Review of Existing Land Tenure Arrangements in Cocoa Growing Areas
And their Implications for the Cocoa Sector in Ghana

SUBMITTED BY

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Special gratitude goes to all the key informants including the chiefs and other traditional authorities, CHED Officers, researchers at CRIG and all the cocoa farmers interviewed. To you all we say your efforts, time, and contributions to this study will never be forgotten.
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</tr>
</thead>
<tbody>
<tr>
<td>CAA</td>
<td>Cocoa Abrabopa Association</td>
</tr>
<tr>
<td>CODAPEC</td>
<td>Cocoa Disease and Pest Control Program</td>
</tr>
<tr>
<td>CHED</td>
<td>Cocoa Health and Extension Division</td>
</tr>
<tr>
<td>DO</td>
<td>Direct Observation</td>
</tr>
<tr>
<td>ESP</td>
<td>Environmental Sustainability and Policy for Cocoa Production in Ghana Project</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organisation</td>
</tr>
<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>KII</td>
<td>Key Informant in-depth Interview</td>
</tr>
<tr>
<td>LC</td>
<td>Lands Commission</td>
</tr>
<tr>
<td>LBCs</td>
<td>Licensed Buying Companies</td>
</tr>
<tr>
<td>SI</td>
<td>Survey Instrument</td>
</tr>
<tr>
<td>SAPS</td>
<td>Sustainable Agricultural Practices</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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</tbody>
</table>
EXECUTIVE SUMMARY

There is limited land for cocoa expansion in most of the cocoa growing belt in Ghana resulting in the rapid conversion of the few remaining forested areas into agriculture with negative environmental and biodiversity consequences. However, the promotion of environmentally sustainable production practices in cocoa landscapes cannot be treated in isolation but should be linked with reforming the current land and tree tenure systems prevailing in most of the cocoa belt. To reach this goal, the Environmental Sustainability and Policy for Cocoa Production in Ghana Project (ESP) contracted the Research Team to conduct a detailed analysis of the current land tenure arrangements in cocoa growing areas and how these are influencing natural resource management. Using both primary and secondary data collection approach, a total of 231 Cocoa farmers were interviewed through a structured survey in the Fanteakwa, Amansie West, Asunafo North and Wassa East districts in the Eastern, Ashanti, Brong Ahafo and Western regions of Ghana respectively. In addition, 12 key informant interviews and 6 focused group discussions were held. Composition of focused group discussions ranged between 14 and 26 cocoa farmers.

Study specific objectives were to:

- document and analyze existing tenurial arrangements in cocoa landscapes, in order to determine the linkage between existing tenure arrangements and adoption of long-term sustainable farming practices;
- identify and classify existing tenurial systems as pertains in the principal cocoa growing areas, and map out variation across regions/districts and traditional jurisdictions;
- identify perception of farmers, traditional authorities and other land owners on how the current tenurial arrangements incentivize sustainable production practices; and
- determine environmental risk factors and impacts associated with the current tenurial system.

Findings

About 61.3% and 38.2% of the cocoa farmers interviewed were natives and migrants respectively. Fanteakwa and Wassa East had more migrants than Amansie West and Asunafo North districts. Family and individual lands were acquired for cocoa farming in the districts surveyed accounting for approximately 56% and 37% of the sample interviewed respectively. Individual holdings and stool lands accounted for 9.5% and less than 1% of the sample interviewed respectively. The Wassa East district in the Western region relatively had more family and individual lands as compared to the Fanteakwa, Amansie and Asunafo districts in the Eastern, Ashanti and Brong Ahafo regions respectively. The Amansie and Asunafo districts had more stool lands with the chiefs having dispositional rights over cocoa farmlands.

Land can be accessed through various land tenurial arrangements including share cropping (Abusa, Abunu and Abuna), rental/lease, outright purchase, gifts, inheritance and common property. The most commonly practiced land access mechanisms for cocoa farming in the surveyed districts are sharecropping and inheritance. About 52% of the farmers interviewed...
practiced sharecropping solely or in combination with other land tenurial mechanisms consisting of *Abunu* (36%), *Abusa* (15%) and *Abuna* (1%). Sharecroppers in Amansie West district consist of *Abunu* (23%), *Abusa* (2%) and *Abuna* (2%). In Fantekwa district, cocoa farmers practicing sharecropping consist of *Abunu* (49%), *Abusa* (12%) and *Abuna* (4%). Similarly, 38% and 18% of the sharecroppers in Asunafo North district practiced *Abunu* and *Abusa* respectively. The Wassa East district recorded 39% and 27% of Abunu and Abusa sharecroppers respectively.

*Abunu* sharecropping (Arrangement between landowner and the tenant farmer whereby proceeds are split equally between the parties) is usually practiced when cocoa cultivation is done by the tenant farmer while in the case of *Abusa* (Arrangement between landowner and the tenant farmer whereby one side gets one-third and the other party gets two-thirds of the proceeds) cocoa cultivation is done by the landowner and the tenant becomes caretaker responsible for weeding, spraying, pruning, fertilizer application and harvesting. Welfare arrangements in addition to sharing of cocoa proceeds include provision of housing and food crops grown as intercrop in cocoa farms in some instances. It was observed that most landlords would prefer housing tenant farmers on the farm for effective performance.

About a third of the total sample confirmed that permanent land ownership allows for the adoption of environmentally sustainable practices including tree planting than the non-permanent ones who have no ownership rights to the land. Land rights are somewhat stronger in migrant villages as rewards for efforts made to turn forest into farmlands are rewarded with relatively longer term rights over land use. An extensive literature review, as part of this study, revealed that those with registered land or security of tenure are more likely to undertake conservation measures on their land and adopt other sustainable practices such as tree planting and other biodiversity conservation measure resulting in long term ecosystem health and services. This assertion was also confirmed by survey findings. About 61.7% of the sampled cocoa farmers agreed that land tenurial arrangements influence farmer’s decision to adopt environmental sustainable practices including the maintenance of tree and carbon stocks on farms, erosion control, save use of agrochemicals, protection of waterways, soil fertility management including the use of organic fertilizers and the protection of wildlife among others. On the other hand, such land investment decisions are often taken in consultation with landowners in cases where farmers do not have direct ownership rights to the land they are working on. The existing land tenurial arrangement for cocoa farming does not discriminate against social groups including youth, women, natives and migrants. Few women owned their own farm lands through inheritance. In the majority of cases, women support their husbands in the cultivation of cocoa.

About 24.8% of the sampled farmers said that adoption of tree planting and other long term sustainable practices depends on the landowner as well as the expected benefits that would accrue as a result of adopting the particular practice. Tenant farmers are more inclined towards practices that would bring them short term gains as most of them often have fixed term contracts with their landowners.
Overall, 38.5% and 41.2% of the sampled farmers reported that access to land were “not easy” and “not easy at all” respectively. Cocoa farmers explained that current available lands are forest reserves, land set aside for food crop production or lands located in valley bottoms not suitable for cocoa production. Changes in land tenurial arrangements over the years have been observed by 74% of the cocoa farmers interviewed. Observations include commoditization of land as opposed to a social product, competing demands for land for various purposes and for cultivation of crops other than cocoa and documentation of tenancy agreements.

From the multivariate regression analysis conducted in this study, the various factors identified as could be influencing the decision of farmers to adopt or not to adopt a sustainability practices were the scale of operation (farm size), the age of the cocoa trees, the age of the cocoa farmer, social capital (a measure of one belonging to one social group or more), residential status, the gender of the farmer, the educational level of the farmer and most importantly the tenure system a farmer is practicing.

Some of the suggestions for improvement in accessing land for cocoa farming include development of Land Policy for cocoa farming that would ensure proper documentation and formalization of tenurial systems with clear benefit sharing agreements, release of some forest reserves for cocoa cultivation, education on land registration and proper acquisition of land as well as resolution of land disputes.
1.0 INTRODUCTION

1.1. Background
Cocoa (*Theobroma cacao*) is Ghana’s most important export crop contributing to 8.2% of the country’s GDP and 30% of total export earnings in 2010 (FAO 2014). About 90% of cocoa is cultivated by smallholders and all cocoa beans are sold to Licensed Buying Companies (LBCs) which in turn sell to only one exporter in Ghana, the COCOBOD through its Cocoa Marketing Company (CMC), a subsidiary set up for the purpose, or to domestic processing companies. Total production increased from 450,000 tonnes in 2000 to 900,000 tonnes in 2010. The gradual increase is mainly due to high accessibility to improve and high yielding seeds and technical assistance, as well as a farm input subsidy programme initiated by COCOBOD.

The cocoa industry has enjoyed substantial technical support under various projects including the Ghana Cocoa Rehabilitation Project, under which farmers are compensated for replanting trees infected with the cocoa swollen shoot virus disease (CSSVD) - which encouraged a substantial rehabilitation, with large number of farmers replanting with higher yielding cocoa varieties – mainly hybrids - developed by the Cocoa Research Institute of Ghana (CRIG). Other initiatives that contributed to recent overall production increases led by COCOBOD include: the mass spraying programs, the free fertilizer distribution program, among others.

Figure 1.1 Trends in Cocoa Production and Yield in Ghana

It is generally perceived that tenure insecurity undermines the effectiveness of best environmental practices in the cocoa industry in Ghana. The land tenure system has defied many attempts by several governments to improve the administration of land in the country. When tenure rights are certain, whether customary or statutory, the land tenure system can provide incentives to use the land in a sustainable manner or invest in resource conservation.
whether for individual or community purposes. The promotion of best environmental practices and their adoption in the cocoa growing areas of Ghana would require the correction of land and tree tenure systems, removing constraints on the attainment of environmentally sustainable cocoa production in the country. To reach this goal, ESP contracted the Research Team to conduct a detailed analysis of the current land tenure arrangements in cocoa growing areas and how it is influencing natural resource management in these areas.

1.2 Objectives

Study specific objectives are to:

- document and analyze existing tenurial arrangements in cocoa landscapes, in order to determine the linkage between existing tenure arrangements and adoption of long-term sustainable farming practices;
- identify and classify existing tenurial systems as pertains in the principal cocoa growing areas, and map out variation across regions/districts and traditional jurisdictions;
- identify perception of farmers, traditional authorities and other land owners on how the current tenurial arrangements incentivize sustainable production practices; and
- determine environmental risk factors and impacts associated with the current tenurial system.

1.3 Methodology

1.3.1 Data Collection Instrument

This work builds on extensive literature review (studies already undertaken) with a view to avoid duplication and add value to an already existing knowledge base. Both primary and secondary data collection methods were employed. Primary data were collected using the following multiple tools:

- A survey Instrument (SI)
- Key Informant in-depth Interview (KII)
- Focus Group Discussion (FGD)
- Direct Observation (DO)

The structured questionnaire interviews, focus group discussion and the key informant interviews were employed to collect primary data while desk research and other official documents were reviewed to gather secondary data. See Questionnaire for one-on-one interviews and Interview guide for focus group discussions and key informant interviews attached in the appendices. Direct observation involves watching behaviors, practices and interactions in their natural settings. The mixed data collection instruments used helped to interpret and better understand the complex reality of land tenurial arrangement and social relations in the various districts and communities surveyed.
1.3.2 Sampling
With the help of the ESP project management team, four (4) regions were selected for this study including Eastern, Brong Ahafo, Ashanti and Western Regions of Ghana. Districts selected were as follows:
- Eastern Region – Fanteakwa District
- Brong Ahafo Region – Asunafo North
- Ashanti Region – Amansie District
- Western Region – Wassa East

Cocoa farmers for interviews were stratified according to the main land tenurial arrangements including the following:
- *Abusa* share cropping;
- *Abunu* share cropping;
- Farmers using inherited land; and
- Farmers using outright purchase land.

In addition to members of the Cocoa Life Program cooperatives, other farmers who were not members of the cooperatives were also interviewed as a control group.

1.3.3 Data Collection and Analysis
Actual field work and data collection commenced in September, 2014. A total of 231 Cocoa farmers were interviewed using the structured questionnaire. In addition, 12 key informant interviews and 6 focused group discussions were also held. Composition of focused group
discussions ranged between 14 and 26 cocoa farmers. Table 1 depicts the socio-economic profile of the respondents.

Table 1.1 Percent Distribution of Socio-economic profile of Respondents (N=231)

<table>
<thead>
<tr>
<th>Socio-Economic Variable</th>
<th>Fanteakwa</th>
<th>Amansie West</th>
<th>Asunafo North</th>
<th>Wassa East</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>76.5</td>
<td>69.6</td>
<td>71.1</td>
<td>64.1</td>
<td>69.6</td>
</tr>
<tr>
<td>Female</td>
<td>23.5</td>
<td>30.4</td>
<td>28.9</td>
<td>35.9</td>
<td>30.4</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(18 – 35) yrs</td>
<td>13.7</td>
<td>3.6</td>
<td>8.9</td>
<td>15.2</td>
<td>10.8</td>
</tr>
<tr>
<td>(36 – 60) yrs</td>
<td>60.8</td>
<td>60.7</td>
<td>64.4</td>
<td>62.0</td>
<td>61.9</td>
</tr>
<tr>
<td>Above 60 yrs</td>
<td>23.5</td>
<td>35.7</td>
<td>26.7</td>
<td>20.3</td>
<td>26.0</td>
</tr>
<tr>
<td>No Response</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
<td>2.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Residential Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td>15.6</td>
<td>94.6</td>
<td>93.3</td>
<td>42.2</td>
<td>61.3</td>
</tr>
<tr>
<td>Settler</td>
<td>82.2</td>
<td>5.4</td>
<td>6.4</td>
<td>57.6</td>
<td>38.2</td>
</tr>
<tr>
<td>Other</td>
<td>2.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Highest level of Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic (Primary/JHS)</td>
<td>66.7</td>
<td>73.2</td>
<td>60.0</td>
<td>34.2</td>
<td>55.8</td>
</tr>
<tr>
<td>Secondary (SHS, Tech/Voc)</td>
<td>9.8</td>
<td>1.8</td>
<td>11.1</td>
<td>20.3</td>
<td>11.7</td>
</tr>
<tr>
<td>Tertiary</td>
<td>3.9</td>
<td>7.1</td>
<td>4.4</td>
<td>0</td>
<td>3.5</td>
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<tr>
<td>None</td>
<td>19.6</td>
<td>17.9</td>
<td>24.4</td>
<td>45.6</td>
<td>29.0</td>
</tr>
<tr>
<td>Membership of Association</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15.7</td>
<td>0</td>
<td>0</td>
<td>12.7</td>
<td>7.8</td>
</tr>
<tr>
<td>Yes</td>
<td>84.3</td>
<td>100</td>
<td>100</td>
<td>87.3</td>
<td>92.2</td>
</tr>
</tbody>
</table>

Quality control

Quality assurance started on the field where supervisors/research team leaders reviewed questionnaires from enumerators. There were on the spot checks to ensure high quality data collection. The triangulation process involving the use of mixed data collection instruments also ensured cross-checking of data and information. There was data cleaning and editing before and after data entry to ensure high data quality.
Analysis of Data

The data collected were cleaned, coded, processed and analyzed using computer software applications including MS Word, MS Excel and the Statistical Package for the Social Sciences (SPSS) version 18. Frequency tabulation was produced for each variable as a way of checking completeness and inconsistencies. Tables, charts and graphs were generated from the data and cross tabulation done to establish relationships among key variables according to the study objectives.

Table 1.2 Framework for Data Collection

<table>
<thead>
<tr>
<th>Specific Activity</th>
<th>Methodology</th>
<th>Specific Methods</th>
<th>Source of information/Target groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>A review of current land tenure arrangements in cocoa growing areas and its practical implications for the cocoa sector</td>
<td>Extensive literature review on the key tenurial arrangements in Ghana as well as natural resource ownership, use, and management in cocoa farms. Identify how the current regime is affecting farmer’s production practices and their consideration of long-term sustainability (such as tree planning practice). Detail the range of relevant benefit sharing arrangements that exist in cocoa communities with adequate background information on the land tenure arrangements.</td>
<td>Desk review/Review of existing Project documents</td>
<td>Internet Existing project documents CocoBoard/CRIG</td>
</tr>
<tr>
<td>Determine the influence of land tenure regimes on environmental sustainability</td>
<td>Conduct detailed analysis on the influence of farmland ownership (including four categories below) on environmentally sustainable farming: Family land Individual land (also inherited and personally owned) Sharecropping Caretaker farmers Stool lands</td>
<td>Survey Key informants interviews Focus Groups Discussion</td>
<td>Agriculture Extension Agents (AEDs), Farmers (both migrant and native), Community elders/Traditional Authorities, land owners and Family Heads</td>
</tr>
<tr>
<td>Analyze the welfare and income impacts of existing land tenure regimes in the cocoa belt</td>
<td>Identify the impacts of existing land tenure regimes on community welfare, incomes and farmers’ ability to adopt practices that involve long term gain. Analyze the benefit sharing arrangements practiced in communities which will inform the recommendations of land tenure models, using a variety of methods to ensure that both quantitative and qualitative data</td>
<td>Logit Regression model for the impact Analysis Descriptive Analysis form Survey data/FGD information</td>
<td>Farmers (both migrant and native) in selected cocoa growing areas, AEDs, Farmers, Community elders/Chiefs other opinion leaders</td>
</tr>
<tr>
<td>Specific Activity</td>
<td>Methodology</td>
<td>Specific Methods</td>
<td>Source of information/Target groups</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Recommendations and proposal for improvements in land tenure regime to enhance sustainable cocoa production</td>
<td>Drawing from the above analysis, identify key constraints, gaps or obstacles to achieving sustainable cocoa production and benefit sharing regimes, and provide concrete recommendations for addressing the challenges.</td>
<td>Reflective Analysis</td>
<td>-</td>
</tr>
</tbody>
</table>

1.3.4 Theoretical and Conceptual Framework

The decision of farmers to adopt a technology or practice is however seen as single unit of package that is whether to adopt or not to adopt. The dichotomous nature of such decisions usually implies that the empirical model be specified as binary dependent variable model. Quite a number of studies have investigated the influence of certain socio-economic, cultural and political factors on the decision to adopt certain practices or not. In many of the adoption behaviour, the dependent index is a random variable which is constrained to lie between 0 and 1. Both Logit and Probit models are used in adoption studies. The choice to use either of the two depends on the distributional assumption one prefers to follow. The logit model follows a standard logistic distribution of errors whilst the probit model follows a normal distribution of errors. The probit model is mostly used when there a lot of the regressors in the model are dummy variables and the upper limit of the regressand is most recorded.

Following the various quantitative approaches used in analyzing adoption decision by the various literature reviewed, this work employs the Multivariate Probit (MVPROBIT) Analysis since there are more than two dependent dichotomous variables. The MVPROBIT is an extension of the probit model which simultaneously models the influence of a set of explanatory variables on each choice dependent variable (here, the various sustainability practices). In this model, the error terms are freely correlated with each other. The model has a structure similar to that of a Seemingly Unrelated Regression (SUR) model, except that the dependent variables are binary indicators. Hence, MVPROBIT uses a Simulated Maximum Likelihood (SML) estimation procedure to provide estimates of the coefficients (Cappellari and Jenkins, 2003). A number of studies including Wainaina, et al. (2014), Timu et al. (2014), Marenya and Barrett (2007) have all employed this approach in analyzing adoption decision of certain set of choice dependent variables.

