Rufford Small Grant

(for Nature Conservation)

PROJECT REPORT

PROJECT

Participatory assessment of crop-raiding by wildlife in the Afadjato-Agumatsa Conservation Area (Ghana) to conserve nature.

By: **Edem Ekpe**

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EXECUTIVE SUMMARY

Crop-destruction by wildlife discourages local people from supporting conservation efforts and is a potential cause of farmer-forest manager conflict in the Afadjato-Agumatsa Conservation Area of Ghana. This project aimed at assessing the crop-raiding situation in the area.

The project was undertaken from April 2006 to July 2007. Participatory methods were used for this research work. Farm-raiding rates, crop-destruction levels and influencing factors were also assessed. Thirty-seven farmers were actively involved in the project on small farms of size ranging from half to seven acres. Total farm area surveyed was 105.2 acres. Eleven different crops were raided by nine wildlife species and groups. The crops included both annual crops and perennial cash crops. The most raided crop was cassava (*Manihot esculenta)* and the most active crop-raiding wildlife was the grasscutter (*Thryonomis swinderianus)*. Farmer interest and participation in the project was high. However, there were indications that this was being driven by thoughts of financial compensation. Squirrels and grasscutter raided the highest number of crops. This indicates the important role of such small and uncharismatic species and so the need to direct crop-raiding mitigating efforts to such species. This could be applicable in forest conservation areas where there is increasing fragmentation and many farms border the reserves.

The project had other benefits for the Afadjato Conservation Area and the wider conservation world. These included training of local forest guards in farm surveys and training of university students in using GPS. Also the maps produced has been useful for the Afadjato Project in field work planning. At the time of submitting this report, a poster presentation on the results of the most active crop-raiding wildlife in the area has been accepted for the Working Forests in the Tropics Conference: *Partnering Research with Practice for Conservation and Development* to be held at the University of Florida, Gainesville, USA in October 2009.

It is recommended that further data be collected to compare to the baseline data for further research. Also the use of chilli pepper and animal dropping solutions on crops to deter animals could also be experimented. Gender issues with respect to the effect of crop-raiding could also be investigated.

Summary of Financial Report

Four thousand nine hundred and twenty-two pounds fifty pence **(£4,922.50)** was spent from the budget of four thousand nine hundred and thirty pounds **(£4,930)**. This left a balance of seven pounds fifty pence **(£7.50).**

ACKNOWLEDGEMENTS

I am very grateful to The Rufford Small Grants Foundation for funding this work. Many thanks to the the Gbledi and Fodome-Ahor communities especially the farmers near the community nature reserve in Gbledi-Gbogame, Fodome-Ahor, Torglo and Agumatsa who assisted this work with their time, energy and rich local knowledge. To the Afadjato Project's staff, especially the community forest guards, I thank you for your hard work during the field work and for being instrumental in assisting during data collection and community meetings during this work. My thanks go to Mr. Reuben Ottou who helped to organize most of the field work and the community meetings during the project. Thanks also to Dr Erasmus Owusu, Dr. Paulinus Ngeh and Mr. Isaac Olesu-Adjei for their timely technical advice for the successful design and implementation of this project. Many others who contributed to this but whose names have not been mentioned here, thanks to you all.

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INTRODUCTION

Crop-raiding by wildlife is a major cause of human-wildlife conflicts, which needs careful attention especially in rural Africa. This is especially important in areas where there are a lot of farms bordering conservation areas. Crop-raiding therefore affects both biodiversity and the socio-economic activities of communities that live near conservation areas. This issue is therefore of high importance in the Afadjato-Agumatsa Conservation Area in Ghana. The project area is a community nature reserve established by the Gbledi and Fodome-Ahor communities in partnership with the Ghana Wildlife Society in the Hohoe District, Volta Region of Ghana. The site is one of the globally Important Bird Areas in Ghana as denoted by BirdLife International and forms part of the ranges constituting the remaining afro-montane and Upper Guinea forests, a biodiversity hotspot.

Since the establishment of the community nature reserve, wild animals from the reserve raid farms and destroy crops and so drawing complaints from local farmers. Since farming is the major occupation, this adversely affected livelihoods of the communities and had the potential to reduce local participation in conservation and result in farmer-forest manager conflicts. This project therefore used participatory processes to assess crop-destruction by wildlife and influencing factors. The results of this project were expected to be useful for forestalling any such human-wildlife conflicts and encourage local support for conservation. The project was undertaken from April 2006 to July 2007. The team was led by Edem Ekpe, a conservation biologist with Ghana Wildlife Society and currently a graduate student at the University of Central Florida.

