

## **DRAFT REPORT**

### *Working title:*

### **Analyses of incentive mechanisms for rewarding rural farming communities to adopt sustainable land use practices under a REDD+ implementation in forest and savanna transitional zones, Ghana**

#### **1.0 Introduction**

Climate-smart agriculture has the potential to sustainably increase productivity, reduce greenhouse gas (GHG), and enhance achievement of national food security and development goals (FAO, 2013). Because of these, it has become one important approach to achieving food security and climate change goals. To employ this method in order to realize these dual goals, incentives, subsidies or compensations to farmers are required. While incentives are signals that indicate increase in value following a given course of action, subsidies are instruments that can be used to correct market distortions (Mayers et al. 1996). On a larger scale, subsidies may not be sustainable while incentives could be sustainable, but would only be effective where the policy and regulatory framework are complementary (Mayers et al. 1996). In the agriculture and forestry sectors in Ghana, various fiscal and financial incentive schemes (formal and informal) are in place to encourage farmers to sustainably manage forest and agricultural landscapes (Lindhjem 2010). Notable among these incentive schemes in Ghana are the modified taungya system (MTS) (a system of rehabilitation of degraded forest reserves with food and tree crops to improve farmer livelihood and the environment); the ‘abunu’ and ‘abusa’ system (system of sharing of crops grown on agricultural land acquired on hired/rental basis); and timber revenue sharing system (sharing of revenue (stumpage fees) that is generated from the sale of commercial timber species in forest reserves and outside forest reserves).

With the sharing of revenue obtained from the stumpage fees, the Forestry Commission deducts a management fee of 60% in the on-reserves and 40% in the off reserves. An additional deduction of 10% is given to the Administrator of Stool Lands. The remaining is shared between the District Assembly (55%), the stool (25%) and Traditional Council (20%). One other timber revenue source is the Concession Rent (fee paid per hectare of forest for a concession area). Revenue from this source is also shared in the same way, but without the FC deductions (Lindhjem et al. 2010).

All these systems or schemes generate some benefits to individual migrant and tenant farmers. For instance, the MTS and the ‘abunu’ and ‘abusa’ make farmlands available to many non-titled land owners (leasehold and share crop farmland holders) for their agricultural purposes (Blay et al 2007). These benefits notwithstanding, the activities of these non-titled/insecure farmland holders contribute to deforestation both in the forest savanna transition and high forest zones of Ghana (Damnyag et al. 2012; Leach and Fairhead 2000). The non-conservation behavior exhibited by this category of farmers is attributed largely to the benefit sharing arrangements and the adverse conditions governing such arrangements. For instance, in Gyasi (1997) study on strategies on sustainable farming among these insecure farmland holders, he notes an overexploitation of the farmlands arising from the one half to one third (i.e. the ‘abunu’ and ‘abusa’) of the food crops cultivated by these tenant/migrant farmers that are given to the

landowners. This is not in isolation; Afikorah-Danquah (1997) study also observed overexploitation of farmlands by tenant farmers in the Wenchi district in the Brong Ahafo region of Ghana. Even farmers who acquire their farmlands through outright purchase in the cocoa growing areas are not much better than those who engage in short-term leasehold of farmlands. Because most of those group of farmers are continuously forced to contribute to festive and land litigation activities that their land owners engage in (Benneh 1988). According to Benneh (1988), such farmers consider these as exorbitant demands on them that make it difficult for them to engage in forest conservation activities.

These adverse effects on tenants and migrant land holders arising from the informal farmland benefit sharing arrangements are not in isolation. It appears land owners themselves are not satisfied with the formal/statutory arrangement of sharing of timber revenue generated from trees on their farmlands. This dissatisfaction is partly due to the concession Act, 1962 (124) which does not allow felling of naturally occurring trees outside and inside forest reserves for monetary gains (Hansen et al. 2009). Although the constitutional land owner beneficiaries (stool/chief) complain of marginally benefiting from trees on their farmlands, land users (leasehold and share crop farmland holders) get nothing under the prevailing timber revenue sharing in Ghana (Damnyag et al. 2012). To address this timber benefit sharing challenge under the Reducing Emissions from deforestation and forest degradation (REDD) policy (an international climate change mitigating effort);Ghana's Forest and Wild policy is being reformed to clarify land owners and farmer's rights (FC, 2012). Despite this reform, number problems still remain and need to be resolved. Notable among these is the distributional mechanism and weighting of the REDD plus payment at the farm level among land owners and land users (Damnyag et al. 2012; UNCCD, 2012). It is part of this knowledge gap in the potential REDD plus payment distribution at the farm level that this report tries to fill. It is a report on activity 2.3 of ITTO project RED-PD 093/12 Rev. 3 (F). The specific objectives are (i) analyze local communities perception of the potential REDD+ payment distribution using farmers in six communities in three proposed national REDD plus pilot project sites as a case study and (ii) Develop potential REDD + benefit-sharing proposals/guidelines at forest/farm level for local stakeholders/communities from the case study results.