The general model is specified as a set of M equations below:

\[ Y_{im}^* = \beta_m X_{im} + \varepsilon_{im} \quad Y_{im} = 1 \text{ if } Y_{im}^* > 0, \text{ and 0, otherwise} \]

\[ \varepsilon \sim N(0,V) \]
Where \( m \) represents the number of equations given as \( m=1,2…6 \)

\( Y_{im} \) * is the latent choice dependent variable of the \( m^{th} \) equation of the \( i^{th} \) observation measuring the adoption or otherwise of the following sustainability practices:

Explicitly model for this work is expressed in model (2) as:

\[
Y_{im} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \epsilon
\]

(2)

\( y_1 *= \) Replanting diseased and aged trees;
\( y_2 *= \) Safe use of agrochemical;
\( y_3 *= \) Tree planting within farms;
\( y_4 *= \) Soil conservation and management eg: use of organic fertilizers and proper & adequate application of inorganic fertilizers;
\( y_5 *= \) Prevention of killing/felling of trees;
\( y_6 *= \) Prevention of bush and wild fires;

\( \beta \) is the estimate coefficient
\( X \) is the set of independent variables
\( \epsilon_{im} \) are the error terms associated with each equation which has multivariate normal distribution with mean 0 and a variance covariance matrix, \( V \) specified in model (3)

\[
V = \begin{bmatrix}
    y_1 &= \beta_1 X_1 + \epsilon_{i1} y_1 & \text{if } y_1 > 0, y_1 = 0, \text{otherwise} \\
    y_2 &= \beta_2 X_2 + \epsilon_{i2} y_2 & \text{if } y_2 > 0, y_2 = 0, \text{otherwise} \\
    y_3 &= \beta_3 X_3 + \epsilon_{i3} y_3 & \text{if } y_3 > 0, y_3 = 0, \text{otherwise} \\
    y_4 &= \beta_4 X_4 + \epsilon_{i4} y_4 & \text{if } y_4 > 0, y_4 = 0, \text{otherwise} \\
    y_5 &= \beta_5 X_5 + \epsilon_{i5} y_5 & \text{if } y_5 > 0, y_5 = 0, \text{otherwise} \\
    y_6 &= \beta_6 X_6 + \epsilon_{i6} y_6 & \text{if } y_6 > 0, y_6 = 0, \text{otherwise}
\end{bmatrix}
\]

(3)

The Empirical Model: Analysing the factors influencing the decision to adopt a sustainability practice

The model for analyzing this objective is specified as follows:

\[
Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \epsilon
\]
Table 2.1 The variables in the model and their apriori expectations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Measurement</th>
<th>Aprior sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>X₁</td>
<td>Farm size</td>
<td>Hectares</td>
<td>+/-</td>
</tr>
<tr>
<td>X₂</td>
<td>Age of cocoa trees</td>
<td>Years</td>
<td>+/-</td>
</tr>
<tr>
<td>X₃</td>
<td>Age of Farmer</td>
<td>Years</td>
<td>+/-</td>
</tr>
<tr>
<td>X₄</td>
<td>Own land</td>
<td>Dummy (Yes=1; No=0)</td>
<td>+</td>
</tr>
<tr>
<td>X₅</td>
<td>Social capital</td>
<td>Dummy (member of a group=1; Non-member=0)</td>
<td>+</td>
</tr>
<tr>
<td>X₆</td>
<td>Residential status</td>
<td>Dummy (Native=1; Settler=2)</td>
<td></td>
</tr>
<tr>
<td>X₇</td>
<td>Gender of farmer</td>
<td>Dummy (1=female; 2=male)</td>
<td>+/-</td>
</tr>
<tr>
<td>X₈</td>
<td>Educational level of farmer</td>
<td>Levels (None=0; Basic=1; Secondary=2; Tertiary=3)</td>
<td>+</td>
</tr>
<tr>
<td>X₉</td>
<td>Tenure system</td>
<td>Dummy (Own land=1; Sharecropping=0)</td>
<td></td>
</tr>
<tr>
<td>X₁₀</td>
<td>Eastern Regional effect</td>
<td>Dummy Eastern Region=1; Otherwise=0)</td>
<td>+/-</td>
</tr>
<tr>
<td>X₁₁</td>
<td>Ashanti Regional effect</td>
<td>Dummy Ashanti Region=1; Otherwise=0)</td>
<td></td>
</tr>
<tr>
<td>X₁₂</td>
<td>Brong Ahafo Regional effect</td>
<td>Dummy (Brong Ahafo=1; Otherwise=0)</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Dependent variable Yi measured a dummy representing the adoption or otherwise of the following sustainability practices:

1. Replanting diseased and aged trees;
2. Safe use of agrochemical;
3. Tree planting within farms;
4. Soil conservation and management eg: use of organic fertilizers and proper & adequate application of inorganic fertilizers;
5. Prevention of killing/felling of trees;
6. Prevention of bush and wild fires;
7. Conservation of water resources;
8. Integrated crop management practices;
9. Ecosystem conservation; and
10. Wildlife protection.
2.0 Documentation and analysis of existing tenurial arrangements in cocoa landscapes

This chapter reviews that land tenure, ownership, use and rights in cocoa growing areas of Ghana. It focuses attention on the dynamics of changing land tenure and its impact on sustainable agricultural practices and sustainability of cocoa production. It argues that the dynamics of land tenure through increased commercialization and commoditization has influenced a myriad of changes in the cocoa cultivation landscape. There are three main sections on (i) existing tenurial arrangements in cocoa landscapes (ii) influence of land tenure regimes on environmental sustainability and (iii) review of methods in assessing the factors influencing decision to adopt long-term sustainable farming practices.

2.1 Existing tenurial arrangements in cocoa landscapes

2.1.1 Tenurial systems

Land tenure is referred to as a system of landholding, which has evolved dynamically and complexly from the peculiar socio-political and economic circumstances, cultural norms and religious practices of a people regarding land as a natural resource, its use, management and development. Implicit in this definition are the rules, regulations and institutional frameworks (statutory and customary), which influence the holding and appropriation of land and its resources for socioeconomic development. In sub Saharan Africa, land tenure systems have been described by some authors as flexible, complex and negotiable (Shipton and Goheen 1992; Amanor 2008) and sensitive to be explored or discussed in policy formulation.

According to Ampadu (2012) legally, all land in Ghana is vested in the state. However, land is predominantly regulated by customary rather than statutory laws. The state has the power to appropriate land anywhere in the country for development purposes; however, compensation has to be paid to the traditional owners. Although Ghana operates a heterogeneous and pluralistic land tenure and management systems, there are generally two main forms of land administration in the country, each governed by a different form of rules and laws enacted by the governing authorities. These are the state enacted laws and customary derived local norms and practices. These two systems within the national land administration system have coexisted since the days of colonization of Ghana till present (MFL, 1999) yet the rules governing access to land and rights to land differ under each regime. This may also vary from one community to another and therefore in the analyses of land tenure, discussions are usually focused on the locality or people or even crop under study. This is to make sure that the situation of the local community, customs and principles are taken into consideration. As Blocher (2006: 171) explained ‘well-drafted property laws do more than simply set down clear regulations for
people to follow and rules for them to respect. They build on social understandings already in place’. This therefore explains why this study aims at considering the land tenure situation or issues in cocoa growing areas of Ghana.

Generally customary lands are managed and allocated by the traditional or customary leaders such as the chief, clan heads, family or household heads among others according to the legal framework of Ghana (Act 267 of the 1992 constitution) (Ghana, 1992). Statistics indicates that customary land constitutes about 78% of total land size of Ghana (Kasanga and Kotey, 2001:13) while the remaining 22% is controlled and managed by the state of Ghana. This 22% constitutes 20 % out rightly owned by the state managed and controlled under statutory laws of the country and the remaining 2% is held in a dual relationship between state and community. In the latter arrangement, the state takes over the management responsibility for the land while the customary owners retain the ownership of the land. Through a state fiat, the government of Ghana is permitted to compulsorily acquire land for any purpose deemed relevant and appropriate by the state or the people (State Land Act, 1962 (Act 125) of Ghana (Ghana, 1992). Such state acquired lands are accessed through a government body, the Land Commission (LC) for purposes of national development. Customary land on the other hand is acquired through several diverse mechanisms such as gifts, settlements, purchase and (in the past) wars. Customary lands are entrusted in the hands of family or clan heads or chiefs who have dispositional rights to such land bequeathed to the families by their ancestors of great grandparents.

The constitution of Ghana under section 36 clause 8, under the Lands Commission Act, 1994 (Act 483), stipulates that ... *the State shall recognize that the managers of public, stool, skin and family lands are fiduciaries charged with the obligation to discharge their functions for the benefit respectively of the people of Ghana, of the stool, skin, or family concerned and are accountable as fiduciaries in this regard* (Ghana, 1992). This implies that apart from the two broad categorization of land, there are other groupings of land relations in Ghana recognized by the constitution. The specific categorizations of land types are:

- **Stool/Skin land** – The stool or skin lands are customary lands that are vested in a local authority or traditional head of a community or traditional area in trust for the people. The heads of the community, usually the chief and his councils of elders, have the mandate of the people and their ancestors to manage the land on behalf of the Stool or Skin.

- **Family land** – Family lands are also customary lands, which are collectively owned by an extended family or clan. Such lands might have been acquired through purchase, conquest or original occupation. Members of this group could be related by patrilineal or matrilineal lineages and must share a common ancestry.

- **Individual or private land** – This type of land is acquired and owned by individuals as their personal private property. In most cases such lands are acquired through purchase or inheritance. Decisions on land management are by the owner of the land without any sanctions or restrictions from the family.

- **State land** – As pointed out earlier, these are lands that have been formally acquired by the state in the interest of the public, and are managed on behalf of the people of Ghana.
Such lands can be returned to the original owners depending on government’s decisions or request by the people to have their land after government has not been able to use the land for the purposes for which it was acquired by the state.

- Vested land – Vested lands are those customary lands which have been acquired by the state and vested in the state. This arrangement creates a dual ownership by which the state holds the legal title while the community or original landowners use the land. Administration of such lands is vested in the President of Ghana through the land commission. Unlike the state lands, where compensation may be made, vested lands do not attract any compensation when the state takes over. In reality all these forms of land relations may coexist in the same community and people relate to them as defined by rules which govern local land access, control or management and use.

### 2.1.2 Tenurial systems among cocoa farmers

Development of commercial cocoa cultivation started in Ghana around the nineteenth century and ever since cocoa farmers have been migrating to cocoa growing areas from where ever they may find themselves in search of land to cultivate cocoa. As a result, this migration in search of land has been characterized by spontaneous occupation of the so called vacant lands mainly by migrant framers. Tracing its roots from the Akwapim ridge where the crop was first cultivated, cocoa has historically gone to places from its original home mainly by migrant cocoa farmers during the second half of the last century, to other places (Hunter 1961, Hill 1963, Johnson 1964). This early occupation of land was largely on land which was suitable for cocoa cultivation rights from the Krobo and Akwapim areas into the lands of south-east Akim Abuakwa (Amanor 1998 and Ampadu 2013). Cocoa is now cultivated in regions such as Eastern, Ashanti, Brong Ahafo, Western and Volta.

Oral history or tradition has it that the pioneer cocoa farmers took over land using different means including bloody wars and bloodless means or through renting and other forms of tenancy. It has been documented that there are differences in the evolution and allocation of land for cocoa in different regions or areas where cocoa cultivation currently occurs. Although these have received some modification, the practices have not deviated much. The rich and more powerful and their allies have always benefited from changes in the land rights systems to the detriment of the poor, vulnerable and less powerful (Goldstein and Udry, 2008; Ayeetey et al., 2007; Ubink, 2008; Amanor, 2010). In the Krobo area in the Eastern region for example, the natives after they have found cocoa to be profitable, used the huza system to claim lands from the neighboring Akan groups. After these lands were acquired, the captain of the asfoatse took control over those lands and distributed among the purchasers of the land according to each one’s contribution. Those with larger investment were given bigger portions as compared to those with smaller portions. At the height of production, land became scarce also because the construction of the Akosombo dam had flooded the Krobo area and taken a large piece of

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1 Huza was a system used to demarcate land in the past in order to ensure that fertile portions of land were shared equally among parties

2 Asfoatse were the war loads in the olden days
arable land. There was therefore a scramble for land acquisition elsewhere. There are recorded cases of several land litigations despite the patrilineal way of transferring of land rights.

Traditionally the Wassa people (mostly from the Western region) are hunters by occupation and therefore had little to do with farming. As a result and contrary to the people of Krobo who did not have the land to farm but as farmers had to migrate from Kloli in search for land, the people of Wassa did not see reason to go into farming as any serious venture even though they had easy access to land for farming. The chase for land in the Wassa area was poor or slow and therefore there was no scramble for land by the local people, especially the natives. Unlike the Klolis who were already cultivating oil palm before the introduction of cocoa, the people of Wassa were reluctant in accepting to grow cocoa. Rather they like the Akwapims and other Akan speaking people surrounding the Krolos, they were ready to allocate land to people (natives or non-natives) who were interested in cultivating the crop and in return they took money. People therefore began cultivating virgin forest lands the holders of such large tracts now lease portions to land-hungry farmers who have the money to rent or to buy outright.

The system of land allocation and distribution has always been different for whether one is a native or a migrant or even native youth. The variation in land arrangements and tenure rights has been attributed to differences in the socio-economic and cultural understanding of society by different people. While in most places natives are able to gain access to land by virtue of a social or family relation the migrant has to follow a different form of arrangement to be able to gain access to the land for farming. Migrants usually will go through certain formalities, which in most cases the natives would not have to go through in order to gain access to land for farming of cocoa. These systems are all based on communal system of most Ghanaians and also the reality that land was and has always been communally owned by kin groups and passed down from one generation to another through the matrilineal or patrilineal inheritance system. Even with the commoditization and commercialization of land access mechanisms and processes, land is still distributed through the cultural and social systems. For example a study by Ampadu (2013) indicates that among the Klolis land allocation is based on both formal and informal system, given the opportunity for the leaders or heads of families to have their way around land allocations. This has also been reported by Ubink (2005) in a study of land allocation by the chiefs of Besese in the Ashanti Region.

Anaafio (2011) reveals that there are about six ways by which a person can access land for the cultivation of cocoa including the following:

(i) Share cropping (abunu and abusa);
(ii) Rental;
(iii) Outright purchase;
(iv) Gifts;
(v) Inheritance; and
(vi) Common Property.
Share Cropping Systems

The two share cropping systems are known locally as abunu and abusa. There is also abuna which is rarely practiced. Under the abunu tenancy, the proceeds from the harvest or the farm may be divided equally between the tenant and the landowner. Before this division, the harvest from cover crops such as plantain and cocoyam is shared equally, usually after sales, between the landowner and the farmer. During the division of the proceeds, the landowner has the first choice of the products as divided.

In the case of the abusa, the ratio of the tenant farmer's acreage to that of the landowner is two to one. Again it is the landowner who has first choice, and in a large number of cases he takes care of the farm and harvests the crops himself. In some cases, however, the tenant farmer is employed to harvest the crop and take care of the farm for one-third of the harvest. In other cases, an entirely new person may be hired to take care of the farm under similar terms. An important feature of the share cropping agreement of land use is the relative contributions of labour and capital by the tenant farmer and the landowner. In the case of abunu, the landowner is expected to contribute labour, capital, and seedlings. This varies, however, with the individual agreements. In the case of abusa, however, the landowner contributes nothing apart from the tract of land; the share cropper is expected to use one-third of the harvested crop to finance the cost of operations on the farm and the other one-third as his personal remuneration, while the landowner receives one-third as his rent for the land. Under the share cropping tenancy, the tenant farmer is not free to cultivate any crop he likes without the consent of the landowner. Many share croppers claimed they had to obtain permission from their landowners before cultivating any crop not specified in the terms of the tenancy agreement – often oral in nature. There had been instances where defaulting tenant farmers had been ejected by aggrieved landowners.

The application of the two share cropping systems has however changed in the last twenty years. Formerly, landowners were not entitled to receive a share of food crops cultivated to establish the cocoa farms. However, in the last decade or so, food crops have become more profitable. Landowners are therefore demanding a share of the profits from the sale of food crops used as cover crops on young cocoa farms. There have been complains about some migrant farmers acquiring more land than the natives, land which they then sublet under share cropping to the latter. Migrant tenant farmers are also being restricted to cultivate the tree crops for which they originally acquired the land. This has at times left them with no land for growing food crops to feed their families. Some have therefore been forced to enter into new tenurial arrangements with landowners to acquire land solely for cultivating subsistence food crops.
Table 2.2 Sharecropping system and welfare conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Abunu</th>
<th>Abusa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Depends on agreement; Generally, the land owner gives out land to farmers to plant and care cocoa for an agreed period</td>
<td>Depends on agreement; Generally, the land owner farms cocoa and when cocoa reaches maturity, subcontract a caretaker/operator to take care of the farm</td>
</tr>
<tr>
<td>Contract term</td>
<td>Maximum 99 years (in accordance with new land administration policy)</td>
<td>Seasonally renewable – after every harvest (in accordance with new land administration policy)</td>
</tr>
<tr>
<td>Subject matter &amp; Payment system</td>
<td>½ of the harvest, or its cash value or the physical farm itself at an agreed stage of development</td>
<td>½ of harvest, or its cash value</td>
</tr>
<tr>
<td>Time of payment</td>
<td>Depending on the payment system</td>
<td>Depending on the payment system</td>
</tr>
</tbody>
</table>
| Contract | • Oral at the beginning of the contract with two or more witnesses  
• Written (after the 1st harvest)                                                                                                           | • Written  
• Mostly oral with two or more witnesses  
• Written (after the 1st harvest)                                                                                                           | • Written  
• Mostly oral with two or more witnesses  
• Written (after the 1st harvest)                                                                                                           |
| Other non-cash benefits | For the entire household  
• Housing  
• Food crops grown as intercrop in cocoa                                                                                       | • Assistance to rent house  
• Share of food crops on the farm  
• Separate plot for food crops                                                                                                        | • Food crops grown as intercrop in cocoa                                                                                                   |
| Type of work | All tasks on the cocoa Farm                                                                                                           | Weeding, harvesting, post-harvest activities                                                                                                    | All tasks on the cocoa Farm                                                                                                           |
| Conditions for termination | Criminal activity or offence                                                                                                      | • Illegal activities  
• Poor performance                                                                                                                                     | Criminal activity or offence                                                                                                      |

Secondary Data

Access to Land through Rent

People can access land for use through rent agreements. These are usually governed by informal arrangements with witnesses on both sides. Rent suffers from the same problems as outright purchase/lease as only marginal lands are rented out for agricultural uses. In 1962, following a recommendation by a committee on the need to control land rents, which were identified as one of the major causes of indebtedness of farmers, the government passed the Rent Stabilization Act (109), as amended in 1963 by Act 165, which authorized the appropriate minister to fix rent on land subject to the act. It made it illegal to demand or receive higher rent than that prescribed by the minister and prohibited ejection of tenants without his approval. The Cocoa Farm Regulation 1962 (LI.186) and 1965 (LI. 382) was the principal rent controlling regulation applied to cocoa land in the cocoa growing regions. It fixed rents at one shilling per acre for members of landowning groups and five shillings per acre for strangers. These measures provoked disputes in the cocoa-growing areas, especially in the new frontier zone, where there were clashes between tenants insisting on the protection of the enactments

14
and landowners who opposed the legislation. With a change of government in 1966, the act was repealed by NLCD 49. In consequence, the landowner tenant relationship reverted to the customary arrangements in existence before the coming into force of Act 109.