The specific objectives of the project were;

- To document crop-raiding by wildlife in the Afadjato Conservation Area.
- Actively involve farmers in assessing the crop-raiding situation in the area.
- Develop local capacity and improve public awareness on the issue of crop-raiding by wildlife, thereby increasing local participation in biodiversity conservation and preventing farmer-forest manager conflicts in the area.

This report outlines the project planning process the activities and achievements, some research outcomes as well as the lessons learnt.

PROJECT ACTIVITIES

Planning and field reconnaissance

After an initial reconnaissance in the field and community interactions, it was decided to divide the area into Gbledi, Fodome Ahor and Agumatsa and Torglo. This was changed after further community interactions. The project area was finally divided geographically into Gbledi, Fodome-Ahor, Agumatsa and Torglo. A total of thirty-seven farms were selected to be surveyed during the period. For purposes of reference for future studies, the names and sizes of the farms have been listed in the Appendix 1. Collection and analysis of data was based on these sites.


Figure 1: Pictures of the Principal Investigator working in the field

Mapping of farms

Mapping of the conservation area involved using a Global Positioning System (GPS) to locate the farms and then using the GPS positions obtained and a Geographical Information System (GIS) from the Centre for Remote Sensing and Geographic Information (CERSGIS) of the University of Ghana to produce a map. The map outlines the location of the conservation area as well as the specific locations of the farms monitored during the project relative to the conservation area. A total farm area of 105.2 acres was surveyed during the project. This was made up of 24.5 acres in Gbledi Gbogame, 30 acres in Fodome Ahor, 24.7 acres in Agumatsa and 26 acres at Torglo (See Appendix 1 for details). During this process, community forest guards and two students from the Faculty of Renewable Natural Resources, Kwame Nkrumah University of Science and Technology were trained in using the GPS in the field. The map was also used during community meetings to help farmers appreciate the location of their farms in relation to the Community Nature Reserve. A copy of the map is shown in Appendix 2.

Data collection on farms

In consultation with the field staff, a data sheet for collection of data was done. A sample data sheet is in Appendix 3. Community forest guards were then trained to collect accurate data in the field. Data collected included farmer's name, estimated area of farm, crops on farm, GPS position, the distance from boundary of reserve, landowner, crops raided, and animal responsible. Selected farms of thirty-seven farmers were surveyed and mapped during the project to establish baseline data on farm-raiding by wild animals in the project area.

Raided crops

A total of eleven crops were recorded to have been raided during the project period. These include cassava, plantain, banana, cocoyam, corn, oil palm, coffee, avocado pear, cocoa, cowpeas and yam. Nine crops were raided at Gbledi, six at Fodome Ahor, nine at Torglo and five at Agumatsa. Total frequency of crops raided was 97. Five crops namely cassava, banana, corn, and oil palm were raided in all study sites (Table 1).

Table 1: Frequency of crop raiding at the four study sites

Common name of crops	**Scientific name of crop**	**Frequency of crops raided at study sites**				**Total Frq.**
		Gbledi	**Ahor**	**Torglo**	**Agumatsa**	
Cassava	*Manihot esculenta*	5	3	3	10	**21**
Plantain	*Musa spp.*	3				**3**
Banana	*Musa spp.*	3	3	2	4	**12**
Cocoyam	*Xanthosoma spp.*	3	4	3		**10**
Corn/Maize	*Zea mays*	7	6	2	7	**22**
Oil palm	*Elaeis guinensis*	4	1	1	3	**9**
Coffee	*Coffea robusta*			1	1	**2**
Avocado Pear	*Persea americana*	1		1		**2**
Cocoa	*Theobroma cacao*	8	5	1		**14**
Beans/Cowpeas	*Vigna unguiculata*			1		**1**
Yam	*Disocorea spp.*	1				**1**
	Total	**35**	**22**	**15**	**25**	**97**

The most highly raided crop was corn and cassava with a frequency of 22 and 21 respectively and the least were cowpeas and yam, each with a frequency of one (Figure 2).