## **2.0 Case study of distribution of potential REDD + benefits from agricultural lands in forests and savannah transition zones**

### *2.1 Background*

REDD+ is to create incentives for the reduction of emissions from deforestation and forest degradation, carbon stock enhancement, conservation and sustainable management of forests in developing countries (UNCCD, 2012; Mwayafu et al. 2011). Although most definitions of benefit in the REDD+ literature refer only to monetary benefits provided for emission reductions and carbon stock enhancement, according to Luttrell et al. (2012), implementation of REDD+ activities can give rise to a number of benefits in addition to the monetary benefits. While employment, livelihood improvement, fuel wood etc. are the direct benefits, the indirect ones are strengthening of tenure rights and law enforcement, enhanced participation in decision making, soil protection, water quality and climate stabilization (Luttrell et al. 2012). Aside these direct

and indirect benefits, it is worthy of note that there are also cost associated with the implementation of REDD+ activities. These costs include opportunity cost-forgone net benefits from non-conversion of forest to other land uses other than for the carbon emission reduction activities (Borner et al. 2010). The others are transaction costs (costs to perform transaction involving REDD+ payment which include costs to external parties e.g. market regulators and system administrators) and implementation costs-costs directly associated with actions that bring about reduced deforestation and reduced emissions (Pagiola and Bosquet, 2009). According to Vhugen et al. (2011), benefit sharing mechanism is made up of different institutional means, governance structures and instruments needed for sharing both finance and net benefits from REDD+ implementation

In the developing countries, how these benefits and costs should be shared between stakeholders, particularly at the forest and farmland level where emissions reduction activities take place is yet to be fully understood. This is particularly the case in Ghana with no experience with REDD+ pilot project's implementation unlike in other countries like Tanzania, Peru, Brazil and Cameroun (Verchot et al. 2012). For now, emphasis on addressing issues of REDD+ related benefit distribution has been at the international level and to some degree at national level, with very limited analysis at the lowest tier level of the administrative hierarchy, which is usually the village, community or farm level (Mohammed, 2011).

Knowledge on benefit sharing both at the national and local level is very essential in national REDD+ strategy design and implementation (FCPF, 2012). Such benefit sharing system is to aim to provide clear and direct incentives for action and build support and legitimacy for the REDD mechanism (Mohammed, 2011). The aim of this case study is to determine how potential REDD+ benefits could be distributed among beneficiaries at community or forest level to ensure effectiveness, efficiency and equity in the implementation of the proposed national REDD+ pilot projects in the study areas. The specific objectives are (i) determine the opportunities and challenges in design and implementation of future REDD+ benefits distribution at the community, forest and farm gates; (ii) develop models for potential REDD+ benefit distribution at community, forest and farm gates to secure legitimacy and support; and to serve as guidelines for the proposed national REDD+ pilot projects in Ghana.

## *2.2 Theoretical background*

Six themes with lessons of relevance to national implementation of REDD+ and benefit-sharing (BS) have been elaborated in Lindhjem et al. (2010) and Nkata et al. (2012). These themes are; Integrated conservation and development projects (ICDP); Payment for forest environmental services (PES), Clean Development Mechanism (CDM) and voluntary carbon markets; Community forestry management (CFM); Sustainable forest management (SFM).

Regarding sharing of revenue from forest management activities involving local communities, a number of policies and guidelines have been developed in different countries. These policies to a larger extent provide directions to the sharing of these benefits between the state and communities. According to Lindhjem et al. (2010), this is vertical benefit sharing. The horizontal BS is the situation where communities are left to develop their own internal benefit sharing mechanism. One important characteristic of the two is that the benefits provided for the vertical

BS compared to that of the horizontal BS differ from one country to the other (Lindhjem et al. 2010). In Ghana, the stumpage fees sharing between the state and the local communities illustrate the link connecting the vertical BS to the horizontal BS. Factors that need to be in place to make the horizontal benefit sharing to work well are i) clear rules and guidelines regarding benefit sharing between state and the local communities. These are intended to minimize corruption and rent seeking tendency and improve transparency among the actors. The others are ii) lower government taxes on these benefits and iii) inclusion of community's cost in forest management in their benefit computation. Other important factors required for the effective functioning of the horizontal benefit sharing in the communities are i) management plan, ii) executive group representing community members, etc (Lindhjem et al. 2010).

