	pH			
3	Temperature			
4	Nitrate			
5	Ammonia			
6	Phosphate			
7	Turbidity			
8	COD			
9	BOD			

Explain variations observed:

8.0 Indicate measures to improve on your performance (environmental Quality and Operation).

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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).

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	
1.7 Waste	1.7.1 Report on the waste	report	Annual	

Management objectives	Criterion	Indicator	Verifier	Frequency of monitoring
	Management	management system		
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 *National and international applicable requirements*

Summarize National and international applicable requirements

9.2.2 *Biological diversity*

Present the results form biodiversity monitoring with emphasis on:

Since the baseline inventories no monitoring of biological diversity has taken place. This is foreseen for 2018.

- Document any presence related to any IUCN red-list animal (species, numbers, location, date, etc) (OS3);
No new survey.

- Document progress on buffer zone restorations/protection activities (OS3): Indigenous planting has reached 370 hectares in total
- Document changes in floral diversity in the buffer zones (OS3)
No new survey
- Document changes in mammal and bird diversity (OS3)
No new survey

9.2.3 *Forest health*

Document any incident on pest occurrence and pollution (OS4)

No incidents or pests were recorded.

9.2.4 *Protection against fire*

Report on fire management and incident;

No fires were reported inside the plantation during the last quarter. Preparations for the coming dry season have been going on however. This concerns the repair and addition of equipment and the training of the fire response team. Next quarter the sensitization of the surrounding communities will commence. Also a new automated camera surveillance system has been is

Month	Fires outside	Fires inside
January	31	0
February	121	2
March	439	0
April	284	0
May	1	0
June	0	0
July	24	0
August	107	0
September	77	0
October	10	0
November	14	0
December	20	0
Total	1128	2

9.2.5 *Soil protection*

Report on observed soil erosion and possible other soil problems

No soil erosion was observed in the plantation.

9.2.6 Status ESMP

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)

ESMP's were submitted to EPA. EPA furnished comments to FG to adapt the ESMP's. New versions were submitted to EPA and are under scrutiny.

9.2.7 Rainfall

Rainfall in 2017 seems to end up being higher than in other years. This is good for both tree growth and for the fire risk.

Main Gate	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2014	40	0	119	162	62	150	40	33	54	67	17	0	744
2015	0	71	22	144	116	91	66	49	79	240	44	0	922
2016	0	0	53	48	90	120	24	34	96	171	15	42	693
2017	0	8.5	61	80	116	254.3	81	76	148	130	105	0	1059.8
Tower 1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2013	0	45	79	86	148	44	93	10	228	83	114	0	930
2014	40	0	119	162	62	179	79	110	120	157	5	0	1033
2015	0	70	64	109	115	56	17	96	108	159	23	0	817
2016	0	10	17	55	115	57	52	22	197	138	16	35	714
2017	0	4	49	126	121	278	160	82	145	166	21	0	1152.6
Tower 2	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2015	0	600	75	114	172	37	72	114	131	204	16	0	995
2016	0	0	61	125	198	115	75	23	199	56	37	30	919
2017	0	1	77	92	151	300	130	127	163	128	16	0	1185.4
Tower 3	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2015	0	70	41	117	164	65	47	64	84	155	16	0	823
2016	0	0	60	81	109	187	37	5	164	98	69	57	867
2017	0	6	65	74	80	321	91	89	153	129	130	0	1021

9.2.8 Forest production

No timber was harvested in Tain II

9.3 Economic aspects

No timber was harvested Tain II

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)

Type of Cases	Number of Cases	Number resolved	Level
Workers PPEs and ID card	2	1- resolved 1-ongoing	2
Workers Salary	2	2	2
Workers condition of service (Tower conditions)	6	4- resolved 2-ongoing	2
Fair Treatment of workers	3	3	2- 2 cases 3 – 1 case

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)**

No. of Males	No. of Females	Total No. of workers
169	73	242

9.4.3 Socio-Economic Impact Mitigation Action Plan for November 2017

Progress and impact of SEIMAP (quantitative and qualitative) (OS5)

9.4.4 Update priority

Since august 2017 much work has gone into updating the information on the project affected people:

- We have updated the number of households and number of buildings. There are now 9 families that will move to Kotaa. All families have already vacated the plantation. The families that have indicated that they will no longer move to Kotaa, have indicated they are no longer interested in moving to Kotaa.