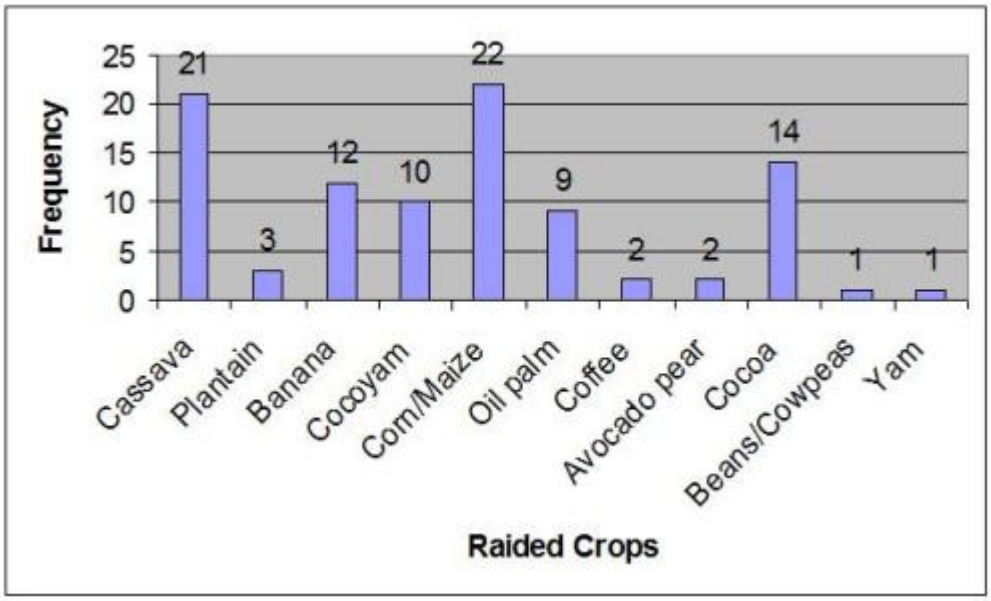


Figure 2: Frequency of raids on crops

Comparing the four study sites, Gbledi recorded the highest crop-raiding frequency of 35 followed by Agumatsa, Fodome-Ahor and Torglo with crop-raiding frequencies of 25, 22 and 15 respectively (Figure 3).

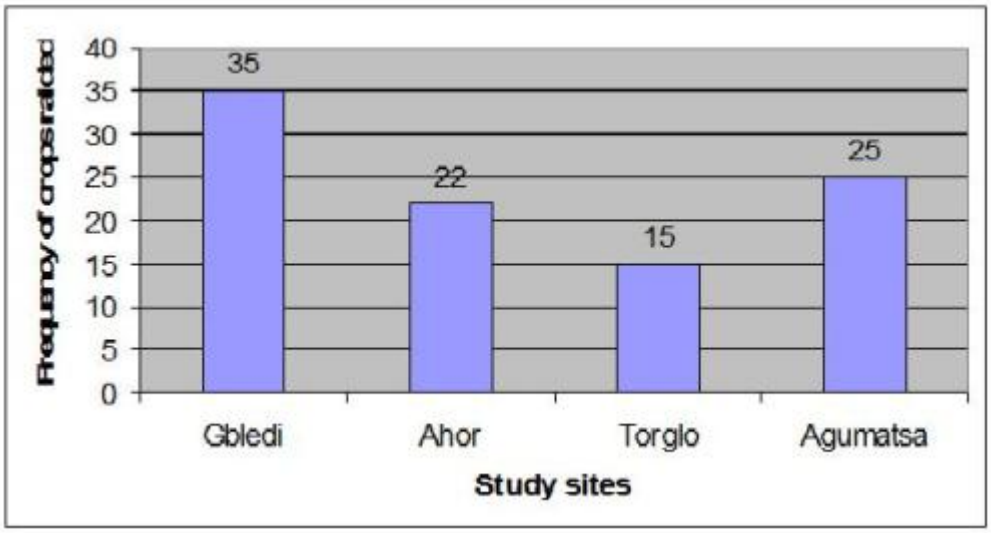


Figure 3: Frequency crop raids at study sites

Crop-raiding animals

A total on nine animal species and other taxa or groups were recorded to be responsible for the crop-raiding during the project period. These include squirrels, grasscutter/cane rat, Ahanta francolins, other birds, monkeys, civet cat, duikers, bushbucks and African giant pouched rat. All these animals could not be identified to the species level because, the crop-raids were not observed live. Rather the remains of raided crops were used during the project. As a result, these were based on pre-knowledge of the principal investigator, his field assistants and the farmers about feeding remains of animals.