Access to Land through Outright Purchase

Land may also be obtained through outright purchase, even though some chiefs may refuse to acknowledge the transaction as a purchase. A migrant farmer requests land for farming from a chief. When his request is granted, the sub chief sends "boundary cutters" to demarcate an area for him and that becomes his plot. On the return of the boundary cutters, the sub chief, in acknowledgment of the transaction and on the advice of the boundary cutters, would charge the migrant farmer some amount of money, referred to as "drink" money, the payment of which grants the prospective farmer access to the land. Usually a document is prepared to cover the transaction, and the farmers pay surveyors to make plans for them. However, studies have shown that there are some controversy between landowners and migrant farmers over the question of whether such a transaction gives absolute title to the land to the farmer (Bassayin 1985). There have disputes concerning boundaries. While some chiefs tend to sell the same piece of land to more than one migrant farmer, some migrant farmers under the pretence of establishing large scale plantations, acquire vast stretches of land which they later sublease to new migrant farmers whose identities they conceal from the chiefs (Ubink, 2008). By this practice, the migrant farmers become landlords in their own right and charge higher rents to their fellow migrant farmers who, however, are late comers. These illegal deals come to light only when the new tenant farmers realize they are being cheated and seek redress from the chiefs.

Access to Land through Gifts

Access to land may also be obtained through gift by landowners to migrant farmers. This is done if the migrant farmer can establish that he belongs to the same clan as the landowning clan of the Wassa village where he has gone in search of land. The migrant farmer would obviously select the village carefully, after he had made preliminary enquiries. On arrival in the village, he would first introduce himself to the clan head as a member of the same clan in his home town. (There are representative segments of all the major clans throughout the Akan cultural region due to earlier population migrations). The clan head would in turn introduce the farmer to the chief of the village. The migrant farmer would normally offer a bottle of schnapps to the chief. If his claims are accepted he is accorded full membership in the clan in the Wassa village, on the basis of which he would then have access to clan land as a member of the landowning group. He pays nothing in return; he has only to discharge his civic responsibilities as a clan member. A large number of migrant farmers took this route to gain access to land twenty or more years ago when virgin land was not in short supply.

The migrant farmer may also obtain a grant of land through marriage. No restrictions are placed on the crops which can be cultivated on the land. The wife and the children resulting from the marriage would inherit the land or farm when the migrant farmer dies. If the marriage should break down, the farm or land would either revert to the wife or be shared between the two.
Inheritance

People who are subjects to the stool have rights of inheritance from their lineage when land is required for agricultural purposes. However, when it comes to acquiring land for residential purposes many prefer to buy in order to prevent future litigations with other family members.

Common Property

Some land resources are termed common property and all residents of the community have access to such resources. These are usually streams, grazing lands and game and wildlife. It has been found out that common property has come under severe stress due to lack of rules, and roles assignment to govern their utilization.

2.1.3 Dynamics in the Land use pattern and land tenure

Land use patterns change constantly from one location to another. Shifting cultivation leads to perpetual changes within the agricultural landscape pattern and are nowadays considered one of the main causes of deforestation, soil degradation and spatial expansion of agriculture at the expense of forest (Allen and Barnes, 1985; Oldeman, 1990; Mertens and Lambin, 2000). According to a study of the land tenure institutions in Western Ghana (Quisumbing et al. 1998), inherited and temporarily allocated family lands, which are characterized by weak land rights, are being transferred to wives and children as gifts, which have strong individual rights, conditional on the wife and children assisting with planting cocoa trees. Giving gifts is a way to circumvent the traditional Akan matrilineal inheritance system in which land is transferred from a deceased man to his matrilineal relatives, e.g., his brother or nephew, but not to his wife and children (Awusabo-Asare 1990; Migot-Adholla et al. 1993). Evolutionary changes in customary land tenure institutions have taken place to achieve greater efficiency in the use and allocation of land for food crop production and cocoa agroforestry.

Shifting cultivation implies that land will be periodically put to fallow in order to restore soil fertility. However, due to tenure insecurity under traditional land tenure institutions, there is no guarantee that the cultivator can keep fallow land for his or her own use in the future. The only feasible strategy to guarantee use rights is to use the land continuously. Thus, tenure insecurity induces the shortening of the fallow period, which is suboptimal from the cultivator’s viewpoint. In contrast, if trees are planted, individual tenure security is enhanced and rights to give land to desired heirs are strengthened. This is because work effort for planting trees is rewarded by strong individual land rights under customary land tenure rules (e.g. Shepherd 1991; Otsuka, Suyanto, and Tomich 1997). Thus incentives to plant cocoa trees are affected not only by tenure security, but also by its expected changes after tree planting. If tree planting enhances tenure security, incentives to carry out subsequent management of young trees through such activities as weeding and pruning may be high. Thus, once trees are planted, management efficiency may not be so different among parcels under different land tenure regimes. It is also expected that incentives to keep land fallow (which is no longer an option from the current field survey), to plant trees, and to manage them could be different even for...
parcels with the same tenure status (e.g., inherited land), depending on the initial level of land tenure security and its expected changes due to tree planting.

A study conducted in 10 selected villages in Western Ghana on land use and production of cocoa and food crops found that virgin forests have been already cleared by poor farmers. The challenge was then how to restore the tree resource base for environmental benefit while simultaneously improving the welfare of poor farmers. Here, feasibility to meet the two goals of environmental and welfare improvement through the development of cocoa agroforestry by examining the determinants of cocoa tree planting and the relative profitability of cocoa production compared with shifting cultivation of food crops was conducted. The study found that tree planting is affected not only by the strength of current land rights, but also by expected changes in land tenure security due to tree planting. Since both investment incentive and security-enhancing effects are present, the authors argued that whether the incidence of tree planting is lower under less secure, family tenure institutions is an empirical question. It was concluded that while tenure security would have a positive effect on tree planting, as argued by Besley (1995), its effect is not of overwhelming importance.

Goldstein and Udry (2008) show that in the Akwapim area of southern Ghana, there is a high degree of tenure insecurity, particularly during periods when land is left fallow for weed control and fertility regeneration. Individuals in this region primarily obtain land for cultivation by virtue of their membership in a matrilineage. While ‘in principle, any individual is entitled to use some portion of his or her family’s land, people’s abilities to exercise such claims vary a good deal in practice’ and depend in particular on their social and political status (Berry 2001: 145). Goldstein and Udry find that individuals who are not central to the networks of local political power through which land is allocated are very likely to have their land expropriated if it is fallowed. Women who do not hold a political office have more than a 40% chance of losing that plot in any year that it is fallow. The uncertainty associated with maintaining control over plots while they are fallow is pervasive in the area: even politically powerful men face a 20% chance of losing a plot in any year in which it is fallow. As a consequence, individuals fallow their land for much shorter durations than is technically optimal.

2.2 Influence of Land Tenure Regimes on Environmental Sustainability

Cocoa production in Ghana is influenced by environmental factors such as availability of forest land, ecological factors such as deforestation, disease outbreaks and geographic shift in production, economic and social forces such as migration (Vigneri and Santos, 2008). From the literature, the expansion of the cocoa industry and resultant forest loss was not only driven by the desire to increase national production, but was also a result of migrant farmers from North Burkina securing land tenure rights. Thus, tenure issues have been an ongoing problem and have facilitated forest loss by removal of forests to establish cocoa farms. Ghana has experienced significant forest loss as result of felling of trees for timber and expansion of cocoa farms through the promotion of zero shade cocoa production systems. This gradually led to fragmentation of forest landscapes, loss of wildlife corridors and forest connectivity, and degradation of biodiversity and the ecosystem goods and services these ecosystems offer.
cover or cocoa agroforestry systems provide natural forest mulching that reduces soil and water loss from erosion and from poor water infiltration and retention in the soil.

Low level of replanting is an additional threat to sustainability. In the past farmers found it more economical to expand than replant old and diseased trees (Vigneri, 2005; Ruf, 2001). The labor requirements were higher because it took twice as long to clear an old farm as it was to clear new forest land (Masdar 1997). Additionally, cocoa expansion was regarded as both an investment and a means to establish land ownership. This was an important point where the prevailing land tenure system in Ghana greatly affected farmers’ investment decisions (Awanyo, L. 1998; Quisumbing, A. R., et al. 2001, Sjaastad and Bromley, 1997). Given that migrants and sharecroppers represented an increasing share of the cocoa farming population, this implied that for many it was easier to acquire permanent land rights by expanding into new uncultivated land, where land ownership was established by clearing land and planting new trees (Amanor, 2010; Berry, 2009; Takane, 2002). However, land expansion is no longer an option for increasing cocoa productivity. Atkin and Eastin (2012) indicated that throughout Ghana’s high forest zone, cocoa farmers clear secondary or primary forest to establish new farms, capturing the capacity of nutrient-rich forest soils to increase cocoa yields. However, many cocoa farmers preserve remnant forest trees on existing farms as an integral and necessary component of the production landscape, making decisions about tree removal and tree retention based on a unique set of selection criteria. How they perceive trees play a crucial role in daily management decisions made at the micro level, which in turn influence landscape patterns on the macro level. This research identifies the important functions of forest trees as perceived by study participants, both as a biophysical component within the farm ecosystem and as an input to the rural economy. Some farmers preserve certain trees on their cocoa farms as house spirits.

According to Gockowski and Sonwa (2007), Ghana needs to fill a considerable yield gap in order to be competitive in the global cocoa industry. There is a significant loss of major soil nutrients as a result of deforestation, which has significantly affected cocoa production. This has been a leading cause of the gradual decline of national cocoa yields. However, Decisions involving investment on-farm and adoption of environmentally sound production practices are driven by Land tenure policy. Today farmers have very limited incentive to plant or maintain shade trees because of land tenure issues with landowners, and landowners have limited rights to naturally occurring trees on their land. There is also a lack of awareness about tree tenure rights. Unsustainable production methods have driven cocoa farmers to extend into forested areas but they are now left with little land for further expansion. The Cocoa Swollen Shoot Virus programme is aimed at rehabilitating cocoa farms to sustain cocoa productivity in Ghana. However, farmers have limited incentives and capital to successfully undertake rehabilitation and to manage farms in a more sustainable manner.

From the literature, a related issue to the causality between tenure security and agricultural investment is the lack of a common definition of security or insecurity of tenure. Insecurity of tenure is often perceived as the probability of losing ownership of the land (Sjaastad and Bromley, 1997). Roth and Haase (1998) offered a more comprehensive definition of security
of tenure as “the individual’s perception of his/her rights to a piece of land on a continuous basis, free from imposition or interference from outside sources, as well as the ability to reap the benefits of labour or capital invested in the land, either in use or in alienation”. For example, the right to recover an investment need not be related to the right to retain land, assuming some form of recompense could be provided for improvements made to the land (Barrows and Roth, 1989). Hence certain types of investment in land e.g. tree planting are a legitimate way of claiming more secure rights to land and such investments may be recovered even when land is lost (Sjaastad and Bromley, 1997). Therefore, the assertion then that insecurity in customary land tenure systems is a serious impediment to agricultural investment seems less convincing (Sjaastad and Bromley, 1997).

UNECA (2003) argued for tenure security to be investigated by assessing stakeholders’ own perceptions of their security of tenure and the results fed into measures that address questions of tenure security for these stakeholders. Pagiola et al. (1997) argued that similar to the investment effect argument more sustainable resource use is made by stimulating investments, which improve the long-term productivity of the land. Therefore farmers with registered land and security of tenure are more likely to undertake conservation measures on their land. Nonetheless, it is important to acknowledge that where insecurity of customary tenure exists it can be a major factor in poor agricultural production and environmental management. Thus it should not be assumed that statutory land tenure offers land tenure security for enhanced agricultural production and environmental sustainability. Other literature has also identified secure land and tree tenure as major factors in adopting on-farm tree planting, not only in Africa (e.g. Fortman 1985, Braselle et al. 2002), but also elsewhere (e.g. Dewees and Saxena 1997, Potter and Lee 1998).

Studies on land tenure regimes and sustainable cocoa production practices have produced context specific findings. Using the Sustainable Livelihoods Framework (SLF), Lambini and Nguyen (2013) provide empirically insights into how “forest institutional property rights” impact on forest communities' livelihoods and management. Their analysis provides support for the argument that forest institutional property rights play important role in the livelihoods of forest dependent communities and in forest management, but that can be context specific. The study suggests strong linkage between institutional property rights and sustainable livelihoods as a “panacea” for sustainable forest livelihoods and management in developing countries and therefore recommended a strong and clearly defined property rights and integration of formal and informal rights.

Fenske (2014) indicated that the existing literature on the relationship between property rights in land and agricultural investment in Africa has given results that are often confusing and contradictory. Studies with small sample sizes, those that use binary investment measures, and those that control for household fixed effects are less likely to find a statistically significant link between land tenure and investment. Self-reported tenure security has been a poor predictor of investment outcomes. It was also observed that the link between tenure and investment is significant for fallow and tree planting but less robust for labor use and other inputs, such as manure or chemical fertilizer. Deininger and Jin (2006) found that transfer rights
are unambiguously investment-enhancing and suggest that government action in Ethiopia to increase tenure security and transferability of land rights can significantly enhance rural investment and productivity. Kasanga (1994, 2001) has also observed some correlation between security of tenure and adoption of sustainable cocoa production practices in Ghana. Some authors have also argued that reduced insecurity would result in higher agricultural production or investments in agriculture (Pagiola, 1999).

Besley (1995) observed that enhanced security of tenure facilitated agricultural investment in the Wass area in Ghana, but the same conclusion could not be reached for the Anloga area, where no significant relation was found between security of tenure and agricultural investments. Abdulai et al (2010) examined the relationship between land tenure arrangements and households' investment in soil-improving and conservation measures in the Brong Ahafo region of Ghana. A major hypothesis tested is that investment in productivity-enhancing and conservation techniques are influenced by land tenure arrangements. The theoretical analysis and empirical results generally revealed that land tenure differences significantly influence farmers' decisions to invest in land-improving and conservation measures. The findings also showed that tenure security does affect farm productivity. Investigating the impact of ambiguous and contested land rights on investment in agriculture in Akwapim, Ghana, Goldstem and Udry (2008) indicate that those with secured tenure rights invest more in land fertility and have high output. In a study conducted by Danngay et al (2012), of the different tenure arrangements reported by 441 respondents, 42%, 25%, and 33% in the Forest Zone in Ghana were customary freehold, sharecropping, and leasehold arrangements, respectively. Under arrangements such as sharecropping and lease-holdings, farmers who engaged in short-rotation farming systems were hesitant to undertake long-term investments, such as tree planting. The study found out that the local tenure system contributes to deforestation because the rules governing land holdings create adverse effects. In dealing with this problem, policy reform is required that should target benefit sharing schemes, including future benefits from Payment for Environmental Services (PES), which until now has only benefited land owners. A study by Isaiido et al (2012) found that where virtually all respondents were owners of the land on which they planted trees none of the land where trees were planted was subject to a sharecropping arrangement. Van den Broeck et al. (2007) also found in their study that land-use rights positively impacted rice yields. All these suggest that proper land rights can have a greater impact on productivity and hence the food and income security of farmers. Another study by Isaidoo et al. (2014) and Rights and Resources (2008) also indicated that in Ghana, farmers with secure rights to land are more likely to plant trees on farmlands. In Isaidoo et al. (2014) study, majority (98%) of the respondents (with 63% of them being natives) were owners of the land on which trees were planted. This gives an indication that afforestation or reforestation activities can be promoted by the government aiming at mitigating climate change for a sustainable production levels to be realised. On the other hand, this implies that the farm level tree planting favours natives with ownership rights of land more than migrants who can plant trees only through tenancy (sharecropping) agreements. The issue of people having no secure rights and tenure over the lands and resources affects the possibility of promoting activities in the forest sector that are aimed at mitigating climate change and invariably sustainable cocoa production.
According to Platteau (1996, 2000) evidence that customary land tenure lacks security of tenure and that statutory land tenure has security of tenure is inconclusive. A causal-effect relationship was suggested between these two variables but this relationship did not allow them to conclude a priori that causality runs from enhanced land security to enhanced agricultural production and investments. It is quite possible that under statutory tenure farmers tend to register land parcels that benefit from comparatively high levels of investment, in which case private tenure does not stimulate investment but is only positively associated (Roth et al., 1994). It has also been noted that, to the extent that investment represents a visible commitment to the long-term productivity of the land, continued use of the land is implied and the common assertion that tenure security is necessary to promote investment may in many cases be reversed. Thus, although insecurity of tenure is a disincentive to invest, it is paradoxically, also an incentive because investment will itself increase security through raising the value of the land (Sjaastad and Bromley, 1997).

Otuska et al. (undated) in their study of land tenure and land management in Ghana found that while there is a tendency for more secure land rights to have a positive effect on tree planting, the results are not always consistent. Trees are more likely to be planted in land received as a gift, but not in appropriated and purchased village land and privately purchased land. Thus, cocoa is not significantly more likely to be planted on land with the strongest individual rights. The study concludes that while tenure security would have a positive effect on tree planting, its effect is not of overwhelming importance. In other words, the traditional land tenure institutions are generally not inefficient with respect to the decision to plant trees. However, land is more often left fallow in parcels with weak land rights under family ownership, which indicates the inefficiency of land use in shifting cultivation on area under the customary land tenure systems. The establishment of secure land tenure after tree planting, regardless of the manner of land acquisition, leads to equalization of management intensity in cocoa fields. This suggests that, given the almost complete individualization of land rights under some land tenure categories, traditional land tenure institutions in customary areas of Western Ghana have been sufficiently individualized to achieve farm management efficiency comparable to private ownership.

In contrast to the above observation, Owubah (2001) used Logistic regression models to predict willingness to engage in the preservation of indigenous, economically valuable trees, conservation of natural forests, and establishment of forest plantations. While most tenure variables behaved as expected, it was found that security of tenure and exclusiveness were less important to the practice of sustainable forestry. In the case of Ghana, it has been found that farmers with secure rights to land are more likely to plant trees on farmlands (Owubah et al. 2001).
2.3 Land Tenure, Sustainable Practices, Income and Livelihood Impact

Kazianga and Masters (2006) observed that increasing farmers’ land tenure security unambiguously raises their consumption and welfare, by supporting higher investment rates. But with traditional cocoa varieties, this increased investment takes the form of a relatively high rate of deforestation, because investing in existing plantations offers a relatively lower payoff than clearing new forest. Also they found that introducing new cocoa varieties with faster maturity and higher input response also unambiguously raises farmers’ consumption and welfare, by raising the payoff to all investment. But doing so under a relatively insecure rights regime further raises the deforestation rate. In contrast, doing so under a fully secure regime has the opposite effect, reducing the deforestation rate, as the new variety raises the relative payoff to further investment on existing plots. However, they concluded that when introducing the two innovations together (more security and also new varieties), there is a large increase in welfare and, on balance, a decline in deforestation. Thus, the benefits from the development of new cocoa cultivars for both farmers and the environment (in terms of slowing down deforestation) will be the largest if policies leading to more secure tenure over cocoa lands are implemented.