### 2.3 Methodology

#### 2.3.1 Study area, sampling and data collection

##### *Study area*

The study was conducted in 2 communities each in the Aowin-Suaman (New Yakasi and Adonikrom), Asikuma-Odobeng Brakwa (Bedum and Brakwa) Districts and Kintampo North Municipal (Dawadawa no.1 &2 and Tahiruu and Attakuraa) in the Western, Central and Brong Ahafo regions respectively (Table 1 & Figure 1). Kintampo North Municipal is the smallest among the tree study districts in population size (GSS, 2012), and the largest in land size.



Figure 1: Map of Ghana showing the study communities in yellow label (Google earth, 2013)

The main criterion for selecting the districts and the communities was because they belong to the communities of three of the proposed national REDD+ pilot projects in Ghana

Table 1: Socio economic data of the study districts

Characteristics	Aowin-Suaman	Kintampo North Municipal	Asikuma-Odobeng Brakwa
Population	138,415	95,480	112,706
Longitude	2° 30'W and 3° 05'W	1°20'W and 2°1'E	
Latitude	5° 25' N and 6° 14' N	8°45'N and 7°45'N	
Land Area	2,717 Km <sup>2</sup>	5,108 Km <sup>2</sup>	884.84 Km <sup>2</sup>
Mean annual rainfall		1,400mm-1,800mm	
Mean monthly Temperature	27°C	26.5°C - 27.2°C	26° -34°C.
Vegetation	Moist-Semi-Deciduous Forests and rainforests	Interior wooded/tree savannah.	Rainforest with patches of semi-deciduous forest

Source: Kintampo North Municipal Assembly 2006 (<http://kintamponorth.ghanadistricts.gov.gh>)

### *Sampling and data collection*

Each of the study communities was visually divided into four quadrants and the dwelling units systematically selected. The unit of the interview was the household heads in these dwelling units. The study communities were visited on days where they were at home to participate in the interview. The questionnaire designed and pretested in June 2013 was used to collect the data through an individual interview on a face-to-face basis. The local dialect was used in the interview and the answers recorded in English in spaces provided in questionnaire sheets. The information collected included socio economic characteristics of the respondents, their knowledge about the importance of trees on their farmlands, their opinion on stakeholders of potential REDD+ benefits, who the beneficiaries should be, reasons why a particular stakeholder deserve to benefit, preferred form of the benefits and how the potential REDD+ compensation can be used to address the problems of deforestation and forest degradation in the study communities.

## *2.4 Results and discussions*

### *2.4.1 Socio economic characteristics of respondents*

A total of 236 farmers were interviewed consisting 77, 80 and 79 household heads in the Aowin-Suaman, Asikuma Odobeng Brakwa and Kintampo North Municipal districts respectively (Table 2). In all these communities, males interviewed were more than the females and the average household size was higher in the Kintampo North Municipal district than the remaining districts. The main occupation for almost all these households was farming with a few engaging in trading (Table 2)

Table 2: Socio economic characteristics of respondents

Characteristics	Aowin-Suaman	Asikuma Odobeng Brakwa	Kintampo North Municipal
Communities (No. of people interviewed)	New Yakasi(42) Adonikrom(35)	Bedum(40) Brakwa (40)	Dawadawa No. 1 & 2(41) Tahirukura&Attakura (38)
Number interviewed	77	80	79
Gender of respondents (% of total respondents)	Male 49 (21.0%) Female 26 (11.2%)	Male 73 (31.3%) Female 7 (3.0%)	Male 62 (26.2%) Female 16 (6.9%)
Average number of persons in households	7	7	9
Mean Age (Years)	50	48	49
Level of education ((% of total respondents)	Formal (Primary, JHS, SHS, MSLC, Tertiary) 58 (24%) No Formal 19 (8.1%)	Formal 62 (26.3%) No Formal 18 (7.7%)	Formal 33 (14.1%) No Formal 45 (19.1%)
Main economic activity (% of total respondents)	Farming 74 (31.6%) Trading 2 (0.9%) Tailor 0 (0%) Teacher 1 (0.4%)	Farming 74 (31.6%) Trading 4 (1.7%) Tailor 1 (0.4%) Teacher 1 (0.4%)	Farming 76 (32.5%) Trading 1 (0.4%) Tailor 0 (0%) Teacher 0 (0%)