- We have updated the information on the farmers in Tain, and the number of hectares currently under intercropping agreement and available for intercropping including how many farmers have received a 2 year contract and how many a 5 year contract. This part of the RAP has already been implemented and has been reported upon to AfDB in September 2017.
- We still need to update on the Fulani situation. How many head of cattle, how many herders, current routes for grazing and to water points.
- We have updated the plans with the host community (Kotaa) in order to ensure a proper welcome of the new settlers. Facilities have been installed or contracts have been signed for the construction of facilities.
- The land where the PAP from Akumadan will build their houses and will stay has been purchased and the current occupiers have been compensated.

9.4.5 Update discussion PAP

Interviews were held to find out the sizes of the families that will be moving to Kotaa. Nine families will move to Kotaa. Most will move with the whole family, some will move only with the younger children. All people will collect thatch in the vicinity of Akumadan as they think this grass is of better thatching quality than grass found around Kotaa or in Tain II. The grass used is *Imperata cylindrica*, which is an indicator of degraded soils. The summary table below is a result of the interviews with the people that were held during October with the questionnaire presented in annex G

No	Name	move to Kotaa?	Number of people	goods to move
1	Nsobile Amgyzon	yes	7	thatch, wood, utensils, fowl, goats, sheep and luggage
2	Stephen Donanaa	yes	6	2 sheep, tools and thatch
3	Akuure Akanluke	No	-	-
4	Sardor Thadeus	No	-	-
5	Ayondor Akangore	Yes	2	1 goat, 1 sheep, thatch, tools
6	Ntwo ametaqha	yes	4	4 sheep, 1 goat, fowl, tools, thatch
7	Abombangra Achaama	yes	7	thatch, goats, poles, luggage and tools
8	Boapawo Apetega	no	-	-
9	Konokgabono Abee	Yes	5	Thatch utensils, luggage
10	Kwabena Apatea	yes	6	maize, utensils
11	Adongo Achemba	yes	7	goats, sheep, fowls, utensils, luggage, thatch
12	Ataeta Achaa	No	-	-
13	Ababono Nyaaba	Yes	9	Harvested corn, tools thatch