A total of 79 animal raids were recorded during the period. Crop-raiding by three of the animals namely squirrels, grasscutter and primates were recorded in all study sites. The other animals were not recorded at all the study sites (Table 2). Also the frequency of animal raids at the sites ranged from 18 to 22, which were not significantly different.

Table 2: Frequency of raids by crop-raiding animals

Common name of animals	**Scientific name of animals**	**Frequency of animal raids at study sites**				**Total**
		Gbledi	**Ahor**	**Torglo**	**Agumatsa**	
Squirrels	*Xerus spp.*	8	6	4	1	**19**
Grasscutter	*Thryonomys swinderianus*	4	7	4	12	**27**
Ahanta Francolin	*Francolinus ahantensis*	2	1	4		**7**
Other birds	*Aves*	1				**1**
Monkeys (Mona and spot-nosed monkeys)	*Cercopithecus spp.*	3	4	4	2	**13**
Civet cat	*Civettictis civetta*	1				**1**
Duikers	*Cephalophus spp.*		3	1	2	**6**
Bushbucks	*Tragelaphus scriptus*		1			**1**
Pouched rat	*Cricetomys gambianus*			3	1	**4**
	Total	**19**	**22**	**20**	**18**	**79**

Grasscutter (*Thryonomys swinderianus*) was the most active crop-raiding animal recording frequency of 27 followed by 19 and then by the *Cercopithecus* monkeys. Other birds, civet cat and bushbuck recorded the lowest raiding frequencies of one each.

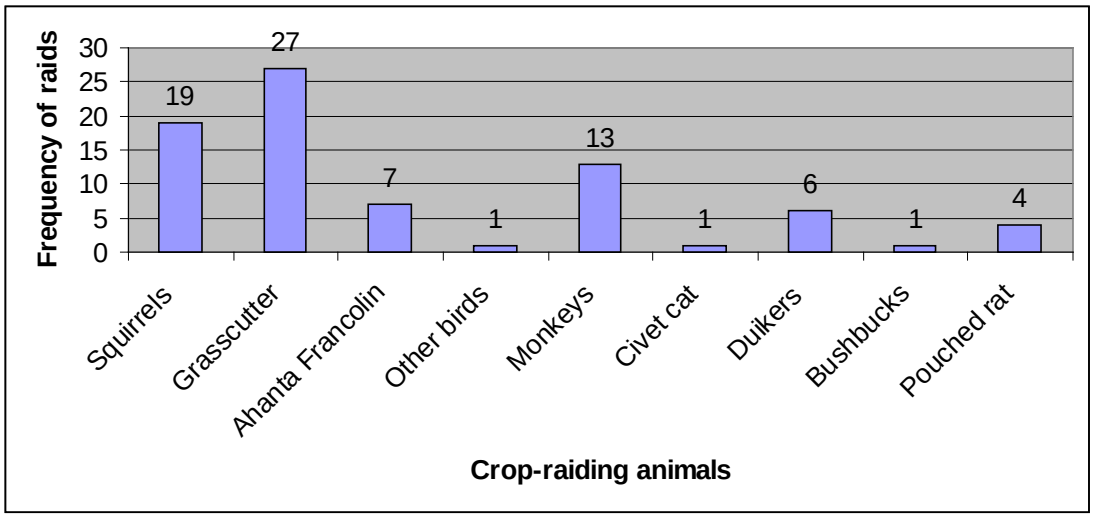


Figure 4: Frequency of raids by wildlife

Animal-crop interactions

The data collected also provided information to examine the animal-crop interaction with respect to crop raiding. Table 3 below outline the animals and the crops they were recorded to have raided. Squirrels, pouched rat, grasscutter and monkeys raided the largest numbers of crops.