#### 2.4.2 Main crop cultivated and nature of land ownership

The main economic activity in the study communities is farming. In Aowin-Suaman and the Odobeng Brakwa districts, sun-grown cocoa farming is predominant, while in the Kintampo North Municipal district yam farming is the predominant crop (Table 3). In the Odobeng Brakwa districts compared to the Aowin-Sauaman districts, shaded-grown cocoa is more prevalent. In terms of REDD+ interventions of inclusion of trees on farmlands, it may be more readily promoted in this area. In the case of the Kintampo district, retention of trees on yam farms especially Shea trees may be more easily promoted compared to the rice farms. In most rice farms, most trees are removed by farmers in order to prevent and drive away pest including birds that use these trees as habitats to feed on the rice at the times of maturity.

Table 3: Main crop cultivated in the study communities across the study districts

Main farming (cocoa) type	Aowin-Suaman	Asikuma Odobeng Brakwa	Kintampo North	
	% total respondents (N=74)	% total respondents (N=77)	Main farming type	% total respondents (N=59)
Sun-grown-hybrid	80	60	Rice	41
Shaded-old type	10	25	Yam	46
Both sun-grown-hybrid and shaded-old type	11	16	Maize	7
			Beans	7

Crops grown on the farmlands in the three study districts are largely on own lands (Table 4). This has positive implications for REDD+ interventions in these areas in terms of a more likely acceptance of such activities in future and possible lower conflicts regarding benefit sharing. The next important land ownership that could support REDD+ intervention is rented land (Long

term). Farmers engaged in farming activities governed by these two land ownership types are more likely to engage in conservation activities aligned to REDD+ interventions compared to the short term and share cropping farmland holders (Damnyag et al. 2012). Although tree crop growers (Cashew and Mango) are fewer in the Kintampo North Municipal compared to the other two districts with high percentages of tree crop (cocoa), these types could be a useful starting point for introducing additional tree crops into such farms in line with REDD+ intervention. One difficulty with REDD+ intervention in the Kintampo North Municipal is the presence of the larger number of rented (short-term) and sharecropping farmlands holders compared to the other two districts. The larger presence of this group of farmers is likely to pose problems in the acceptance of REDD+ interventions and sharing of the benefit that may be generated from such activities

Table 4: Crops grown on farmlands in the study districts across different land ownership type in percentage of total of respondents

District	Crops cultivated	Nature of land ownership			
		Own land	Rented land(long term)	Rented land (short term)	Share cropping
% total respondents (N=45)					
Aowin-Suaman	Mixed	35.6	-	-	-
	Cocoa	71	-	-	-
	Cassava	22	-	-	-
	Maize	11	-	-	-
	Vegetables	2	-	-	-
	Sugar cane	2	-	-	-
	Yam	4	-	-	-
	% total respondents (N=35)				
Asikuma odbeng Brakwa	Mixed	20	6	3	-
	Cocoa	40	17	0	-
	Cassava	23	14	3	-
	Maize	17	3	0	-
	Vegetables	0	3	0	-
	Coconut	0	6	0	-
	% total respondents (N=71)				
Kintampo North	Cassava	8.5	2.8	0	0
	Maize	53.5	12.7	14	2.8
	Vegetables	1.4	0	0	0
	Yam	46.5	8.5	5.6	2.8
	Rice	48	13	14	1.4
	Groundnut	18.3	4.2	0	0
	Mango	1.4	0	1.4	1.4
	Beans	17	0	0	0
	Pepper	4.2	1.4	1.4	0
	Cashew	2.8	0	1.4	1.4
Okro	5.6	0	0	0	