In analyzing the effects of farmer field schools in the cocoa belt of Ghana, Gockowski et al. (2010) found that the coefficient on $SHCROP$, the dummy variable indicating that the farm was acquired by an exchange of labor to create the farm for half of the farm developed in the regression model was negative. This suggests that farmers who were working on a sharecropped land had lower productivity. Kasanga & Kotey (2000) explained that this could reflect the fact that when the landowner divides the farm, there is a tendency to keep the better land and allocate the less productive share to the sharecropper. Isaidoo et al. (2012) suggested that further research is needed to be carried out to assess how farm size and tenure arrangements affect the adoption and continued engagement in tree planting, in order to obtain more insight into the question of whether tree planting is feasible for poorer farmers – usually migrants – who are engaged in sharecropping arrangements or who have small plots where the planting of trees may compete with food crops. Again the authors indicated that the kind of agroforestry scheme that is most appropriate for Ghana’s high forest zone, especially on fertile lands, is the integration of economic timber trees with permanent agricultural crops such as cocoa with initial integration of food crops. In this case the adoption of an appropriate tree-crop mix spacing is important to ensure reduction of shade effects, especially on adjacent agricultural crops. Such an agroforestry system according to them has a great potential for effective livelihood improvements since farmers can benefit from short-term income from food crops, medium-term income from permanent agricultural crops (that have an early maturity period ranging from 3-5 years) and long-term income from both the trees and permanent agricultural crops (Isaidoo et al. 2012).

Past and current studies have indicated that on-farm tree planting has potential to become an important element of farm livelihoods (Dewees and Saxena 1997; Isaidoo et al. 2012; Isaidoo et al. 2014) by creating high value tree assets for the future. However, several challenges adversely affect participants’ livelihoods and explain the mixed feelings among farmers about
current livelihood outcomes. Chamberlin 2008 suggested that in Ghana, it should be realised that on-farm timber tree planting is not based on farmers’ traditional farming systems, which in the high forest zone is mainly reliant on a combination of food crop farming (with cassava, maize and plantain as the main crops) and cocoa farming. He added that tree planting has primarily been driven by a government interest in addressing timber deficits and rural poverty and has been implemented from above. However, there are instances where tree planting have been an initiative of farmers themselves though not as a livelihood activity but a sort of practice to protect their plantations. Other studies have indicated that sustainable practices such as on-farm tree planting helps in the creation of human capital, physical capital, financial capital and social capital as a positive contribution to livelihood among households that practice it. Isaidoo et al. (2012) found that about 80% of farmers perceive on-farm tree planting as a safety net and not an activity they can obtain an adequate livelihood from in the short term. However despite that, a majority (86%) of the respondents in their study considered on-farm tree planting as a potentially important source of livelihood for the future, with the main reason being that it serves as a source of future income and creates a legacy for their children.

In view of the limited benefits farmers perceive of tree planting, their motivation for tree farm maintenance is restricted. In the study of Isaidoo et al. (2012), it was revealed that farmers started tree planting mainly because of high expectations of future income (93%), with having wood for house building (19%) and creating a legacy for their children (18%) as secondary motivations. However, a combination of high costs for tree farm establishment and maintenance, the long gestation period of trees and the lack of funds for tree farm maintenance once food cropping between the trees is no longer possible, has discouraged farmers and hampered the continuity and success of the scheme.

Profitability pattern of different tenurial arrangement studied also revealed that maximum yield was obtained by the owner category (342.8kg/ha) and minimum obtained by Abusa tenant category (199.3kg/ha). Since land owners tend to properly manage their own farms as compared to tenants. Estimated production cost derived by summing up all the monetary values of inputs (labour, agro-chemical and equipment depreciation) was maximum for Abunu owner category (GHC 921.07/ha) and minimum for Abusa tenant category (GHC 319.47/ha). This may be attributed to the high chemical incurred by the Abunu owner group. Eastern Region was found to have slightly higher tree shade density as compared to other regions studied. Soil parameters were higher in the Western Region and reflected in the fact that soils have been under cultivation for a shorter period. No direct relationship was found between soil degradation and lifespan of cocoa farms. Aneani et al (2012) indicated that adoption of cocoa production technologies recommended by CRIG (control of capsids with insecticides, control of black pod disease with fungicides, weed control manually or with herbicides, planting of hybrid varieties and fertilizer application were 10.3%, 7.5%, 3.7%, 44.0%, 33.0% respectively) has been low due to low accessibility to credit, number of cocoa farms owned, gender, age of cocoa farms, migration, cocoa farm size and cocoa yield. Drought and loss of forest cover were prioritized by farmers as issues needing urgent attention. In early 1980s drought led to bushfires that destroyed many cocoa farm; many smallholder farmers cut down the remaining cocoa trees to plant annual crops because of low cocoa prices and poor economic conditions.
The bush fires that led to loss of forest cover, also triggered further drought and associated global warming.

A baseline survey conducted under the Environmental Sustainability and Policy for Cocoa Production in Ghana Project (ESP) catalogued unsustainable production practices in the cocoa landscape involving (i) **Deforestation and habitat conversion** caused by the continued expansion of cocoa farms and the resultant human disturbance of forested ecosystems pose a serious threat to local biodiversity (ii) **Conversion of sustainable cocoa to unsustainable intensified production system associated with the** introduction of sun-tolerant hybrid cocoa. The weakness of the zero shade system was masked by the short-term yield increases driven by initially fertile forest soils. However, yields soon declined as forest soils were depleted of major nutrients. The practice of using zero shade production systems needs to be reversed (iii) **Unsustainable land management practices and resource use** associated with the use of slash and burn techniques has led to reduced soil fertility through elevated nutrient release, loss of soil structure and stability, and lack of natural forest mulching that reduces soil and water loss from erosion and from poor water infiltration and retention in the soil. It has been predicted that Climate Change effect will cause a drop in cocoa yield of 14% and 28% for 2020 and 2050 respectively. By 2080, moisture is predicted to be inadequate for profitable cocoa production in Ghana if the current trend is maintained.

Overcoming the threats mentioned above will require a considerable shift in cocoa farming and related practices. At the heart of this is a focus on establishing and maintaining forest tree species to favour species richness, alternative income options, habitat creation, crop microclimates, soil fertility, and reduced plant stress. This will need to be accompanied by other environmentally sound production practices that assist in the rejuvenation of ecosystem goods and services and on-farm biodiversity. Many of them are not fully understood, like the best practices for composting and soil management, water catchment to maintain soil humidity, pesticide usage, and others. These knowledge gaps need to be addressed by research. From the baseline results an underlying problem that will significantly hinder farmer uptake of environmental best practices is land and tree tenure policy. Tenure issues need to be resolved so that they are not a barrier to forest tree planting. Without suitable change it will remain difficult to encourage active planting and maintenance of trees on farms.

### 2.4 Review of methods in Assessing the Factors Influencing Decision to Sustainable Practices

In adoption studies, there are a number of approaches including both qualitative descriptive methods and quantitative methods. Qualitative methods usually uses a likert scale and descriptive statistical approaches to measure the extent of adoption whilst quantitative approaches are usually employed to assess the factors that significantly influence one’s decision to adopt a practice. Glover et al. (2013) for example used a simple qualitative description to discuss the various socio-economic factors that may influence a farmer’s decision to adopt agroforestry practices. The factors considered included accessibility to
market, household security, farm size, security of land and land tenure, labour, gender, knowledge of management practices, among others. Marenya and Barrett (undated) in their study considered the probit model to assess household level determinants of adoption of improved natural resources management practices among smallholder farmers in western Kenya. The results of the study indicated that but for the size of the farms considered, all other variables including education, non-farm income, previous adoption experiences and age of a farmers positively affected one’s decision to adopt agroforestry, manure application and fertilizer application practices.

In a study by Baffoe-Asare et al. (2013) which assessed the socioeconomic factors that influence the adoption of cocoa high-tech technologies among small holder farmers in the Central Region of Ghana, the Tobit model was used. Some of the variables considered in the model included social capital which measured one’s membership to a social organization, years of experience in the cocoa farming, age of the household head, size of the household, farm size and the age of cocoa trees. The empirical analyses of the study indicated that with the exception of farm size, all other variables including, experience, age, household size, gender, age of the farm, social capital and training strongly and significantly influenced adoption of Cocoa Disease and Pest Control (CODAPEC) programmes and the Cocoa High-Tech technology.

In analyzing the adoption decision of minimum tillage practice in Honduras, Arellanes and Lee (2003) used the Logistic regression model in their work. The results showed that plots with irrigation, plots farmed by their owners and plots with steeper slopes were more likely drivers for minimum tillage adoption. Farmer household characteristics were not generally found to represent significant influences on adoption. Teklewold et al. (undated) used a multivariate and ordered probit models to model adoption decisions by farm households using multiple Sustainable Agricultural Practices (SAPS) which can be adopted in various combinations. The results of their study indicated that both the probability and the level of decisions to adopt SAPs are influenced by many factors such as household’s trust in government support, credit constraint, spouse education, rainfall and plot-level disturbances, household wealth, social capital and networks, including the number of traders known by a farmer in his vicinity, his participation in rural institutions, and the number of relatives he has inside and outside his village, labor availability, and plot and market access. These results imply that policy makers and development practitioners whose aims are to strengthen local institutions and service providers, maintain or increase household asset bases, and establish and strengthen social protection schemes, can speed up the adoption of SAPs. The current study will attempt to address the issue of the relationship between tenurial arrangements and the decision for a household to adopt sustainable practices such as tree planting and soil conservation measures among others in the cocoa belt of Ghana.
3.1 Analysis of Key Informant Interviews and Focused Group Discussions

Diverse forms of land arrangements and rights co-exist in the districts surveyed. The survey findings revealed land types including stool lands, family lands and individual/private lands but there are variations across surveyed districts. Stool lands are customary lands vested traditional authorities or chiefs who have the mandate of the people and their ancestors to manage the land on behalf of the Stool. Family lands are also customary lands, which are collectively owned by an extended family or clan. Such lands might have been acquired through purchase, conquest or original occupation. Members of this group could be related by patrilineal or matrilineal lineages and must share a common ancestry. Individual or private land is acquired and owned by individuals as their personal private property. In most cases such lands are acquired through purchase or inheritance. Decisions on land management are by the owner of the land without any sanctions or restrictions from the family.

The communities surveyed in the Wassa East district in the Western region relatively had more family and individual lands as compared to the Fanteakwa, Amansie and Asunafo districts in the Eastern, Ashanti and Brong Ahafo regions respectively. The Amansie and Asunafo districts had more stool lands with the chiefs having dispositional rights over cocoa farmlands. Most chiefs interviewed were of the view that no land could be sold but rather leased and all family members working on stool lands had their land returned to the chief after their death or when the cocoa trees are cut off. According to the chiefs interacted with land exist for the living, the dead and the yet to be born and the power of a King is in his land, people and stool. Among the Ashantis, all land is declared as stool land until a tenure arrangement is reached. Anyone interested in acquiring land can have access without any discrimination against gender, age or nativity.

Land tenurial arrangements in the surveyed areas for cocoa farming include share cropping, inheritance, rental, gift and outright purchase in decreasing order of importance. The most commonly practiced access to land for cocoa farming are through sharecropping and inheritance. In the past *Abusa* sharecropping was usually practiced on turning forest into farm land (through cultivation of cocoa). The tenant effort of tending forest lands into cocoa farm was rewarded by taking two thirds of the proceeds. Currently, *Abusa* is practiced on already established cocoa farms and the tenant farmer takes a third for taking care of the cocoa. *Abunu* sharecropping is the most prevalent. The tenant farmer cultivates cocoa on farmlands and share proceeds equally with the land owner.

Under the share cropping tenancy, the tenant farmer is not free to make land improvement investment without the consent of the landowner. An important feature of the share cropping agreement of land use is the relative contributions of labour and capital by the tenant farmer and the landowner. In the case of *abunu*, the landowner is expected to contribute labour, capital, and seedlings. This varies, however, with the individual agreements. In some *abusa* sharecropping arrangement the landowner contributes nothing apart from the tract of land; the
share cropper is expected to use one-third of the harvested crop to finance the cost of operations on the farm and the other one-third as his personal remuneration, while the landowner receives one-third as his rent for the land.

In all the surveyed areas cultivation of cocoa on forest lands strengthen security position on the land. Land rights are strong\(^3\) on individual or private and stool lands with proper documentation. The tenure processes with the highest security were gift, purchase and inheritance but purchase sometimes may be accompanied with forged documentation if the consent of the chief is not sought. Relatively weak land rights were observed among those who had temporal land allocation by the family. In this case tree planting even though not restricted was not an easy decision for the tenant farmers to do. Security of tenure and financial security in old age are critical in decisions to adopt sustainable cocoa production practices. Incentives to invest in land controlled by customary land tenure rules and norms are weak as these could vary from place to place and may be dependent of those involved in the arrangement.

Majority of the cocoa farmers interviewed in Fanteakwa and Wassa East districts were migrants. Land use rights are somewhat stronger in migrant villages presumably because migrants are less subject to the tradition and culture of the local indigenous family land ownership system. These strong land rights were made possible because they were seen as rewards for efforts put in to bring the forest into farmlands and therefore the cultivation of value crops such as cocoa. Family lands have a lot of disputes issues due to land being passed on from one generation to the other and sometimes losing it real ownership. It also came to light that those who cleared and purchased formerly forested land whether indigenes or migrants recorded strong land rights. These arrangements were described as more permanent. In some cases inherited lands also procured weak rights as people feared land could be taken away from them and not passed onto direct (nuclei) families upon their death. This was observed in purely matrilineal system of inheritance. Yet in spite of these most of the farmers were sure of benefiting from tree planting before their demise.

Family lands were said to be the least sought after because it is too fragmented and one is not likely to get a sizeable land for farming the crop. Again, family lands are not transferable to children. Non-permanent land tenure systems faced the challenge of being taken away from the tenant farmer in cases where the tenant farmer becomes disrespectful or lazy and other signs that show that he or she will not be able to work on the land. Documentation of land avoids encroachment by the indigenes and subsequent police interventions.

Responses to changes in land tenure arrangements with regards to cocoa farming varied across surveyed areas and among different people as well. Currently, direct purchase of land is not allowed except in rare cases when a land owner or his/her family is facing real financial challenge. Even in that case the land is only leased for a period not more than 55 years which is renewable. Land could also be gifted out given certain conditionality, usually upon one doing something extremely good like diligently serving the chief of the town and the community very

\(^3\) A strong land right means that the individual in question has more control over how a parcel of land should be used as opposed to a weak land right whereby the individual has not much control over land use.
well. These forms of Land tenure arrangements have continued for generations and have not yet changed by substance except the mechanisms in some cases. Land has become scare with only government or state lands available. Virgin lands are non-existence in all the surveyed areas except for forest reserves managed by the Forestry Commission. Therefore increasingly *Abusa* arrangement is changing into *Abunu* for incoming tenant farmers on already cultivated lands. In the Wassa Mpongoh East District, a slightly different *Abusa* arrangement with a third of the cocoa proceeds reserved to cater for inputs cost, and the landowner and tenant farmer take a third each as their benefits persist on already established cocoa farms. Formerly, landowners were not entitled to receive a share of food crops cultivated as cover crops on cocoa farms. However, in the last decade or so, landowners are demanding a share of the profits from the sale of food crops used as cover crops on young cocoa farms (See Annex for detailed interviews).

### 3.2 Survey findings from structured one-on-one interviews

#### 3.2.1 Land Tenurial Arrangement in the cocoa growing areas surveyed

Generally, permanent land arrangement allows for permanent decision making. A lot of decisions depend largely on the land owners including decisions on uptake of sustainable practices. Decisions on land investment are better made by the land owners. In respect of uptake of sustainable practices, inheritance arrangement is better as compared to sharecropping that largely depends on land owners decisions and the social relationship between the land owner and the tenant farmer. *Abusa* arrangements on already established cocoa farms where the tenant farmer takes a third of the produce may not allow for total commitment and dedication to work. In this case labour needed for tree planting and uptake of other sustainable and environmental practices may suffer. The land arrangement determines uptake of sustainable practices but to a large extent profitability counts. Tenure arrangement goes with efforts needed to farm. Some farmers do not take environmental sustainability programs seriously. Some land owners may not be interested in tree planting because of their age and financial standing. Landowners have so much power to make decision on land investment. Some farmers are ignorant about environmental harzards and others are not ready to accept education on environmental sustainability.

Overall about 61.7% of the cocoa farmers interviewed said that land tenurial arrangement affects uptake of sustainable production practices in cocoa farming (Figure 3.1).
Primarily, family and individual lands were acquired for cocoa farming in the districts surveyed accounting for approximately 56% and 37% of the sample interviewed respectively. Individual acquisition (self owned) and stool lands accounted for 9.5% and less than 1% of the sample interviewed respectively as shown in Figure 3.2.

Figure 3.1 Influence of Land Tenure Arrangement on Uptake of Environmental Practices

Can Land Tenure arrangement on cocoa farms influence farmers uptake of environmental practices?

<table>
<thead>
<tr>
<th>District</th>
<th>% Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fantekwa</td>
<td>92</td>
</tr>
<tr>
<td>Amansie West</td>
<td>21.4</td>
</tr>
<tr>
<td>Asunafo North</td>
<td>55.6</td>
</tr>
<tr>
<td>Wassa East</td>
<td>76.1</td>
</tr>
<tr>
<td>Overall</td>
<td>61.7</td>
</tr>
</tbody>
</table>

Figure 3.2 Land Types used in the cocoa growing areas surveyed

<table>
<thead>
<tr>
<th>Land Type</th>
<th>% Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Owned</td>
<td>9.5</td>
</tr>
<tr>
<td>Family</td>
<td>56.3</td>
</tr>
<tr>
<td>Individual</td>
<td>37</td>
</tr>
<tr>
<td>Stool</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Cocoa farmers interviewed have fragmented farm sizes with an average landholding of 2 different plots per farmer and a maximum of 6 different plots. Average farm size ranged between less than 1 hectare and 27 hectares with an average estimate of 3 hectares in the surveyed areas. There was variation in the land tenurial arrangements used on different plots as shown in Figure 3.3. In the Fanteakwa district, tenurial arrangements among farmers interviewed were sharecropping (43.1%), Inheritance only (37.3%), Sharecropping and inheritance (7.8%), sharecropping +Inheritance + Outright purchase (7.8%) outright purchase only (2%) and Inheritance and rental (2%).

In the Amansie West district, tenurial arrangements among farmers interviewed were gift (36.4%), sharecropping only (18.2%), Inheritance only (12.7%), Freehold (9.1%) sharecropping and gift (7.3%), sharecropping +Inheritance + gift (7.3%), outright purchase only (1.8%), rental only (1.8%) and Inheritance and sharecropping (1.8%). For those who practiced sharecropping, abunu was largely used accounting for 28.9% of the sample interviewed.