Table 3: Animals and the crops they raided

#	Animal	Crops
1	Squirrels	Cocoa, plantain, oil palm, corn, cassava, banana, cocoyam
2	Grasscutter	Cassava, corn, oil palm, coffee
3	Francolin	Cocoyam, beans/cowpeas
4	Other Birds	Oil palm
5	Monkeys	Cocoa, banana, oil palm, plantain
6	Civet cat	Cocoa
7	Duikers	Cocoyam, banana (stored), cassava
8	Bushbuck	Cocoyam
9	Pouched rat	Coffee, beans/cowpeas, avocado (stored), maize, cassava

Community meetings and focus group discussions

These meetings were initially used to identify and engage key farmers affected by wildlife farm-raiding as well as to gather information from other stakeholders in the process. Later they

became forums for discussing farmers' experiences with crop-raiding. From these meetings the sample of farmers who were willing to work with the project was compiled. They also helped to bring out the main concerns of farmers. Also some raided crops, locations of farms and other influencing factors were estimated using these methods.

The meetings were also used for capacity building and public education on the issue of crop-raiding in the area. The maps produced were discussed with the farmers to locate their farms in relation to the conservation area. This helped them to appreciate the issue better. Other documentations used included the results of the research. An example was that it was noted that the non-charismatic wildlife species were more responsible for crop-raiding than what most tourists would like to see.

Edem discussing a map with some farmers *Edem taking notes while a farmer raises his concerns*

Figure 5: The Principal Investigator during a community meeting

LESSONS LEARNT AND FURTHER RESEARCH

Results of this project indicate that the issue crop-raiding of high interest to the farmers in the project area. Informal discussions with some of the farmers indicate an interest in compensation payments. This may not be sustainable. Therefore, it is advised that further work be done to vary the crops. Also, some suggestions of using natural chemicals (use of solutions of local chilli or animal droppings) to reduce crop-raiding be experimented in the area.

The crops raided included both annual crops and perennial cash crops. This implies that those affected include all types of farmers. It was however noted that because of the social system in the project area, gender participation was much skewed towards males. Farms are usually owned by family heads who are normally males. Female farm ownership in the community is very low.

The most active crop-raiding animals were the small non-charismatic wildlife species. This is important in view of the fact that many forest areas are being fragmented and thereby resulting in the increase in the population of such species. This therefore proposes that much attention must be given to these species in crop-raiding issues elsewhere in the world.

With this good baseline data collected, this process would need to be continued. Further research is therefore recommended to help address the crop-raiding issue in the Afadjato-Agumatsa area.