#### 2.4.3 REDD+ funds beneficiaries and reason

The first four most important beneficiary of REDD + benefits in the Aowin-Suaman and Asikuma Odobeng Brakwa districts (cocoa growing areas);are the community as a whole, the landowner, her family members and the farmer (Table 5). The main reasons for which they are

entitled to benefit from such funds are development of the entire community, farmer's well-being and reward for lands owned that are used for the REDD+ interventions or activities. In the Kintampo North Municipal district, the farmer is the most important beneficiary of the REDD+ funds, followed by the traditional ruler, opinion leader and the community. Apart from the landownership including own, long, short and share cropping, which is the main reason for which beneficiaries should receive REDD+ funds, support of emission reduction activities is also one important reason why an opinion leader in this area should receive such funds (Table 5). In the three districts, the farmer who is on the ground where emission reduction activities take place appears to be most important beneficiary of REDD+ funds. This may be justified on the grounds that he/she is directly engaged in REDD+ activities and owns the land on which such activities take place whether for a long or short term

Table 5: REDD + funds beneficiaries and reason

REDD+ Beneficiary	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	%total respondents(N) =75	Reason	%total respondents (N) =72	Reason	% total respondents (N) =76	Reason
Landowner	53.3	Owns the land	86.5	Owns the land	9.7	Owns the land
Landowner's family	45.3	Owns the land	-	-	14.5	Basic needs
Community	56.0	Development	1.4	Development	22.4	Support emission reduction activity
Traditional ruler	42.7	Owns the land	25.7	Owns the land	76.3	Owns the land
Opinion Leader	25.3	Take care of community	6.8	Owns the land	40.8	Owns the land
Government	1.3	Development	-	-	5.3	Initiates the project
Hired labour	2.7	Hard work	-	-	-	-
Needy/poor	2.7	Own the land	-	-	-	-
Government representative (Unit Committee)	6.7	Help in decision making	-	-	14.5	Support emission reduction activity
Country	17.3	Development	-	-	-	-
World	9.3	Development	-	-	-	-
Farmer	45.3	Development	87.8	Own the land	82.2	Own the land
Forest guard	-	-	1.4	Tree maintenance reward	-	-

#### 2.4.4 REDD+ benefit computation and payment basis

##### *Basis of REDD+ benefit computation*

The important basis on which REDD+ benefit should be computed in the study communities are payment by performance (per acre of forest conserved for carbon emission reduction activities) and the actual amount of CO<sub>2</sub> that the individual farmer is able to reduce (Table 6). The later

appears to be the key factor in the benefit computation in the Kintampo North Municipal and Odobeng Brakwa districts, while a mixed approach of the computation is the most important factor in the Aownin-Suaman district (Table 6)

Table 6: Basis of computation of REDD benefits in the study communities in the three different districts

Basis of computation of REDD benefits	Aowin-suaman		Asikuma Odobeng Brakwa		Kintampo north municipal	
	Frequency	%	Frequency	%	Frequency	%
Per acre of forest conserved (pay per performance)	17	22.08	27	35.06	21	26.58
Per ton of CO <sub>2</sub> reduced	10	12.99	38	48.10	29	36.71
In relation to conservation activities such as tree planting and carbon monitoring	13	16.88	3	3.79	12	15.19
Mixed approach	37	48.05	11	13.92	17	21.52

#### *Basis of payment/distribution to farmers*

Amount of CO<sub>2</sub> emission reduced in REDD+ activities should be the first basis of the benefit distribution (Table 7). This basis is followed by equity, a payment scenario where the amount one receives is equivalent to his contribution to CO<sub>2</sub> emission reduction activities. Labour inputs and size of land holding for CO<sub>2</sub> emission reduction activities is the third most important basis to consider in the REDD+ benefit distribution. Equal payment where all households receive the same amount irrespective of the contribution to the CO<sub>2</sub> emission reduction is least rank. In all these communities in the three study districts, there is significant difference in the ranking of these basis, except the payment of REDD+ funds on the basis of the needy (which favour the poor and needy in the distribution of REDD+ funds) in the communities

Table 7: Ranking of the basis of REDD+ benefit distribution on 1 to 5 scale of importance by respondents in the study communities of Aowin-Suaman (AN), Asikuma-Odobeng-Brakwa (AB) and Kintampo North Municipal (KN) districts, Ghana