In the Asunafo North district, tenurial arrangements among farmers interviewed were gift (26.7%), sharecropping only (24%), Inheritance only (20%), sharecropping and gift (8.9%), inheritance and gift (8.9), freehold (4.4%), outright purchase only (2.2%), inheritance and sharecropping (2.2%) and gift and outright purchase (2.2%). For those who practiced sharecropping, abunu and abusa accounted for 50.0% and 23.5% of the sample interviewed respectively.

Figure 3.3 Land Tenurial arrangement in the cocoa growing areas surveyed
In the Wassa East district, tenurial arrangements among farmers interviewed were sharecropping only (48.1%), Inheritance only (26.6%), sharecropping and inheritance (10.1%), rental only (6.3%), freehold (3.8%), gift (2.5%), outright purchase only (1.3%) and sharecropping and gift (1.3%). For those who practiced sharecropping, *abunu* and *abusu* accounted for 27.8% and 22.8% of the sample interviewed respectively.

About 71% of the total sample interviewed said that they did not have to renew their tenurial arrangements. This suggests that land tenurial arrangements for cocoa farming are probably long term. However, there were variations in responses to renewal of rights over land for cocoa farming across districts surveyed. Renewal of land rights was high in Fanteakwa (44%) and Wassa East (42.3%) as oppose to Amansie West (3.6%) and Asunafo North (20%). Land tenurial arrangement is violated if the tenant farmer becomes disrespectful, lazy, incidences of non-performance as well other signs that show that he or she will not be able to work on the land.

The study findings also showed a significant correlation between residential status (Native or settler) and renewal of rights over land - Correlation was significant at the 0.01 level (2-tailed). About a third of the total sampled interviewed was of the view that permanent land tenancy allow for tree planting than the non-permanent ones. About 24.8% of the sample interviewed said that adoption of tree planting practice is dependent on the social relation between the tenants and the landowner as well as the expected benefits arrangement or tree tenure. While 27.7% of the sample interviewed were indecisive on actual factors influencing adoption of tree planting practice in cocoa farms. Majority were not too clear about the benefit sharing arrangement among landowner, tenant farmer, Government and the Assembly in relation to tree planting in cocoa farms.

### 3.2.2 Ease of access to land for cocoa farming in the areas surveyed

From the survey findings it was observed that access to land for cocoa farming in the areas surveyed was difficult (see Figure 3.4). Land for cocoa expansion was just unavailable. Overall about 38.5% and 41.2% of the sampled interviewed reported that access to land were not easy/difficult and not easy/difficult all respectively. Cocoa farmers interviewed explained that the few land available are either Forest Reserves or distance lands far from settlements.
Figure 3.4 Ease of Land Access for Cocoa farming in the districts surveyed

Figure 3.5 presents challenges with land access for cocoa farming in the various districts surveyed. There were variations in the reported challenges with access to land across districts. In the Fanteakwa district, challenges reported by cocoa farmers in accessing land were unavailability of land, difficulty with access, land disputes and high cost of land in decreasing order of importance. In the Amansie West district challenges reported were mainly unavailability of land (61.9%), high cost of land (33.3%). A similar trend was observed in the Asunafo North district where challenges reported by cocoa farmers were mainly unavailability of land (64.5%) and high cost of land (32.3%). Challenges with accessing land in the Wassa East district were land sales to Rubber Company (62.8%), difficulty of access (12.8%) and high cost (14.1%) among others.
3.2.3 Dynamics in land tenurial arrangement in cocoa growing areas surveyed

Majority (74%) of the cocoa farmers interviewed had observed changes in land tenurial arrangements over the years. Currently land has been commoditized as opposed to a social product in the past. There are competing demands for land for various purposes and for cultivation of crops other than cocoa. Various mechanisms of access to land have been commoditized. For example instead of providing drinks monetary value is paid. There is increasing need for proper documentation as opposed to verbal arrangements in the presence of a witness. Competition for land has pushed the price upward. Transferring rights over lands especially family lands to wife and children has become extremely difficult and may result in land disputes.

In some cases *Abusa* for cultivating forest lands is no longer in existence since most forest lands have been exhausted. *Abunu* sharecropping arrangement is mostly practiced on already existing cocoa farms. As depicted in figure 3.6, over 70% of the total sample of cocoa farmers interviewed attributed changes in land tenurial arrangement to population increases with its attendant high migration to cocoa growing areas in search of off-farm jobs. Increasing land sales particularly for rubber plantation in the Wassa East district have caused a lot of changes in land tenurial arrangement. Stool lands are leased to the Rubber Companies for 99 years. Family and individual lands are being taken over from tenants to these rubber plantations. In the Fanteakwa district farmers reported of replacing cocoa farms into crops that attract more profits.

Other factors influencing changes in land tenurial arrangements are bushfires and shifting cultivation which were prevalent in the past. From the literature, shifting cultivation leads to
perpetual changes within the agricultural landscape pattern and considered as one of the main causes of deforestation, soil degradation and spatial expansion of agriculture at the expense of forest.

**Figure 3.6 Factors affecting changes in land mechanisms for Cocoa farming in the districts surveyed**

<table>
<thead>
<tr>
<th>Factors Affecting Changes in the Land Tenurial Arrangement in the districts surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over all</td>
</tr>
<tr>
<td>Wassa East</td>
</tr>
<tr>
<td>Asunafo North</td>
</tr>
<tr>
<td>Amansie West</td>
</tr>
<tr>
<td>Fanteakwa</td>
</tr>
</tbody>
</table>

3.2.4 Suggestions for improvement of Agriculture land for Cocoa Cultivation by Respondent in the surveyed districts

In the Fanteakwa district, the following suggestions were made in decreasing order of importance:

- Proper Documentation (40.0%);
- Release of Forest Reserves (13.0%);
- Release of Government land (13.3%);
- Government policy on land (13.3%);
- Good Cocoa Price (6.7%);
- Input Cost sharing arrangement (6.7%); and
- *Abusa* Abolished (6.7%).

In the Amansie West district the following suggestions were made in decreasing order of importance:
• Release of Forest Reserves (42.9%);
• Proper Documentation (28.6%);
• Resolution of land Disputes (14.3%); and
• State Ownership of Agricultural lands (14.3%).

In the Asunafo North district the following suggestions were made in decreasing order of importance:

• Release of Forest Reserves (46.2%);
• Financial Assistance (30.8%);
• Reduce Cost of land Access (15.4%);
• Government policy on land (3.8%); and
• Proper Documentation (3.8%).

In the Wassa East district the following suggestions were made in decreasing order of importance:

• Proper Documentation (53.8%);
• State Ownership of Agricultural lands (23.1%);
• Education on land Registration and proper Acquisition (12.8%);
• Reduced Cost of Access (7.7%); and
• Input Cost Sharing Arrangement between Land Lords and Tenant (2.6%).

Table 3.1 Summary (Pooled) of Suggestions for improvement of Agriculture land for Cocoa Cultivation by all the cocoa farmers interviewed

<table>
<thead>
<tr>
<th>Suggestions (Decreasing order of Importance)</th>
<th>% Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Documentation</td>
<td>(34.5%)</td>
</tr>
<tr>
<td>Release of Forest Reserves</td>
<td>(19.5%)</td>
</tr>
<tr>
<td>State Ownership of Agricultural lands</td>
<td>(11.5%)</td>
</tr>
<tr>
<td>Financial Assistance</td>
<td>(9.2%)</td>
</tr>
<tr>
<td>Reduced Cost of Access</td>
<td>(8.0%)</td>
</tr>
<tr>
<td>Education on land registration and proper acquisition</td>
<td>(5.7%)</td>
</tr>
<tr>
<td>Government policy on land</td>
<td>(3.4%)</td>
</tr>
<tr>
<td>Release of Government land/Forest reserves</td>
<td>(2.3%)</td>
</tr>
</tbody>
</table>
## Suggestions (Decreasing order of Importance) % Response

<table>
<thead>
<tr>
<th>Suggestions</th>
<th>% Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input cost sharing arrangement (relative contributions of labour and capital by the tenant farmer and the landowner)</td>
<td>1.1%</td>
</tr>
<tr>
<td>Resolution of land Disputes</td>
<td>1.1%</td>
</tr>
<tr>
<td>Good Cocoa Price</td>
<td>1.1%</td>
</tr>
<tr>
<td><em>Abusa Abolished</em></td>
<td></td>
</tr>
</tbody>
</table>


3.3 Land Tenurial Arrangement and Adoption of Sustainable Production Practices

3.3.1 Sustainability Measures Practiced by Cocoa Growing Communities

The adoption decision to practice one or more sustainable practices in the various cocoa producing areas covered by this study is influenced by a number of factors. In this section we will focus on some of these factors with key interest in how tenurial arrangement influences the adoption and practice of the various sustainability measures. From the survey, the top ten (10) practiced sustainability measure in the various cocoa producing regions studied is presented in Table 3.2.

Table 3.2: Ranks of Top 10 Frequently Practiced Sustainability Measure

<table>
<thead>
<tr>
<th>Sustainability practices</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree planting within the farms for canopy and carbon</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.818</td>
<td>1</td>
</tr>
<tr>
<td>stock enhancement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil conservation and management</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.675</td>
<td>2</td>
</tr>
<tr>
<td>Safe use of agrochemicals/ prevention of pollution of</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.545</td>
<td>3</td>
</tr>
<tr>
<td>water bodies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevention of bush and wild fire</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.381</td>
<td>4</td>
</tr>
<tr>
<td>Prevention of killing/ felling of trees on farms</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.338</td>
<td>5</td>
</tr>
<tr>
<td>Replanting old and diseased cocoa trees</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.286</td>
<td>6</td>
</tr>
<tr>
<td>Forest buffer zones and corridors</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.285</td>
<td>7</td>
</tr>
<tr>
<td>Establishment of forest plantations</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.281</td>
<td>8</td>
</tr>
<tr>
<td>Preservation of indigenous trees</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.277</td>
<td>9</td>
</tr>
<tr>
<td>Conservation of natural forest</td>
<td>231</td>
<td>0</td>
<td>1</td>
<td>0.269</td>
<td>10</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>231</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 3.2, the most frequently practiced sustainability measure is tree planting within the cocoa farms and the least being the conservation of natural forests. Usually, cocoa farmers plant trees within the farms to provide shade and recently to increase carbon stocks. However, it is important that farmers plant only tree species using the right planting distances as per CRIG recommendations. For the purposes of establishing a quantitative measure for the factors influencing the practice of the various sustainability measure listed above in Table 3.2, the first 6 practices are analysed. The Multivariate regression analysis was used for this analysis given that the dependent variable was not dichotomous in nature. Also to make the analysis easier, the various tenurial systems were divided into two broad categories. The categories are **Own land** and **Sharecropped land**. All farmers who had acquired their lands in the form of outright purchase, inheritance, gift/donation are all classified under the Own land category and those who had acquired land through a sharecropping arrangement of either *abunu, abusa* or *abuna* were all classified under the Sharecropped category.
3.3.2 Factors Influencing the Adoption of Sustainability Practices

The various factors identified as could be influencing the decision of farmers to adopt or not to adopt a sustainability practices were the scale of operation (farm size), the age of the cocoa trees, the age of the cocoa farmer, social capital (a measure of one belonging to one social group or more), residential status, the gender of the farmer, the educational level of the farmer and most importantly the tenure system a farmer is practicing. It was postulated that there could be variations in the four regions studied in respect of their adoption of sustainability practice and hence variables capturing regional effect was also modeled in the analysis. The Western Region of Ghana was used as the base or reference point with no particular reason except for it being the highest cocoa producing region in the country.

3.3.2.1 Replanting diseased and aged trees

The loss in cocoa productivity has been mainly attributed to diseased and the old age of cocoa plantations in Ghana. Cocoa tree replanting practices has been advocated for by a number of both governmental and non-governmental agencies. However among the practices that was listed and observed in the study areas, cocoa tree replanting was the 6th most practices measure to ensure both environmental sustainability and higher productivity. Onumah et al. (2013) found that all input variables contributed positively to productivity of cocoa farms in Ghana with the exception of the age of cocoa trees which had a negative influence on productivity. Hence to ensure higher output and environmental sustainability, it is imperative for farmers to cultivate the habit of replanting old and diseased cocoa trees.

The factors that positively influenced the practice of cocoa tree replanting from the study were found to be the age of the cocoa trees, the age of the farmer, social capital, gender, tenure system and farm size. This implies that farmers, who had much older cocoa trees, had a higher incentive to adopt the replanting practice than farmers who had cocoa farms that were quite young. This is expected because there is no incentive for one to cut down young farms and replant as this is only practiced and rational among old cocoa farms. Cocoa farmers who were aged were also seen to be practicing the tree replanting exercise. This could be due to but not limited to the fact that older cocoa farmers will have older plantations compared to younger cocoa farmers.

Farmers who belonged to one social group or the other, such as Farmer Based Organisations were also seen to be practicing this measure compared to their counterparts who had no social capital at all. Male cocoa farmer were seen to be adopting this practice as well. This could be attributed to the lower participation of females in the cocoa industry in Ghana. Onumah et al. (2013) observed that only 20% of the farmers interviewed were females. In this study however, about 30% of the respondents were females and hence their participation in such programmes will be lower compared to their male partners. Farmers who had larger farm sizes surprisingly were found to be practicing this measure. This is very encouraging given that it is easier to

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4 Results of the Multivariate regression analysis is found in Appendix 3
manage a smaller farm size than a larger farm size but still farmers in the study areas who had larger farm sizes were practicing this sustainability measure.

Most importantly for the purpose of this study, farmers who had complete ownership over their lands were found to be practicing this measure compared to those who were practicing the sharecropping system. This is in confirmation to the previous descriptive discussions concerning the rights of land and the adoption of a sustainability practice. All things being equal, farmers who had complete rights to their land are at liberty to adopt a long term practice such as cutting down old and diseased trees and replanting with new ones. Farmers under the sharecropping system will have to seek consent from their landowners before they can adopt such a measure. If sharecroppers feel their land owners might not give them their consent, then they will as well not take the pain to go through adopting such a practice.

Cocoa farmers in the Eastern, Brong-Ahafo and Ashanti regions were found not to be practicing this measure compared to farmers in the Western region. This could be that there is a more awareness and sensitization on the negative impact of diseased and aged trees in the Western region compared to the other three regions. It is however not surprising that the Western region of Ghana records the highest level of cocoa production in the country. Natives of a particular region also practiced this measure more than settlers. This is quiet understandable given that settlers know that they are not permanent residents and may also not even have complete ownership on the land they farm and hence adopting such long term measure can be impossible.

### 3.3.2.2 Safe Use of Agrochemicals

Aged cocoa farms and farmers, social capital, tenure system, Eastern region and Brong-Ahafo regional farmers were the factors and characteristics that positively influenced one’s decision to practice the safe use of agrochemicals so that it does not have any negative consequences on the environment and water bodies. Farmers who had aged cocoa farms had a greater incentive practicing the safe use of agrochemicals. This could be due to the reason that old cocoa farms have low productivity levels and hence to augment this, farmers need to apply chemicals in the right proportion to ensure good yields. Therefore, unsafe application is just not an option for such group of farmers. Also farmers who are aged could use their experience in ensuring safer use of agrochemicals giving why old farmers are the more adopters of this particular practice.

Farmers who belonged to an FBO or any other social group were again seen to be practicing the safe use of agrochemicals. The social groups these farmers belong to especially the FBOs teaches the farmers some good agricultural practices and hence the adoption of these practices to by farmers who had access to social capital.

Here again, farmers who had complete ownership over their lands were found to be practicing the safe use of agrochemicals on their farmers compared to farmers who practiced the sharecropping system. Farmers under the sharecropping arrangement may have low sense of ownership and may see the cocoa farm as a “common property” good and hence not taking so much good care of it. This is one of the significant variables that affect the adoption decision.
of the various sustainability practices observed in the various cocoa growing communities. On the other side, Farmers in Eastern and Brong Ahafo regions were found to be practicing the safe use of agrochemicals compared to those in Western and Ashanti regions.

The scale of production (farm size), residential status, gender and higher educational levels were the factors that negatively influenced the adoption of safe use of agrochemicals. Given that large scale is difficult to manage and it could lead to decreasing returns to scale, it is not surprising that farmers who operate relatively larger farm sizes had difficulty practicing the safe use of agrochemicals. This is not a good sign for sustainability and productivity because in as much as we would want to see a higher level of productivity in Ghana’s cocoa, we cannot trade it off with environmental sustainability. The negative consequences of this practice could be detrimental and possibly lethal if our farmers are not encouraged to practice the safe use of agrochemicals on their farms.

Female farmers and farmers with high level of education were also found to be practicing less of this measure. The results on the educational level is quiet surprising because one would have easily judged that the highly educated will find it easier adopting good agricultural and environmental sustainability practices. The explanation that could be given to this finding could be that farmers who are highly educated might have other engagements aside farming and hence may pay less attention to the practices of farming compared to their other formal engagements. Also they may not make enough time and efforts to attend extension training and advisory support services, leading to their poor adoption habit of sustainability practices.

3.3.2.3 Tree Planting within farms

Knowing the right level of shade/canopy for cocoa plantation is one key factor that could either promote or inhibit growth and productivity. Tree planting within farms can act as a protective barrier against bad weather conditions as mentioned earlier. Farmers who had relatively large farm sizes, practiced the own land tenure system, had advanced in age, were males, natives of the land and had cocoa trees that were aged were found to be practicing the tree planting measure.

Tree planting within farms is a long term and fixed practice therefore the decision to adopt the practice is taken by considering a number of factors on the side of the farmer. It is therefore not surprising to find that farmers who had complete ownership over the lands they farm on are those that adopt the practice as compared to those who practice the sharecropping system. Also farmers with larger farm sizes are at risk of losing a lot if something goes wrong due to poor shade and canopy on the farm and hence were found to be those who adopted this practice more than those who operated on a smaller farm size. Then again, farmers who had advanced in age could use their experience to their benefit since they may know the pros and cons of tree planting within the farms and hence were found to be practicing a lot more of the measure than younger farmers.
One unanticipated finding was that of farmers who had some form of social capital not adopting the tree planting practice. This is quite surprising given that most of the practices discussed so far were practiced mostly by farmers who had social capital. It is possible that the focus of the social groups these farmers belong to may be skewed to replanting activities and conservation measures other than tree planting for canopy and shade on the farms.

Once again, Eastern, Ashanti and Brong Ahafo regional farmers and farmers with higher level of education were found not to be adopting the tree planting practice as compared to Western Regional farmers. This could be as a result of regional geographical differences between the regions and also the level of importance one placed on a particular sustainability practice given the terrain.

3.2.4 Soil Improving and Conservation Measures

Some of these measures included mulching and other soil erosion control practices. The factors that positively influenced the decision to adopt these measures included farm size, the average age of the cocoa trees, age of the farmer, access to social capital and the tenure system a farmer is practicing. This implies that farmers with relatively larger farm sizes rather have the spur for the practice of soil improving and conservation measures compared to those with small farm sizes. This is equally encouraging giving that large scales are difficult to manage at times depending on the resource availability.