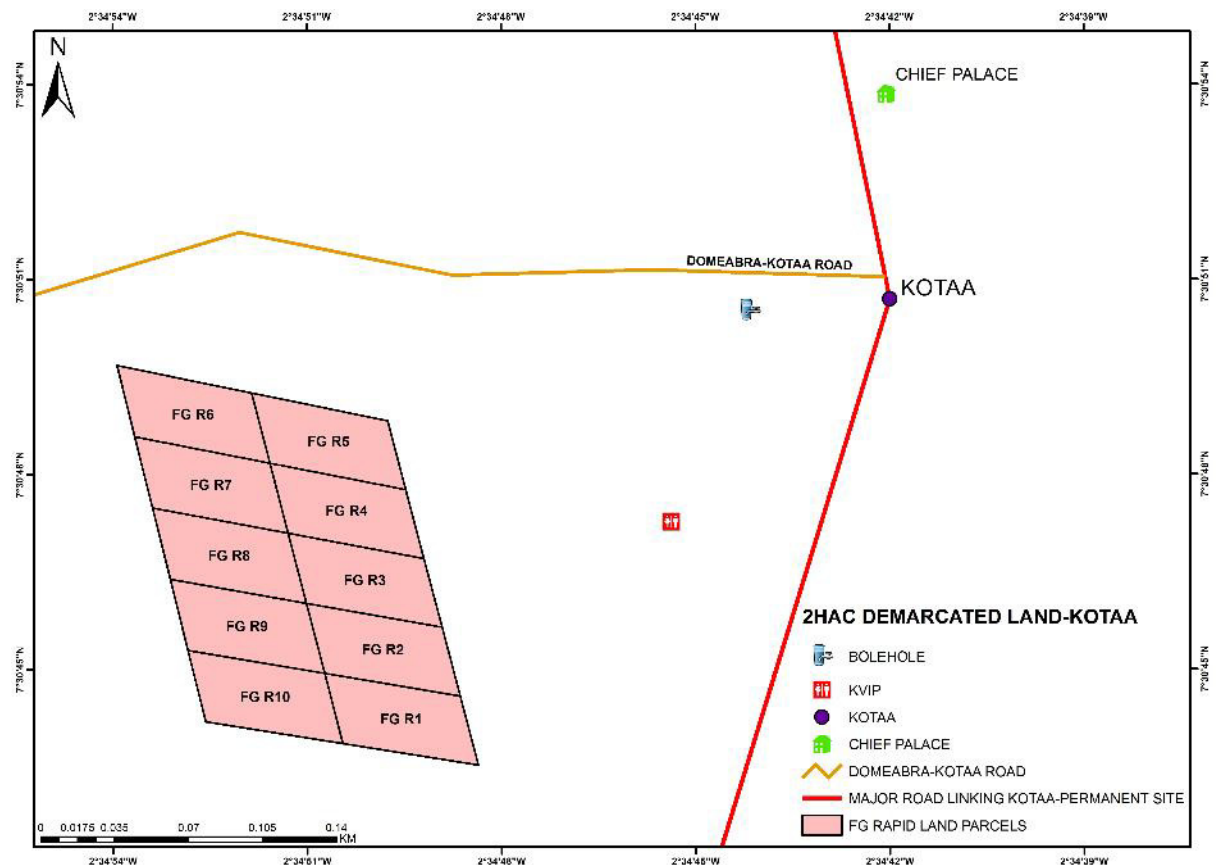
The people (4 families) that will not be moving have signed a letter stating that they voluntarily opt not to move to Kotaa. The letters are attached in Annex J. None of the PAP are living in the Form Ghana plantations currently.

9.4.6 Update constructions Kotaa

Construction of a borehole in Kotaa has been done and the production of the borehole has been tested. The borehole will allow both the settlers and the existing Kotaa community to have access to clean water.

Work has started on an 8-seater KVIP toilet block. This block will increase access to sanitation in Kotaa. This block is in addition to the block given to the community in October 2017. On the map below it is visible that both the bore hole and the ablution facilities are within short distance of the proposed settlement plots.

The land that was made available for the settlers was inventoried. The people that were farming on the land have been compensated. The land is now available and without claim. Contracts and proof of payment are in Annex H to this document. It has been subdivided in 2000 m2 plots. These plots are available for house construction by the settlers from Akumadan.



9.4.7 Update Intercropping in Tain

The intercropping possibility is part of what Form Ghana has to offer to people. This concerns local farmers as well as the settlers from Akumadan.

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According to Form Ghana policy, people farming the land need to be in the possession of an intercropping agreement issued by Form Ghana. New farmers can be awarded a two year intercropping agreement, whereas farmers known to the company can be awarded a 5-year intercropping agreement. When the research for the SEIMAP/ RAP was conducted there were 84 intercropping agreements in Tain.

Currently **420** two year intercropping agreements are in function and **80** five year intercropping agreements.

Community	5yrs	2yrs	Total
Domeabra	0	6	6
Ampenkrom	0	14	14
Arkokrom	0	115	115
Kotaa	0	19	19
Yawtwenekrom	7	35	42
Asantekrom	0	47	47
Kwadwoarko	0	38	38
Oforikrom	6	1	7
Tainso	23	18	41
Jejemireja	9	0	9
Abuokrom	0	19	19
Namasua	11	0	11
Meremano	24	88	112
Berekum	0	20	20
Total	80	420	500

The inter-croppers come from various communities. The land area farmed with intercropping is 559 hectares.

9.4.8 Update Fulani herders

A census of the size of the herds and current moving patterns of the Fulani herder is still to be done. This will be verified in the coming time.

10. CONCLUSIONS

From the reporting it appears that mainly the water monitoring system needs to be put in place. The other aspects of company E&S are in proper working order.