Priority of REDD Benefit distribution	Number of respondents	Minimum	Maximum	Mean	H test statistics (mean rank, p-values) in AN, AB, KN in WR, CR, BR
Reduced CO <sub>2</sub> emission	234	1	5	1.68	AN, AB,KN 131, 109, 113, H(2) 5.9P=0.053
Equity(payments match contributions)	230	1	5	2.2	AN, AB,KN 142, 102, 104 H(2) 19.6 P<0.001
Labor and size of land holding	233	1	5	2.37	AN, AB,KN 87, 131, 132 H(2) 25 P< 0.001
Need/poverty ( the outcomes satisfy needy)	199	1	5	4.21	AN, AB,KN 103, 102, 95 H(2) 1.01 P=0.603
Equal payments to all households or everybody received the same amount	202	1	5	4.39	AN, AB,KN 91, 110, 95 H(2) 5.03 P=0.081

#### 2.4.5 Choice of REDD benefit transfer and reasons for the preferred choice

In all the study communities in the three districts, the preferred choice of REDD+ benefit transfer is largely to the household and least to the community as a whole (Table 8).

Table 8: Choice of REDD benefit transfer

Benefit transfer choice	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	Frequency	%	Frequency	%	Frequency	%
Households	73	96.1	77	97.5	74	94.9
Community	1	1.3	1	1.3	2	2.6
Both community and household	2	2.6	1	1.3	2	2.6

The important reasons for preferring REDD+ benefits transfer to the households instead of the community as a whole are because the household work on the farmland where the CO<sub>2</sub> emission reduction is done; to avoid misappropriation of such funds; to motivate farmers to nurture trees on farmlands and enable them enjoy the fruits of their labour (Table 9). Misappropriation of such public funds is not only common in the public sector, it is also common in the rural areas where literacy rate is particularly low (ref)

Table 9: Reason for preferred choices

Reasons for preferred choice	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	Frequency	%	Frequency	%	Frequency	%
Household work on the farmland	20	33.3	4	6.9	29	39.7
To avoid misappropriation of funds	14	23.3	10	17.2	20	27.4
To avoid conflict	5	6.5	4	6.9	3	4.1
Improve standard of living	6	7.8	-	-	-	-
To motive farmers to nurture trees	5	6.5	14	24.1	6	8.2
To enjoy fruits of our labour	8	10.4	19	32.8	14	19.2
Own the land	2	2.6	-	-	-	-
Need money	-	-	1	1.7	-	-
To ensure equity	-	-	6	10.3	-	-

The form in which respondents in all the districts preferred REDD+ funds to be allocated to community as a whole is largely for predetermined community development projects, although a good number of respondents in the Kintampo North District prefers that such community funds be given to them to decide on their uses (Table 10).

Table 10: Uses of REDD+ benefit for community as a whole

Uses of REDD benefit for community as a whole	Aowin-suaman		Asikuma Odobeng Brakwa		Kintampo north municipal	
	Frequency	%	Frequency	%	Frequency	%
Pre-determined community development project	16	94.12	23	100	3	60
Give to community and they decide what to do	1	5.88	0		2	40

Preferences of the development projects on which REDD+ benefits allocated to community as a whole should be spent vary significantly among respondents in the study districts (Table 11). While the most development project required in the Aowin-Suaman district is hospital, it is streetlight in the Asikuma Odobeng Brakwa and School in the Kintampo North Municipal

Table 11: Preferred development projects to use REDD+ funds for community as a whole

Preferred development projects to use REDD+ funds for community as a whole	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	Frequency	%	Frequency	%	Frequency	%
Hospital	8	29.63	0	0	2	28.57
School	9	33.33	0	0	3	42.86
Streetlight	2	7.41	1	100	0	0
Teacher's apartment	1	3.70	0	0	0	0
Roads	1	3.70	0	0	1	14.29
Pipe	2	7.41	0	0	0	0
KVIP (Toilet facility)	4	14.81	0	0	1	14.29

#### 2.4.6 Preferred form of REDD benefit-cash or in-kind

In all the study districts, cash is the most preferred form for the household's REDD+ funds allocation (Table 12). The most important preferred form is both cash and in-kind, that is dominant in Asikuma Odobeng Brakwa district, compared to the remaining two districts

Table 12: Preferred form of REDD+ benefit allocation to households

Preferred form of REDD+ benefit allocation to households	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	Frequency	%	Frequency	%	Frequency	%
Cash	62	81.58	38	49.35	48	64.86
In-Kind (tangible and intangible)	3	3.95	8	3.89	14	18.92
Both cash and in-kind	11	14.47	31	40.26	12	16.22

Although the in-kind form is the least among the three forms that household prefers that REDD+ funds is allocated to them, different forms of these in-kinds preferences vary widely among respondents (Table 13). While car/motorbike and farm inputs are the most preferred form of these in-kind payment in the Aowin-Suaman district, farm inputs are the most important in the Odobeng Brakwa and Kintampo North Municipal districts (Table 13)