Farmers with social capital and practicing a complete land ownership system were also found to be practicing these measures as well as farmers who had older cocoa farms. As mentioned earlier, having complete ownership over the lands that one farms on gives the farmer a lot of control over the management and practices on that land. This inherently makes adoption decisions easier and hence allows one to adopt practices that will be in their absolute best interest and that of the farm enterprise.

From the analysis there seem to be poor level of adoption of sustainability practices among farmers in the Eastern, Ashanti and the Brong Ahafo regions given that Western regional farmers were again found to be practicing these soil improving and conservation measures as it was in the previous measures discussed except for the safe use of agrochemicals which was observed to be practiced most in the Eastern and Brong Ahafo regions.

Female farmers, settlers and farmers with higher level of education were also found to be not practicing soil improving and conservation measures. Then again, the same reason given in the previous discussion can be attributed to this as well.

3.3.5 Prevention of killing/felling of trees on farms

Brong Ahafo and Ashanti regional farmers were found to be engaged in this practice more than farmers in the Western region of Ghana. Natives of the community also had higher incentive to prevent the felling of trees on their farm lands. This could be due to the sense of ownership
these indigenes have towards their properties. Farmers with owned farm lands were also found to be engaged in the prevention of felling of trees compared to those under the sharecropping system. Again, it can be said that having complete ownership over the lands that the cocoa production activities take place on allows one to be flexible with the adoption of certain long term/fixed practices including the prevention of tree felling on the farms.

On the other hand, female farmers, farmers with social capital, larger farm sizes, higher education and from the Eastern region were found not to be practicing this measure compared to their counterparts. Difficulty with management can be seen as the contributing factor to farmers with larger farm sizes not adopting the practice. It has been observed in the analysis that female farmers generally are poor adopters of the various sustainability practices observed in the study areas. Therefore it is advised that the capacity of the female cocoa farmer be built for them to be able to stand up for the adoption of these practices that have long term positive impact on productivity levels of their cocoa farms.

3.3.6 Prevention of bush and wildfires

Harsh weather conditions can trigger fires as well as indiscriminate hunting activities in and around cocoa farms or any other plantation/vegetation. Therefore it is important for farmers to see it as a matter of urgency the need to prevent such occurrences from happening. From the analysis, farmers who had the greatest urgency in preventing these bush and wildfires were those of larger farm sizes, older cocoa plantation, had access to social capital, female farmers and farmers in the Ashanti and Brong Ahafo regions. It is reassuring to note that female farmers at least practiced one of the top six (6) sustainability measures identified in the cocoa growing communities.

One striking result of the analysis was the fact that farmers under the sharecropping agreement for the first time were seen to be adopting a sustainability measure compared to those under the owned land tenure system. The reason for this finding could be that since sharecroppers are not the owners of the lands they farm on, they are more liable to any catastrophe that might occur on the lands and its plantation. Therefore they are keen in protecting the cocoa farms from accidents such as bush and wild fires in order to save them from the cost they might incur upon themselves, peradventure if it happens. It can then be seen that farmers under the sharecropping agreements are more interested in adopting the measure that will save them from any unplanned charges and cost and not necessarily measures that will increased productivity whilst at the same time ensuring environmental sustainability.
### Table 3.3 Adoption of sustainable practices and Land Tenurial Arrangements in the surveyed districts

<table>
<thead>
<tr>
<th>Sustainable Production Practice</th>
<th>Land Tenurial Arrangements in the Cocoa growing areas surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abunu Sharecropping</td>
</tr>
<tr>
<td>Replanting of Old and Diseased Cocoa Trees</td>
<td>Commonly practiced in all the district surveyed. Rights over land relatively stronger than Abusa but still need to consult with landowner. Depends on the social relation of the landowner, age and financial status. Tenant farmers risk losing the land to the owner. In most cases tenancy is revoked ones cocoa trees are felled.</td>
</tr>
<tr>
<td></td>
<td>Landowner if well documented Takes decision depending on the age and financial status and expected changes in benefits. No risk of losing land when cocoa trees are cut</td>
</tr>
<tr>
<td>Planting of Trees to restore the tree resource base for environmental benefit while simultaneously improving the welfare of poor farmers</td>
<td>Land investment decision and need to consult land owner. Incentives to plant trees are affected by tenure insecurity by its expected changes after tree planting. If tree planting enhances tenure security, incentives to carry out subsequent management of young trees through such activities as weeding and pruning may be high.</td>
</tr>
</tbody>
</table>

<p>| Planting of Trees to restore the tree resource base for environmental benefit while simultaneously improving the welfare of poor farmers | Land investment decision and need to consult land owner. Incentives to plant trees are affected by tenure insecurity by its expected changes after tree planting. If tree planting enhances tenure security, incentives to carry out subsequent management of young trees through such activities as weeding and pruning may be high. | Land investment decision and need to consult land owner. Incentives to plant trees may be affected by tenure insecurity by its expected changes after tree planting. If tree planting enhances tenure security, incentives to carry out subsequent management of young trees through such activities as weeding and pruning may be high. | Some inherited lands procured weak rights as people feared land could be taken away from them upon their death. However, if trees are planted, individual tenure security is enhanced. Non permanent rights over land need to consult with Landowner. | Takes own decisions over tree planting If trees are planted, individual tenure security is enhanced. | Takes own decisions over land need to consult with Landowner. | There is permanent right over land. Takes own decisions over tree planting if tree tenure is beneficial to him/her |</p>
<table>
<thead>
<tr>
<th>Sustainable Production Practice</th>
<th>Land Tenurial Arrangements in the Cocoa growing areas surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Erosion Control</td>
<td>Rights over land relatively stronger than Abusa but still need to consult with landowner over adoption of soil conservation measures</td>
</tr>
<tr>
<td>Safe Use of Agrochemicals</td>
<td>More of a short term decision Adoption of safe use of agrochemicals is high in all the districts surveyed. Decision to adopt this practice does not necessarily involve landowners.</td>
</tr>
<tr>
<td>Creation of Buffer Zones</td>
<td>This was difficult to practice on already established farms and particularly on small farm sizes in almost all the district surveyed</td>
</tr>
<tr>
<td>Environmental risk factors</td>
<td>Ecosystem destruction through burning and bush fires attract some penalty</td>
</tr>
</tbody>
</table>
4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion
There are two main forms of land administration including (i) state enacted laws and (ii) customary derived local norms and practices in Ghana. Each is governed by a different form of rules and laws enacted by the governing authorities. Generally customary lands are managed and allocated by the traditional or customary leaders such as the chief, clan heads, family or household heads among others according to the legal framework of Ghana (Act 267 of the 1992 constitution). Customary land is acquired through gifts, settlements, purchase and (in the past) wars. Customary lands are entrusted in the hands of family or clan heads or chiefs who have dispositional rights to such land bequeathed to the families by their ancestors of great grandparents.

Land can be accessed through share cropping (Abusa, Abunu and Abuna), rental/lease, outright purchase, gifts, inheritance and common property. The most commonly practiced arrangements are sharecropping and inheritance. Efforts involved in turning forest lands into cocoa farms are rewarded with relatively stronger land use rights with tenant taking two thirds of the proceeds. Caretaker tenants take a third of the proceeds. Abunu sharecropping is usually practiced on already established cocoa farms. The tenant farmer share cocoa proceeds equally with the landowner. Under the share cropping tenancy, the tenant farmer is not free to cultivate any crop he likes or make land improvement investment without the consent of the landowner.

Virgin lands are non-existence in all the surveyed areas except for forest reserves managed by the Forestry Commission. Therefore increasing cocoa production through farm expansion is no longer an option in all the areas surveyed. The challenge here is to meet the dual goal of environmental sustainability and welfare improvement of farmers through adoption of cocoa sustainable production practices. This requires efficient land tenurial systems in cocoa growing areas. There have been gradual changes in customary land tenure arrangements for cocoa farming to enhance tenure security through formal agreement and documentation.

Farmers have limited incentives and capital to successfully undertake cocoa rehabilitation and to manage farms in a more sustainable manner. In most of the surveyed areas the only feasible strategy to guarantee use rights over land for cocoa farming is to use the land continuously. This negatively affects decisions to fell aged and unproductive cocoa trees for replanting. In some areas if trees are planted, individual tenure security is enhanced and rights to give land to desired heirs are strengthened. Tree planting is affected not only by the strength of current land rights, but also by expected changes in land tenure security. Farmers with registered land and security of tenure are more likely to undertake conservation measures on their lands. From the literature, tenant farmers have very limited incentive to plant or maintain shade trees because of land tenure issues with landowners, and landowners have limited rights to naturally occurring trees on their land. Cocoa farmers interviewed in the Eastern region confirmed that
trees on cocoa farms virtually belonged to the state under the exclusive management of the Forestry Commission. Awareness about tree tenure rights among cocoa farmers is lacking.

Literature review showed that transfer rights are unambiguously investment-enhancing (Deininger and Jin 2006) and there is some correlation between security of tenure and adoption of sustainable cocoa production practices (Kasanga 1994, 2001). These results are context specific. For example Besley (1995) observed that enhanced security of tenure facilitated agricultural investment in the Wassa area in Ghana, but the same conclusion could not be reached for the Anloga area.

From the current study, relationship between land tenure arrangements and households' investment in soil-improving and conservation measures varies across localities and also largely depends on the social relation between tenant farmers and landowners, economic status of landowners and age. However in most districts surveyed, land tenure differences significantly influence farmers' decisions to invest in land-improving and conservation measures. Invariably tenure security does affect farm productivity.

The various factors identified as could be influencing the decision of farmers to adopt or not to adopt a sustainability practices were the scale of operation (farm size), the age of the cocoa trees, the age of the cocoa farmer, social capital (a measure of one belonging to one social group or more), residential status, the gender of the farmer, the educational level of the farmer and most importantly the tenure system a farmer is practicing.

Farmers benefit from short-term income from food crops, medium-term income from permanent agricultural crops (that have an early maturity period ranging from 3-5 years) and long-term income from both the trees and permanent agricultural crops (Isaidoo et al. 2012). Again from the literature on-farm tree planting has potential to become an important element of farm livelihoods (Dewees and Saxena 1997; Isaidoo et al. 2012; Isaidoo et al. 2014) by creating high value tree assets/economic trees for the future. The benefits from the development of new cocoa cultivars for both farmers and the environment (in terms of slowing down deforestation) will be optimized from policies leading to more secure tenure over cocoa lands.

Challenges to cocoa farmers include accelerating labor costs, expensive fertilizers, lower price quotes of cocoa beans by the government, bad silos and high replacement costs as well as land tenure disputes. Land tenure disputes can be effectively resolved if proper documentation of agreement is encouraged. A major challenge in the Wassa East district is replacement of cocoa farms with rubber plantations.

**4.2 Recommendations**

**Education on land and tree tenure rights among cocoa farmers is critical:** The right to recover an investment need not be related to the right to retain land, assuming some form of recompense could be provided for improvements made to the land. Policy reform targeting benefit sharing schemes for current and future benefits from payment for Environmental Services (PES) is required. Government of Ghana should develop an action plan to increase tenure security and transferability of land rights to enhance land investment and productivity.
Education on land Registration and Proper Acquisition of land: It became clear that most of the farmers interviewed knew very little or nothing about the current land registration exercise. It suggests that land registration has been rather slow and has not been extended enough. While the state is doing its best to create awareness about the new system of land registration, there still seem to be a large lacuna regarding land registration information to farmers and other rural people. The flyers and public lectures are not enough, especially in a system where the literate population is far less than their counterpart illiterate farmers in remote villages. It is suggested that the educational campaigns will be stepped up in the society or communities through intensive and sustained public education in the major local languages within the registration districts and in the media.

From the validation workshop it was recommended that Land Administration Project (LAP) should lead in educating the landowners and tenant farmers as well as other custodians of land such as chiefs on land registration through the local governance structures and the cooperative unions at the community level.

Proper Documentation: As a matter of fact most of the conflicts that have taken lives and destroyed properties in the country can be associated with conflicts over lands. This is as a result of poor documentation of lands in Ghana. There is therefore the need to initiate or strengthen the process of farm land documentation in the country. It was clear from the study that majority of the farmers did not have proper documentation on their lands. This confirms the assertion in the public and also at the state level (Lands and Administration of stool lands) that 80 per cent of lands in Ghana have no proper documentation, and this has resulted to the numerous land disputes all over the country. A proper documentation of lands will ensure adequate security over land tenure rights as well as stop the many litigations and unproductive hours in the rural areas. Proper documentation of such lands will help farmers to be able to secure loans (another major problem of farmers) with their landed property. Clear input cost sharing arrangement should be integrated in the land tenurial mechanisms.

Financial assistance to cocoa farmers to access land: Farming is becoming more and more expensive for the poor farmer. This is as a result of the declining soil fertility which has come about as people continue to cultivate a particular land for very long time. Inputs for the combat of pest and other diseases of cocoa are also critical. Today land acquisition has become more of monetary or economic issues than social and therefore many a young men who want to cocoa farming will need money to be able to access land.

Quick Resolution of land Disputes: The difficulty with which one gains access to land for the cultivation of cocoa is creating a lot of problems of disputes in rural communities. It is important that all users of land especially for cocoa cultivation should be educated about the proper chancel to follow in order to acquire land for the cultivation of cocoa. In addition to the court system and the establishment of the customary land secretariat in some communities, the state should endeavor to put in place alternative dispute resolution mechanisms for settling disputes on general agricultural land and particularly for cocoa farming. Alternative Disputes Resolutions (ADRs) could be used at the community level properly by the Union Executives.
as stipulated in their constitutional mandate or rights. For example, the CREMA Concept in Asunafo North.

**Good and equitable Cocoa Price:** Farmers interviewed in this complained about the low cocoa price offered by government. They complained that the poor pricing of the beans and high cost of inputs make cocoa farming unattractive to the youth who are expected to take over from the ageing cocoa farmers. Since most of them do not actually know how cocoa prices are fixed, it would be appropriate to get the farmer groups educated on matters such as this—pricing of the bean. Good Cocoa Price will make cocoa farming more attractive and help reduce land sales for other purposes such as rubber plantation as observed in the Wassa East District in the Western Region.

Other suggestions for improvement of access to agriculture land for cocoa cultivation by farmers interviewed in the surveyed districts are bulleted below:

- Government policy on land tenurial arrangement for cocoa farming;
- Release of Government lands for cocoa farming;
- Back filling rehabilitation of mined areas in the cocoa belt
- Clear definition of who a cocoa farmer is and interest of tenants farmers captured in the scholarship schemes for cocoa farmers
- Local level actions against illegal mining activities and impact on coca farming
- Education on proper land tenurial agreement between land owners and tenant farmers through CocoaBod Extension Messages, sensitization at Cooperative meetings and Civil Society Coalition on Land workshops
- More education on Land Administration (LAP) work at the district and community levels- Need more communication, dialogue and information dissemination at the local level using the local level governance or cooperative structures
- CocoaBod to take the lead on mapping of the cocoa landscape and institute pre-financing arrangement for cocoa farmers
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Annex 1: Key Informant Interviews and Focused Group Discussions

1. **Nana Opoko - Traditional Leader of Akyem Abuakwa, Bosuso in the Eastern Region**

From his point of view, sustainability is to do with something lasting. The Bosuso land was bought from the Chief of Akyem by the Krobos and Akwapim Kyerepons. The land was bought by Tawiah & Co (from Akwapin Kyereponi) and Atterkye & Co (From Krobo). All the different land systems – Abusa, Abunu, Rental, Gift, Customary Right, Stool land, Inherited, outright purchase coexist in the area. Mostly Sharecropping is practiced; Abunu for cocoa and Abusa for food crops farming. With Abusa there are more land disputes, land can just be taken away from the caretaker. There is more security with Abunu where usually the cocoa trees are planted by the tenants.

By the traditional rule, once land is acquired, a sheep has to be slaughtered to seal any arrangement whether verbal or written. Rental lands are usually not suitable for cocoa farming but for short term maturity crops. Again land rental is not a common practice and only done when landowners are in dire need of money. Outright purchase is also not common. This is only done under urgent money needs conditions. Explaining further, he mentioned that land is not usually sold since is for prosperity – passed on as a major inheritance. Land only appreciates so it does not make economic sense to sell.

There are two types of agreements – Verbal and written. Now mostly written or documented under Commissioner of Oath as compared to verbal arrangement in the past. There is payment of drinks, commitment fee and actual agreement.

In 1983, there was bushfire that burnt a lot of the cocoa trees and as a result most lands were converted to food crops cultivation. Expansion of cocoa farms is currently difficult, most lands are degraded now. With buffer zone people are worried especially those with small land size but ecosystem destruction attract some penalty.

2. **Interaction with Francis Aneani - Socio-Economist CRIG, Tafo in the Eastern Region**

There is some differentiation with Abunu – In most cases land does not belong to the tenant farmer, rather land is leased out and the chief will have to endorse. In few cases, the tenant farmer get to own the land eventually. When cocoa is diseased and is felled, land reverts back to the owner. This poses a constraint to cocoa tree planting exercise. There is another type of sharecropping - Abusa Ndaho - the tenant farmer has to do additional work of food crop cultivation. By Cocobod policy, farmers are to cut down trees aged 30 years and above and are given some compensation. There is a system for cutting in stages. Cocobod gives seedlings for replanting, CSSVD – cocoa farms are rehabilitated. Investing in the land is problematic because land owners are unwilling to give money for inputs. According to him they give safe
concentration levels of spraying so buffer zones are not very necessary. Investment in Land may include erosion control measures, cover trenches on the land with sand bags. These are done by Landlords. Most tenants are interested in getting cocoa and money. They may end up losing the land so making investment in the land is out of the question.

Security of tenure and financial security in old age are key amongst the main objectives of cocoa farmers, but do not imply a need to increase productivity. Documentation of land avoids encroachment by the indigenes and subsequent police interventions.

The Ghana cocoa sector is dominated by small farms of less than 15 acres, the average productivity of which is extremely low; in the range of 300kg/ha. The cocoa cycle commences with new planting, continues through to a farm’s old age. Its two fundamental and interlinked characteristics are forest rent and migration. Low returns to cocoa farming due to the fact that farmers receive just about half the world price of cocoa. Need for incentives that encourage farmers to increase productivity. Ghana cocoa is facing a huge challenge with respect to availability of new lands for cocoa farming, land is exhausted or nearing exhaustion. In the past cocoa farm expansion was done by migration of farmers to forested lands. Now this option is no longer available. The solution now is for farmers to intensify their production on existing lands (CRIG,) to increase productivity rather than expansion of land area. Also there is the need to cultivate neglected lands but these are currently being used for food crop cultivation. There is a challenge of social unrest associated with loss of access to land for many, and the inability to do more than subsist on what is left. Productivity improvement should be a concern to all stakeholders – CRIG, CSD, policy makers. Some farmers are prepared to increase productivity given the right incentives. The prosperity of cocoa farming is not just a matter of price incentives but also social, institutional and ecological factors that can influence productivity.

Family land – Arrangement under which cocoa farm is cultivated by a farmer on family land

Abusa - Arrangement under which a tenant is made to establish a cocoa farm to maturity and the farm or subsequent cocoa beans or proceeds are divided into two equal parts, one part for the owner of the land and the other for the tenant

Abusa – Cocoa farm is managed by a tenants who receives a third of the farm proceeds, with two third for the farm owner

Abusa Nhaho – an arrangement where an abusa tenant is made to perform additional duties as a compensation for enjoying an already matured farm.

3. Interview with Cooperative leader – Humphry Ayisi Fanteakwa Cooperative Union President (0247691293)

Abusa land tenure arrangement has implications for the adoption of technology in cocoa farming. Abusa labourers do not have direct control to decisions of investment on the farms. UNDP ESP offer training on tree shade management, sustainable cocoa practices and provision of seedlings for tree planting. Challenges here include family land disputes usually settled
through negotiation with family heads, elders and chiefs. Membership of the Bosuso cooperative is 151 but district level members of 1400. Adjeikrom has about 80 members.

4. Interview with Begrohene – Osaberima Awuah Kotoko II – 0244232575
The stool has 5 Divisional Chiefs. The chief claimed that all the lands under his jurisdiction are stool lands. There are no outright purchased lands or private lands. According to the Chief land for cocoa farming in Adjeikrom belongs to the stool.

5. Interview with Augustus Kwadwo Mireku (024564000) – One in charge of stool lands at the District Assembly
According to the District Assembly no revenue is collected from Bosuso and Adjeikrom. The implication is that these are not stool lands. Since revenue is collected from all those using stool lands in the area. A lot more people are changing from the Abusa system to Abunu for cocoa farming. Rental lands are used for annual crops and not for cocoa. Rent collected is estimated at GHC10/acre/year.

6. Interview with Owusu Yeboah (0244-816731) - Deputy District Cocoa Officer in Tafo
Farmers are not willing to cut down diseased and old cocoa farms due to land tenure issues. Eastern region lands are usually not given for outright purchase. There is also free land or common land which could be used for annual crops and not for cocoa farming. Outright purchase is more secured because there is always proper documentation. Factors affecting cocoa farming in the area are

- Land tenure system
- Limited lands
- Scarcity of labour
- High cost of inputs
- Age of farmers

With respect to compensation paid to cocoa farmers for felling of diseased and old trees, Cocoa Health gives a total compensation amount of GHC 1290 but staggered by 30% Initial treatment grant and replanting grant of 70%. Cocoa health also give seedlings for tree planting but advise that Forestry is consulted for the tree tenure arrangement on planted trees. Seedlings given include Termilia spp which takes 10 years to mature, Cyandellah spp which takes 5 years to mature.

7. Focus Group discussion in Adjeikrom (Composition of 18 men with 5 females)
Land tenure system pertaining are family lands, owners, outright purchase and sharecropping. The land in Adjeikrom was bought from the Begro Chief by Ako Adjei (who was from La-Accra). Land Acquisition arrangement involves drinks and commitment fee in the presence of a witness. This is verbal agreement until the cocoa start fruiting before written documentation
is signed. Out of a total of 18 people, 8, 9 and 1 were land owners, Abunu and Abusa land arrangement respectively. In terms of land security, the group mentioned outright purchase, Abunu, family land and Abusa in decreasing order of importance for cocoa farming. Here with the Abusa, the land owner takes a third, a third caters for input cost and the tenant farmer takes a third. According this group of cocoa farmers, family lands have a lot of disputes issues due to land being passed on from one generation to the other and sometimes losing it real ownership. Formerly they used flowers for demarcation without any proper documentation. For Sharecropping, when cocoa dies the land usually revert back to the owner this poses problems on replanting of old farms.

For forest or virgin lands, land is shared under Abunu arrangement. But this was not a common practice since there are no more forestlands more or less. In some cases production cost is deducted before sharing of proceeds. This is what the legal system recommends but land owners are not in agreement. Trust is key and underscores revoke of the land tenure arrangement. Sharing arrangements for tree tenure are 50% owner, 40% for Government and 10% for the chief.

Challenges with land access are as follows:

- Limited lands
- Disputed Lands are usually not cultivated
- Forest Reserves
- Issues with land tenure
- High cost of production affecting sharing of proceeds
- Shifting from cocoa to other annual crops

8. Focus Group Discussion and Interview with Nana Opia Mensah – Chief At Manso Mem (Amansie Wast)

Nana Opia Mensah II, Otumfu’s Wirempheene’s main responsibility is the blackening of Otumfu's stool and all other arrangements that have to do with the burial of the Asantehene. In his palace, Atta Yaw (linguist), Obeng Owusu Emmanuel (cooperative union president), Ohene Baffuor Kumah (honorary registrar of traditional council), Frederick Anane Peprah, Rosemond Addei and James Osei Mensah (all cocoa farmers) made great contributions to the focus group discussion.

Nana Opia Mensah started his speech by stating that all land tenure arrangements in “Asanteman” were the same. He reiterated this point to make it clear that nothing can be changed about the tenurial systems and that all lands belonged to the stool of Ashanti. Only some deviant chiefs (“Odanmaning” as he puts it) had twisted land tenure arrangements to suit their interests. Yet when discovered, such chiefs and elders are brought to book and dealt with severely. Nana continued and said that after the great Denkyira War, a chief was sent from Asanteman to be the “oman no aso” in Denkyira and therefore the name “Manso” was coined. The early settlers of Manso cultivated plantain and “funtum”, then they were later introduced to rubber and cocoa due to rising literacy.
It was clear from the discussion that the following five rights were being practiced in the communities around. These include rights to: (1) plant and replant trees, (2) to rent out land, (3) to bequeath, (4) to give, and (5) to sell. Even though they existed in the community their frequency as well as strength varied from one arrangement to another and the person involved as social relations and cordiality played a key role in this exercise. The not very strong land rights were observed among those who had temporal land allocation by the family. In this case tree planting even though is not restricted was not an easy decision for the tenant farmers to do. In some cases inherited lands also procured weak rights as people feared land could be taken away from them and not direct (nuclei) their families upon their death. This was because unlike other places in the country the system of inheritance is purely matrilineal. Yet in spite of these most of the people were sure and could plant the trees. They did because they look at their age and were sure that could plant the tree and benefit from the gains before their demise. It also came to light that those who cleared and purchased formerly forested land whether indigenes or migrants recorded strong land rights. These arrangements were described as more permanent.

The land rights are somewhat stronger in migrant villages presumably because migrants are less subject to the tradition and culture of the local indigenous family land ownership system, yet the group we were told form a small fraction of the population of farmers. These strong land rights were made possible because were seem as rewards for efforts put in to bring the forest into farmlands and therefore the cultivation of value crops such as cocoa. Our observation and analysis of the discussions show that the strongest land rights are observed in cocoa farm arrangements where the land received as gift by the current landholder. As pointed out earlier, gifts are usually made by a father or mother to his children and sometimes husband to wife, and the opposite was rare. This arrangement of giving land to someone as a gift was concluded after a consensus with members of the extended family has been reached. This suggests that it will not always be true for someone to assume that incentives to invest in land controlled by customary land tenure rules and norms are weak as these could vary from place to place and may be depended on those involved in the arrangement.

As confirmation, Nana said no land could be sold but rather leased and all families members working on a particular land had their land returned to the chief after their death or the cocoa trees were cut off. Land could also be given out as gifts to both natives and foreigners. There is no discrimination as to age or gender in tenure arrangements. As far as Nana Opia was concerned, there had been no changes in land tenure arrangements with regards to cocoa farming. Nana also confirmed that his jurisdiction covered about seventy one (71) square miles.

Another way by which individuals could lose access to land and land rights is outright sales of land, which is tantamount to sale of rights and power of the people. That amounts to betrayal and such people are often brought to book and dealt with. Nana said. Nana Baffuor Kuma contributed to the discussion by saying that land exist for the living, the dead and the yet to be born and the power of a King is in his land, people and stool.

The Abunu sharecropping tenure system practiced in Manso – Mem normally matures after a period of six (6) years. Land tenure arrangements in Manso – Mem are dynamic and flexible.
in that, they allow for a mix of Abunu, Abusa and other agreements in case the original arrangement terminates prematurely. An interesting finding in Manso – Mem is the payment of a customary monthly levy on land which reinforces an individual’s right to ownership over land.

8. Interview with Nana Boakye Dankwah Kokrodufuor - At Fawohoyeden (Asunafo)

Nana Boakye Dankwah Kokrodufuor gave a brief history of the town saying the indigenes of the town were Ashantis and that a very small number of them led by a heroic woman first migrated from Akropong. Apparently the first queen mother after travelling a long distance got to the river and decided to take rest. She was not sitting right or well so a member of the team she was travelling with asked her to sit upright and she said why should I sit upright and it became the name of the place and the river god. The town was therefore named Fawohoyeden”. All the lands that make up the town are under the custody of the Aduana clan of the Ashantis. About (85 to 90) % of inhabitants are cocoa farmers.

Settlements in the town of “Fa wohoyeyeden” begun from here and most of the people here were farmers and therefore upon seeing the vast land began to farm various crops till cocoa was introduced in the area. In seeking land for any agricultural purposes, permission and consent must be sought from the chief and his elders before land can be accessed. Cocoa is indeed a beneficial cash crop to the inhabitants of the town. For most households in the town cocoa is the main, if not the only, source of livelihood and therefore this crop is cherished by all. Although the population of the town has mainly been attracted to the area by cocoa farmers who are mainly migrants, today migration from elsewhere to farm in the area has reduced as a result of the difficulty of gaining access to land. Land has become scare with only government or state lands available. It was also realized that majority of the people who live here and farm cocoa are indigenes with a small number of migrants from several other parts of Ghana.

All land used for cocoa cultivation in the area is under customary land ownership, which is governed and controlled by the local town chief. He or his ancestors have granted land use rights to the extended families whose ancestors were part of the ancestry migration although the ultimate ownership rights were vested in the village chief as said earlier. Several forms of land tenure arrangements were identified. These include Abunu and Abusa sharecropping systems, freehold and leasehold, inheritance and outright purchase as well as gift lands. Comparatively, the Abusa (sharecropping) system of land tenure is the most prevalent in this community and the most secured between the two sharecropping systems prominent in the community is abusa. Family lands were said to be the least sought after because it is too fragmented and one is not likely to get a sizeable land for farming the crop. Again family lands are not transferable to children. It was realized that there were no serious challenges with any of the tenure systems except that the non-permanent systems faced the challenge of been taken away from the tenant farmer in cases where the tenant farmer becomes disrespectful or lazy and other signs that shows that he or she will not be able to work on the land. Direct purchase of land is not allowed except in rare cases when a land owners or his/her family is facing real financial challenge. Even in that case the land is only released for a period not more than 55 years which is renewable. Land could also be gifted out given certain conditionality, usually
upon one doing something extremely good like diligently serving the chief of the town and the community very well. These forms of Land tenure arrangements have continued for generations and have not yet changed by substance except the mechanisms in some cases.

There is no discrimination in respect of persons eligible to access land. Both youth and women are allowed freely to acquire land if only they are willing to put such lands to agricultural use. In the same way migrants and indigenes may have equal access to land especially owned by individuals and sometimes family lands. In the past when population was small and there were lots of virgin forests to be cleared, migrants were allowed to clear forests for cultivation, and the land shared in the abunu arrangement. This process resulted in the massive forest land loss through farming. Today it is very rare to have migrants coming in to clear forest land for farming since the land is just not there. Instead such migrants who are ready to farm can gain access to land through the elders and family heads.

On tree tenure it was clear that as it is now in Ghana, every tree (timber species) found in a cocoa farm belongs to the state and farmers are not allowed or will be prosecuted if found to have fell any tree in their farms. The Forestry commission is the state agent that supervises the felling down of the trees in such farms. Even though the farmers claim they do not benefit in any way from the felling down of such trees it was obvious that they were ready to plant the tree species provided by the UNDP and Cocoa life. This was also because the above mentioned organization has promised to assist farmers register the trees they are currently planting in their farmers so that they can own it themselves and enjoy the proceeds when it is matured and finally felled. So as it is now the farmers also iterated that none of the tenurial systems being practiced currently pose any challenge of limiting them from planting trees and observing other practices on the farm. What is important here is that the tenant farmer needs to inform the landlord in cases of any major decisions on the farm such as planting trees.

There is an anti-bushfire campaign team that is most active during the dry periods. Afforestation practices in the farmlands provide shading for cocoa, revenue from harvesting such trees, employment for the youth, enhancement of carbon sequestration and the provision of other by-products for carpentry and charcoal production. There are 41 associations of which the farmers of “Fawohoyeden” make up the Asunafo North Association. Farmers also lack the equipment and technology for cocoa processing though they cultivate vast farmlands.

Challenges to cocoa farmers include accelerating labor costs, expensive fertilizers, lower price quotes of cocoa beans by the government, bad silos and high replacement costs. Existent and active, but weak cooperative associations seem to be improperly represented for policy making concerning cocoa farmers.

9. **Interview with the Gyaasehene Nana Obeng Ackah - At Ayomso**

The town Ayomso, is named after river god. This is adjacent town to “Fawohoyeden”. At Ayomso, the Gyaasehene, Nana Obeng Ackah was the one we spoke to or granted us the interview since the main chief was not around. The Gyaasehene said the people of Ayomso first came from Antoa which falls within the Adonteng wing of the Ashanti Empire. The first
chief was Kwaku Gyan. The people of Ayomso belong to the Asene clan of the Ashantis. Nana Obeng Ackah made it known that the Akwaboahene was the custodian of all Tepa lands to which their lands belong. Settlements in Ayomso also started as a result of cocoa farming. Land in Ayomso is acquired by paying some token in the form of cash or drinks to the chief and his elders. The matrilineal system of inheritance is mostly practiced in Ayomso but the PNDC law 111 (The interstate succession law) is now being used since all available lands have been duly allocated to the various inhabitants.

The farmers confirmed the existence of Abunu, Abusa, gift, rental, purchase as well as “common property” systems of land tenure. The tenure processes with the highest security were gift, purchase and inheritance but purchase sometimes may be accompanied with forged documentation if the consent of the chief is not sought. All land in both towns is declared as stool land until a tenure arrangement is reached. Anyone interested in acquiring land can have access without any discrimination against gender, age or nativity.

An interesting sharecropping land tenure agreement that was noticed in Ayomso is “yemayenkye”. This land tenure practice can be likened to Abunu. With “yemayenkye”, the landlord provides the land and seedlings. The farmer or caretaker undertakes all other farm activities and the proceeds of the farm are shared 50:50 just like Abunu. After the first year of crop maturity of harvest, the farmer can move for permanent acquisition of his share of farmland but this cannot be realized unless a heavy payment is made to the Chief. At Ayomso, only building plots may be given out as gifts but land for cocoa farming would have to go through the “yemayenkye” system of land tenure.

General problems farmers in Ayomso face include government concessions with timber operators that result in the indiscriminate cutting down of trees which in turn destroy some cocoa trees. No prior information or notice is made available to the cocoa farmers before the felling of “economic trees” and neither is any permission sought from the chief before such government activities are undertaken. The indigenes of Ayomso do not in any way benefit from proceeds of such timber operating businesses. Farmers complain that their associations seem to have weaker representation in the committee of stakeholders, setup to agree on and take decisions with regards to cocoa farmlands. Harvest of cocoa in Ayomso has two major seasons which lasts for about three (3) months each. The farmers therefore crave for job opportunities in other fields outside their expertise such as vegetable farming, soap making and snail rearing. It is very difficult for a farmer in Ayomso to gain access to loanable funds since they are unable to pay back the loans. Bad roads have rendered some farmlands inaccessible. There is the problem of inadequate distribution and allocation of fertilizers and insecticides and the cost of acquiring such chemicals is high. There is also, discrimination in the distribution of farm accessories.

Nana Obeng Ackah concluded his speech by saying that the farmers need extensive as well as intensive education on the cocoa beans’ fermentation process. He also stressed on the fact that, if the cocoa farmers were to make the farming profession appealing and attractive through personality building, a greater number of youth would be involved in cocoa farming. Cocoa
farmers use proceeds from their cocoa farms for their children’s schooling fees, building, purchases and mortgage or as collateral for loans.

With regards to the challenges cocoa farmers’ face, the youth of Ayomso would be grateful if the government grants subsidies for easier acquisition of land for farming purposes. They would also want an extension of time of loanable facilities. Some other suggestions were that, a portion of government land be released to the youth without farmlands but it was generally argued that government land is unavailable due to unproductiveness. Ayomso cocoa farmers complained that they are discouraged from planting trees because trees are given to chainsaw operators regardless of its effects on the cocoa plantation. Population growth is one disturbing factor that has affected land tenure arrangements at Ayomso. All family lands have been farmed and any form of intrusion into the forest reserves would lead to the destruction of such farms.

10. Focus Group Discussion at Manso-Abore
At Manso – Abore a focus group discussion was held with cocoa farmers. In this village, all land was apportioned to family heads and hence, stool land was within the family of the chief. A commissioner of oath and a family head are responsible for the certification and sealing of all land documents. The dominant land tenure system is the “domayenkye” arrangement. The purchase of land in Manso – Abore is termed “trama”. A persons’ inability to will land to a successor would have their land returned to the family from which it was purchased. Hire purchase is an arrangement for growing annual and biennial crops but cocoa goes through the domayenkye system which is similar to the yem mayenkye in other places visited. It was made clear that the abunu in all the places visited is the same. Although the land is shared between the two parties theoretically, in practice it is the cocoa trees on the side of the tenant farmer which belongs to him/her and not the land per se. This explains why when there are no cocoa trees on the land, the land may have to revert back to the landlord or his/her family in case of family lands. It also explains why farmers will make sure that the cocoa trees on their portion of land is never completely cut down or destroyed. In actual fact what this suggests is that the farmer at all times will have to keep good agricultural practices to ensure that he/she never loses the trees on the farm but continue to have the cocoa tree on the farm. It means that cocoa plants with short life span will bring challenges to the farmers as opposed to those that are everlasting or long duration.

Land is also sometimes given out as gifts for a token. Common property is another tenure arrangement that is undertaken as the village undergoes development. Family lands are gradually being transferred to children and wives but with consent from family elders and heads. This also depends on the relationship that exists between family of the deceased and the wife of the deceased. In many cases the people of the town refer to this kind of land transfer as gifts from parents and not from the family even though the land actually belongs to the family. Many people here in the community believed that such lands cannot or never be taken away from them. They see such gift lands as their own property and are able to transfer to the private. This form of individualized land stems from the PNDC Intestate law 111 which allows land already cultivated by a diseased household to be divided into several portions. The divisions in
most cases is three-sixteenths to the surviving spouse, nine-sixteenths to the surviving children, one-eighth to the surviving parent, and one-eighth in accordance with customary inheritance law. In effects the law theoretically permits children and wives to the deceased to gain access to land that they would have been denied access to under traditional law.

The farmers of Manso – Abore expressed distaste for the uneconomical pricing of cocoa beans. They also complained of their misrepresentation on the board of price negotiators. They appealed for appropriate technology to process cocoa beans, without which they have little influence on cocoa pricing.