Table 13: Types of in-kind preferences by the household respondents

In-kind preferences	Aowin-Suaman		Asikuma Odobeng Brakwa		Kintampo North Municipal	
	Frequency	%	Frequency	%	Frequency	%
House	11	20.37	2	11.11	5	15.15
Car/motorbike	13	24.07	0	0	7	21.21
Scholarship	1	1.85	1	5.56	2	6.06
Corn milling machine	5	9.26	0	0	0	0
Building materials	8	14.81	0	0	9	27.27
Saw mill machine	1	1.85	0	0	0	0
Farm inputs	13	24.07	15	83.33	10	30.30
TV	2	3.70	0	0	0	0

#### 2.4.7 Using REDD+ benefits to minimize deforestation and forest degradation

Activities that community members carry out that enhance forest conservation in the study districts vary widely. However, the important ones in the Aowin-Suaman district are forest plantation establishment on farmlands and agroforestry, nurturing of trees on farmlands in the Odobeng Brakwa and Afforestation in the Kintampo North Municipal districts. These are useful information for REDD+ intervention in these districts possibly for REDD+ project developers. Additional baseline information on the categories of REDD+ intervention that could be implemented in these areas can also be inferred from this. For instance, avoiding bush burning and cutting of trees could work for avoided deforestation programme in addition to the afforestation projects in the Kintampo North district. One another important implication of this result is that the basis of distribution of REDD+ compensation could also target farmers who engage in these conservation activities in the study communities.

Table 14: Activity that enhance forest conservation in the study communities in the three districts

Activity that enhance forest conservation	Aowin-Suama	Asikuma Odobeng Brakwa	Kintampo North Municipal
	% of respondents (N=69)	% of respondents (N=72)	% of respondents (N=68)
Security/protection of chainsaw activities	13	6.9	19.1
Avoid bush burning	13	-	30.9
Afforestation	10.1	2.8	48.5
Plantation	30.4	8.3	2.9
No clearing of weeds/forest/mulching	4.3	4.2	1.5
Avoid cutting trees	14.5	9.7	16.2
Avoid harvesting of NTFPs	1.4	-	-
Agroforestry	29.0	8.3	2.9
Avoid bad hunting practices	4.3	-	-
Organic farming	15.9	6.9	-
Nurturing of trees on farmland	27.5	68.1	19.1
Law enforcement	4.3	19.4	-
Allowing the field to fallow	-	-	4.4
Creating sacred grove	-	12.5	-

On activities that cause deforestation and forest degradation (DFD) in the landscapes in the study area (Table 15), bush fire and charcoal production are the predominant problems in the Kintampo North Districts, while illegal chainsaw operation is the most serious concern in the Asikuma Odobeng Brakwa and the Aowin-Suaman districts. Aside these different causes of DFD in the study area, farming activities are one cause of DFD that is prevalent in all the communities in the study districts. Although these causes are potential constraint to any REDD+ intervention, and for such a project developer, they are important baseline information for the REDD+ benefit distribution. It implies that stakeholders that engage in these activities that destroy the environment should not be provided with any compensation from the REDD+ funds

Table: 15: Activities that cause deforestation and forest degradation in the study communities in the three districts

Activity that destroy forest	Aowin-Suaman	Asikuma Odobeng Brakwa	Kintampo North Municipal
	% of respondents (N=75)	% of respondents (N=79)	% of respondents (N=79)
Bush fires	37.3	6.3	45.6
Application of herbicides	2.7	5.1	1.3
Chainsaw activities	70.7	84.8	34.3
Wind	1.3	1.3	-
Sand winning	-	1.3	-
Clearing of forest for building purposes	-	1.3	-
Farming	24.0	55.7	36.7
Disposal of waste on land	2.7	-	-
Bad hunting practices	8.0	-	1.3
Charcoal production	1.3	-	58.2
Illegal mining	14.7	-	-
Fertilizer application	1.3	-	-
Shifting cultivation	1.3	-	-
Use of machines on farmlands	-	-	1.3