11. Interview with Frank Oppong – CHED, Wassa East
The Cocoa Health and Extension Division (CHED) has been promoting environmental sustainable practices such as safer (i) concentration level for spraying - safer use of agro-chemicals, (ii) tree planting or planting of economic trees including Odum, Ofram and Mahogany (iv) soil improving and conservation measures such as mulching and creation of buffer zones along waterways in farms and (v) General farm maintenance such as pruning and weeding. The observation in the area is that it is easy for the landowners to decide on land investments than those with tenancy arrangement. With the re-planting exercise being conducting in all the major cocoa growing areas in Ghana, about 1111 trees attract GHC1850 – Initial Treatment fee of 30% and After Replanting fee of 70%. The Cocoa Health Extension Division gives free economic trees, fertilizer and other agrochemicals.

Migrant farmers constitute about 60% and Natives 40%. For family lands you need to approach the head of the family. For inherited lands one need to slaughter a sheep as a form of thanksgiving. When cocoa trees are felled the land goes back to the owners and so it becomes difficult to convince tenant farmers to adopt such practices. Most cocoa trees are becoming unproductive and need to be replanted.

12. Jacob Worgbeyie – Stool Lands Administration, Wassa East
There about 12 stool lands registered with the Wassa East District Assembly. The stool lands administrator collects GH10/acre/Annum from farmers cultivating on stool lands. Some proportion is paid to the District Assembly. Generally, land is not for outright sales. The Chief leases land for a maximum of 50 years. Leased lands attract a fee of GHC100/Acre with some drinks. Several land tenure arrangement exist in the area but sharecropping- Abusa is common for new lands or planting of cocoa trees by the tenants themselves. The Tenants take two thirds while the land owners take a third. There is limited land for cocoa expansion. Land access for cocoa farming, there is the need to conduct the necessary investigations to ascertain the true ownership of lands especially family lands.

13. Interview with Nana Kwaw Piabo, Adviser to the Daboase Chief
Nana Kwaw Piabo is the Adviser to the Chief but currently acting since there no paramount chief of Daboase. There are several types of land including stool lands, family lands, Individual lands and State Lands (for Rubber Plantation). According Nana, majority of the lands for cocoa
farming are family lands. He confirmed that a lot of cocoa farmers are converting their farms into rubber due to unattractive price for cocoa and also majority of these lands are no longer fertile for cocoa farming. For him conversion of cocoa farms into rubber plantations is a better option for infertile cocoa lands. The SACFINAT offer more attractive packages — They have bought about 17500ha land from the chiefs. In addition to competition created by the Rubber Company, Small Scale Mining (galamsey operators) is taking over the lands. There is gender perspective to land acquisition in the area, most females have to access land through their spouse except for those who have inherited from their parents. Land use changes are very limited until recently when conversion of cocoa into rubber became intense. Currently, access to land for cocoa farming is not easy at all.

Land tenure arrangement on cocoa farms has an influence on the adoption of environmentally sustainable practices. For example landowners need to be consulted for land investment such as tree planting. In addition to the land tenure type, the social relation of the land owner in question is a key influencing factor with respect to uptake of sustainable cocoa production practices. The age of the landowner and the possibility of enjoying some of the benefits accruing from tree planting are also important. Main challenges include limited land for cocoa expansion and Land disputes especially among family lands without proper documentation. Family lands are less secured as compared to registered stool lands.

Challenges

- Conversion of cocoa farms into rubber plantations. This is a better option for infertile cocoa lands. The SACFINAT offer more attractive packages — They have bought about 17500ha land from the chiefs
- Competition by the Rubber Company in the area
- Calamsey operators/operations of small scale miners
- Gender issues; most females have to access land through their spouse except for those who have inherited from their parents
- Limited land for cocoa expansion
- Land disputes especially among family lands without proper documentation

14. Group Discussion at Kwabaa – Wassa East District

The group composition was made of 26 members including 10 women. All the lands used for cocoa farming in the area are stool lands. According to the group, stool lands are more secured than family lands which could have unclear ownership with land being passed on from one generation to another.

To acquire land for cocoa farming, first you contact the chief and then with the help of elders identify the rightful land owner for agreement. Initially verbal agreement in the presence of a witness is done until the fructifying stage when documentation is signed under oath. Drinks or GHC25 and commitment fee of GHC300/acre is paid. Primarily, Abusa sharecropping is
practiced when cultivating forest lands – that is the tenant plants the cocoa trees. Here the land owner takes a third of the produce. For caretakers on already established cocoa farms, a third is taken while the owner takes two thirds. Abunu is practiced when cocoa is cultivated by the tenant on farm lands. The owner and the tenants share proceeds equally. Ideally, land reverts back to the owner when the cocoa trees are felled or replanting decision need to be taken. However, land investment with long-term gains decisions on cocoa farms is purely subjective to the owner’s social relation and discretion. Most times the age of the land owner and financial standing influence such decisions.

For cocoa farming, land rental is not common but only practiced when urgent need for cash situation arises. Cash needs for paying of school fees is an issue and farmers were of the view that time of cocoa purchases and payments should coincide with the school re-opening. Land is usually rented out for food crops farming. It was noticed from the group discussion that women usually support their husbands and in principle do not access land except through men if not inherited land. Natives have easy access to land than the migrant farmers.

15. Group Discussion at Sekyere Heman in the Wassa East District

This group had a membership of 20 with 8 women. There are several types of land including stool lands, family lands, and Individual/Private lands. For the individual/private lands, tenants pay a commitment fee of GHC 200/acre and some drinks. Abunu Sharecropping is mainly practiced for cocoa farming while Abusa is used for food crops cultivation. There were no outright sales of land. Stool lands are leased. Inherited lands accounted for 60% and farmers intimated that inherited lands with proper documentation are more secured. Government Lands are leased to companies like (SIPL/SOCFINAF Lands/GREL) for 99 years.

The changes observed in the land tenurial arrangement involves proper documentation of land agreements which used to be verbal in the presence of a witness. Again formerly abusa sharecropping system was practiced on forest/virgin lands with the tenants taking two thirds of the proceeds. Currently, there are no forest lands and abunu is commonly practiced when a tenant establishes cocoa plantation on farm lands.

Although the existing land tenurial arrangement for cocoa farming does not discriminate against social groups including youth, women, natives and migrants, few women had lands through inheritance. Culturally, women and their children support their husbands/fathers to
It was observed that invariably land ownership arrangements influence farmer decision to adopt environmental sustainable practices especially replanting of cocoa trees and tree planting within farms to improve shade. Such land investment decisions have to be taken with landowners. Most farmers in the cooperatives were of the view that landowners only agree on investing in land improvement measures that are beneficial to them. Cocoa farmers in the cooperatives easily adopted sustainable practices extended for fair trade certification except for creation of buffer zones as a result of already fragmented and small farm sizes.

Main challenge mentioned by farmers had to do with low cocoa buying price which had remained the same over the last 3 years at the time of the survey. Access to land for cocoa farming had become difficult due to limited land, increased population of migrants and land sales to the Rubber Plantation Company. Disputes on family lands were resolved by the traditional authorities. Cocoa farmers needed more education on land registration and documentation to avoid disputes.

16. Group Discussion at Ewiadaso in the Wassa East District
The group composition was made up of 10 males and 4 females. Land used for cocoa farming was mainly stool lands (70%) and individual lands (30%). The farmers confirmed that individual lands are not very secured as compared to the stool lands. Farmers here were not members of the cooperative. Revenue paid on stool lands was GHC10/acre. No other commitment fees were paid to the chiefs. Farmers only have to contact the chief for renewal of land agreement if other crops are to be cultivated. Land for cocoa farming was exhausted in Ewiadaso. Again, women have to assist their husbands on the cocoa farms. Those women who have access to land inherited from their parents. The farmers here did not have good records on cocoa outputs or sales.
Appendix 1 Interview Guide

Date:
Region/Community:
Group Membership:
Group Composition:

Land tenure and its practical implications for the cocoa sector

1. What is the existing process and procedure for securing land for farming especially cocoa farming in the community?

2. What are the challenges associated with each of the following tenurial systems from the perspectives of both land owners and tenants;
   - share cropping (including abunu(1:2) and abusa (1:3);
   - rental;
   - outright purchase;
   - gifts;
   - inheritance;
   - common property

3. Which of the above land tenural regime would you describe as the most Tenure Secured and why?

4. Which tenurial arrangement is most suitable for cocoa farmers and why?

5. Why are the other systems of tenure arrangements not favoured by the farmers?

6. How do the current tenurial arrangements affect youth, women, natives and migrants and what are the conditions under which each of the social groups above gain access to land for cocoa farming?

7. Who among the social groups identified is permitted/ allowed to plant trees on their farms and why?

8. What are the economic, environmental and social/cultural factors affecting/influencing expansion of cocoa farms?

Influence of land tenure regimes on environmental sustainability
9. What are stakeholder perceptions of Tenure Security in this community?

10. Describe the following farmland ownership categories in the community
    - Family land
    - Individual land (also inherited and personally owned)
    - Sharecropping (Abusa and Abunu)
    - Caretaker farmers
    - Stool lands
    - Farmers using outright purchase land

11. How does the current land ownership arrangements influence farmer decision to adopt environmental sustainable practices on the farm including:
    - Tree planting within farms to improve shade
    - Soil-improving and conservation measures
    - Soil erosion control on farms; safe use of agrochemicals; pollution of water bodies with either inorganic fertilizers or agrochemicals; creation of buffer zones along waterways in farms; unnecessary killing of trees on farms; hunting even in the off-season; use of total weed killers and other unapproved chemicals; burning & bush fires; etc

**Welfare and income impacts of existing land tenure regimes in the cocoa belt**

12. Describe the impacts of existing land tenure regimes on community welfare, incomes and farmers' ability to adopt practices that involve long term gain.

13. What are the benefit sharing arrangements practiced in this community

14. How will these benefit sharing arrangement inform recommendations of land tenure models

**Proposal for improvements in land tenure regime to enhance sustainable cocoa production**

15. What are the key constraints, gaps or obstacles to achieving sustainable cocoa production and benefit sharing regimes,

16. Suggest concrete recommendations for addressing these challenges.
Appendix 2 Survey Questionnaire

Land tenure arrangements in Cocoa growing areas and their implications for Ghana’s Cocoa Sector

Questionnaire No:............................ Date: .....................

A. Land holding and acquisition

1. How many different plots of cocoa farms do you have in this community? ...............  

2. From whom did you acquire the lands on which you currently farm?  
   a. self-owned   b. community   c. family   d. individual   e. state f. others

3. How did you acquire the land you currently cultivate? (tick as many as are applicable )  
   a. inheritance  b. sharecropping  d. rental e. gift/donation  f. outright purchase  g. Others .........

4. If sharecropping, what is the proportion?  
   a. Abunu   b. abusa   c. Other (specify).............................................

5. What are the benefits you derive from the different types of tenure arrangements  

What are some of the things you would like to be changed in the tenure arrangements on your cocoa farm?  
...........................................................................................................................................  
...........................................................................................................................................

6. How would you describe the cost of renting land for agriculture in this community?  
   a. expensive   b. affordable   c. manageable/ok   d. others .................

7. List some of the major difficulties you usually face with the access to land for cocoa in this community?  
...........................................................................................................................................

8. Please provide the following details about your farms?  

<table>
<thead>
<tr>
<th>Plot/Cocoa farm No.</th>
<th>Year of acquisition</th>
<th>Size of cocoa farm (acres)</th>
<th>Right to land</th>
<th>Means of acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non = 0</td>
<td>Inheritance=1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dispositional=1 Use =2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Both (1 &amp; 2)=3</td>
<td>Tenancy=2 Gifts =3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Purchase =4</td>
</tr>
</tbody>
</table>

1
15. In your own view how would you describe the ease of gaining access to land in this community?
   a) very easy  b) easy  c) not easy  d) Not easy at all  e) I don’t know

B. Type of land rights and security of tenure

1. Is your right over land renewable?  
   a. Yes  b. No

2. Under what conditions will your contract/rights to the land be revoked?

3. What obligation do you have towards the owner of the land you cultivate
   ………………………………………………………………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………………………………………………………………….

C. Communal/ Family land

1. Do your family/clan own land in this community?  
   a. Yes  b. No

2. Do your family/clan own land in this community?  
   a. Yes  b. No

3. Did you in the past 10 years cultivate any portion of your family’s land?  
   a. Yes  b. No

4. Do you currently farm any portion of your family’s land?  
   a. Yes  b. No

5. Do you face any restrictions with the use of the family land?  
   a. Yes  b. No

6. Please mention those restrictions, if there are any
   ………………………………………………………………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………………………………………………………………….

7. Please explain why you do/did not farm any portion of your family land?

D. Changing dynamics of land acquisition

1. What kind of changes do you see going on, in relations to land acquisition and tenure arrangements, if there is any? ……………………………………………………………………………………………

2. What factors could be responsible for these changes in this community?
   a. monetization of rules  b. population increase  c. increased comm. Agriculture  d. land sales
E. Sustainable Cocoa Production Practices

1. Please indicate the type of sustainable production practices carried out on your cocoa farm (Tick Y=yes ; N=No)

<table>
<thead>
<tr>
<th>Sustainable agricultural practice</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replanting trees infected with cocoa swollen shoot virus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil-improving and conservation measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree planting within the farms for canopy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land improvement and conservation measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preservation of indigenous trees/maintain forest trees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservation of natural forest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishment of forest plantations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest buffer zones and corridors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mulching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Best Agronomic practices (State)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Which of the practices listed above is most common in this community and why?
-------------------------------------------------------------------------------------------------------------------

4. Which of the practices is much difficult to adopt and why?
-------------------------------------------------------------------------------------------------------------------

5. Can land tenure arrangement on cocoa farms influence farmers’ uptake of environmental practices?
   a. Yes...... b. No........

6. If Yes please explain
   ..............................................................................................................................

7. How can access to agricultural (cocoa) land be made easier or farmers?
   ..............................................................................................................................
Please provide the following information to help complete the table below

<table>
<thead>
<tr>
<th>Year</th>
<th>Land Tenure</th>
<th>Sustainable practices</th>
<th>Farm size (acres)</th>
<th>Yield (Cocoa Output per acre - bag/acre) bag=64kg</th>
<th>Total Output (bags)</th>
<th>Price per bag</th>
<th>Total Income (GHC)</th>
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<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
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<td></td>
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<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Personal Data:**

1. Name of respondent: Tel Gender a. male b. female
2. What is your residential status in this community? a. native b. settler c. others
3. What is your highest level of educational? a. None b. Basic (Primary/JHS), c. Secondary (SHS, Tech/Voc) d. Tertiary e. Others (Specify)
4. What is your age (in years)? a. below 18yrs b. 18-35yrs c. 35-60yrs c. above 60yrs
### Appendix 3. Results of the Multivariate Probit Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tree planting within farms</th>
<th>Replanting diseased and aged trees</th>
<th>Safe use of agrochemicals</th>
<th>Prevention of Bush and Wild fires</th>
<th>Prevention of killing/felling of trees</th>
<th>Soil improving and conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>z</td>
<td>Coeff</td>
<td>z</td>
<td>Coeff</td>
<td>z</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.442</td>
<td>5.264</td>
<td>0.675</td>
<td>2.903</td>
<td>0.335</td>
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<tr>
<td>Farm size</td>
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<td>0.512</td>
<td>0.008</td>
<td>1.171</td>
<td>-0.009</td>
<td>0.712</td>
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<td>Tree age</td>
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<td>0.287</td>
<td>0.000</td>
<td>1.674</td>
<td>0.000</td>
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<td>Age</td>
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<td>0.898</td>
<td>0.004</td>
<td>2.048</td>
<td>0.005</td>
<td>1.404</td>
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<td>0.142</td>
<td>0.832</td>
<td>0.364</td>
<td>1.136</td>
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<tr>
<td>Residential status</td>
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<td>1.839</td>
<td>0.092</td>
<td>-1.331</td>
<td>-0.084</td>
<td>0.649</td>
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<tr>
<td>Gender</td>
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<td>0.154</td>
<td>0.019</td>
<td>0.368</td>
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<td>0.703</td>
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<tr>
<td>Education</td>
<td>0.052</td>
<td>3.006</td>
<td>0.012</td>
<td>-0.858</td>
<td>-0.042</td>
<td>1.549</td>
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<tr>
<td>Tenure system</td>
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<td>1.444</td>
<td>0.141</td>
<td>2.641</td>
<td>0.261</td>
<td>2.606</td>
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<tr>
<td>Eastern regional effect</td>
<td>0.135</td>
<td>1.287</td>
<td>0.078</td>
<td>-0.877</td>
<td>0.294</td>
<td>1.762</td>
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<tr>
<td>Ashanti regional effect</td>
<td>0.189</td>
<td>1.826</td>
<td>0.892</td>
<td>10.135</td>
<td>-0.017</td>
<td>0.101</td>
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<td>Brong Ahafo regional effect</td>
<td>0.156</td>
<td>1.437</td>
<td>0.890</td>
<td>-9.639</td>
<td>0.239</td>
<td>1.381</td>
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---

### Model statistics

- Sample size: 231
- Log-likelihood stat: -135.710
- Wald $\chi^2$ = 39.49
- Prob $>$ $\chi^2$ = 0.00025

---

### Appendix 4. Stakeholders Interacted with

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation/Institution</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacob Worgbeyie</td>
<td>Stool Lands, Wassa East</td>
<td>0272886752, 0247976800</td>
</tr>
<tr>
<td>Frank Oppong</td>
<td>Senior Technical Assistant, Cocoa Health Extension Division (CHED), Wassa East</td>
<td>0244116629, 0205405059</td>
</tr>
<tr>
<td>Nana Kwaw Piabo</td>
<td>Adviser to the Chief, (Currently there is no chief), Wassa East</td>
<td>0202992376</td>
</tr>
<tr>
<td>Nana Ama Animah II</td>
<td>Queen Mother Daboase, Wassa East</td>
<td></td>
</tr>
<tr>
<td>Nana Opoko</td>
<td>Traditional Leader of Akyem Abuakwa, Bosuso in the Eastern Region</td>
<td></td>
</tr>
<tr>
<td>Francis Aneani</td>
<td>Socio-Economist CRIG, Tafo in the Eastern Region</td>
<td>0244763516</td>
</tr>
<tr>
<td>Name</td>
<td>Position/Title</td>
<td>Contact</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Humphry Ayisi</td>
<td>Fanteakwa Cooperative Union President</td>
<td>0247691293</td>
</tr>
<tr>
<td>Osaberima Awuah Kotoko II</td>
<td>Begrohene</td>
<td>0244232575</td>
</tr>
<tr>
<td>Augustus K. Mireku</td>
<td>In charge of stool lands Fanteakwa District Assembly</td>
<td>024564000</td>
</tr>
<tr>
<td>Owusu Yeboah</td>
<td>Deputy District Cocoa Officer, CHED-Tafo</td>
<td>0244-816731</td>
</tr>
<tr>
<td>Nana Opia Mensah</td>
<td>Chief</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manso Mem</td>
<td></td>
</tr>
<tr>
<td>Nana Boakye Dankwah Kokrodufuor</td>
<td>Chief</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fawohoyeden</td>
<td></td>
</tr>
<tr>
<td>Nana Obeng Ackah</td>
<td>Gyaasehene</td>
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