### 3.0 Opportunities and Challenges of REDD+ benefit distribution at the forest and farm level

The opportunities available in the study communities that favour REDD+ interventions and subsequently the smooth benefit distribution are: i) Growth of crops largely on own lands; ii) Prevalence of shaded cocoa farm in one study area compared to non-shaded cocoa farms; iii) dominance of yam growing compared to rice; iv) Top four most important beneficiary of REDD+ benefits are the whole community, the farmer and his family members in cocoa growing areas and the farmer in the Shea nut growing areas; v) Basis of REDD+ computation and payment should be per ton of CO<sub>2</sub> reduced; v) presence of conservation enhancing activities -forest plantation establishment on farmlands and agroforestry, nurturing of trees on farmlands and afforestation in Aowin, Odobeng and Kintampo districts respectively

Despite these opportunities, there are also challenges that need to be addressed. These include i) difficulty in undertaking REDD+ intervention on sun-grown cocoa and rice growing farmlands in the forest and forest savanna transition zones study sites respectively, ii) The wide range of

REDD+ beneficiaries listed; iii) Prevalence of illegal mining and chainsaw operations in the two cocoa growing areas and charcoal production in the non-cocoa growing study area. Most of these problems have also been identified as challenges to the REDD+ implementation in Ghana (MLNR-FIP, 2012). As indicated in the present study, the shift from shaded to open cocoa farming, is one key challenge to REDD + implementation and the payment distribution. In addition to this is the issue of insufficient incentives to conserve or plant trees on farmlands outside forest reserves. The wide range of beneficiaries identified attest to this. The implication for this wide range is whether payment to be allocated to individuals in this range would be sufficient to encourage adoption of conservation agricultural practices (MLNR-FIP, 2012). Alongside this challenge, is when benefits obtain from illegal logging, mining and charcoal productions outweigh the benefits accruing to farmers from participation in REDD+ activities. Should this happens community members are unlikely to participate in the REDD + activities (Lindhjem et al. 2010)

### 3.1 Proposal/guidelines for potential REDD+ benefits distribution in rural farming communities

The analysis in this report provides a number of guidelines to shape decision making related to aspects of successful REDD+ implementation and benefit sharing mechanism at the forest and farm level. These include i) who should be the actors/beneficiary; ii) what are the existing processes for allocating REDD+ benefits; iii) how and in what form are they to be delivered.

The identification of the beneficiaries as done in this report should be of interest to benefit sharing schemes. The importance for this is to secure inclusiveness of all social groups in the communities that have a stake in both REDD+ benefits and co-benefits. The wide range of beneficiaries identified also implies that there may be the need to continuously put in measures to mitigate potential effects on the losers (for example in the decisions taken), rather than ignoring them altogether.

Regarding processes for allocating REDD+ benefits, household is the most preferred choice. This implies REDD+ interventions in the communities need to center more on the households. Maximum results could be achieved with the implementation of such activities if they are done on household basis instead of communal. In this way, benefits would accrue to the participating households. This finding conforms to the origin of Payment of Environmental Services (PES) as agreements contracted between several single landholders (FAO, 2011). There is however the potential to shift these contractual agreements from the individual to the community due to the disadvantages associated with the individual PES schemes and the corresponding advantages associated with the collective PES schemes (FAO, 2011)

Weighting of these benefits need to also be done based on the performance of the households who undertake the activities of the REDD + intervention, since this is the most important basis on computation of REDD+ benefit shown in the results of the present study (Mwayafu et al. 2011).

Cash payment is the most preferred form of REDD+ benefit distribution in the study communities. This may have to be taken into account in future in the distribution of REDD+ benefits in the study area

## 4.0 Conclusion

The report shed lights on REDD + intervention and the corresponding benefits distribution at the community and household level in forest and farm level. The main findings are that there is wide range of beneficiaries of REDD+ payment at the community, forest and household level; REDD+ intervention and benefit distribution need to focus more on the household, not overlooking the community since there is potential to shift from the individual to the community as a whole; computation of payment should be based on performance of households in carrying out REDD+ activities; and cash payment is the most preferred options compared to the in-kind payment.

The implications of these findings to REDD + policy makers and potential project developers are as follows

- ❖ Although decision to transfer REDD+ benefit at the horizontal/forest and farm level need to be based on these findings; economic feasibility, local institutional capacity and governance structures, and the effects on the local economy and on the livelihoods of the poor households should be carefully weighed and assessed
- ❖ Community preferences would not be static. They are subject to changes, particularly when activities of the REDD+ interventions begin to roll out. Therefore, these preferences should be periodically assessed and changes in payment type should be made accordingly (Mohammed, 2011).

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