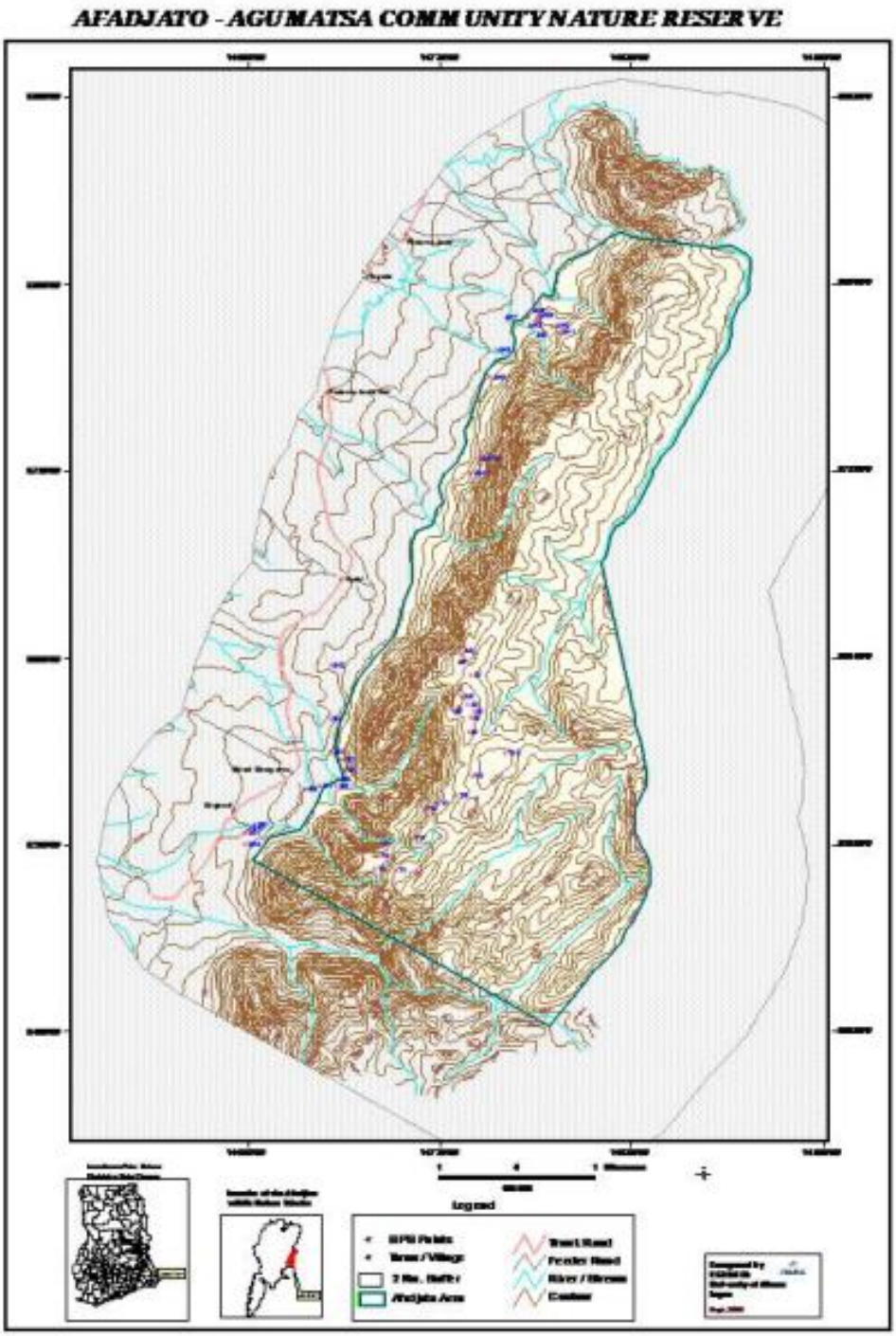
APPENDICES

Appendix 1: Farmers sampled during project

#	Farmer	Size of farm in acres
Gbledi Gbogame		
1	William Kakraba	3
2	Albert Agama	2.5
3	Michael Homatekpor	4
4	Eusebius Zonyra	2.5
5	Isaac Noagbewornu	1.5
6	T.C. Donkor	3.5
7	Kudjo Sogadzi	2
8	Philip Agbolosu	1
9	Lucas Sapaty	0.5
10	Akroa	0.5
11	Ezu Koku	1.5
12	Paul Tordidza	2
	Total area	**24.5**
Fodome Ahor		
1	Emmanuel Gabla	5
2	Esi	2
3	Cosmos Nte	4
4	Joseph Nte	1
5	Michael Adorboe	1
6	Bilende	4
7	Henry Akpatsa	3
8	Francis Adorboe	5
9	Dornu Koku	3
10	James Kra	2
	Total area	**30**

#	Farmer	Size of farm in acres
	Agumatsa	
1	Abu Kadogoli	4
2	Alpha	2.5
3	Kokroko Yao	7
4	Agortse Wotaklasu	6
5	Maman	1
6	Antoine Lamber	2.5
7	Senazi Wotaklasu	1.7
	Total area	24.7
	Torglo	
1	Remi Kilim	5
2	Anukware Kossi	2
3	Kiki Afedo	1.5
4	Tsikri Kable	4
5	Leglo	5.5
6	Albert Kable	2.5
7	Tawlisi Kable	3.5
8	Peter Gezele	2
	Total area	26

Appendix 2: Map of area



Appendix 3. Sample of data sheet

Participatory Assessment of Crop-raiding in Afadjato-Agumatsa Conservation Area
Survey of Boundary Farms

#	Farmer	Estimated Area	Crops	GPS Position	Dist. From Boundary	Landowner	Crops raided?	If yes, ……..			
							Yes/No	Month	Crop	Animal	Remarks

Appendix 4: Financial Report

Project Title: Participatory assessment of crop-raiding by wildlife in the Afadjato-Agumatsa Conservation Area (Ghana) to conserve nature.				
BUDGET LINES	**Amount budgeted***	**Amount Spent***	**Balance***	**Notes**
Equipment				
Field boots & clothing	200	197	3	
Field stationery	50	68	-18	
Total for equipment costs	250	265	-15	
Staffing Costs				
Project leader*	*900	900	0	**Paid by GWS**
Technical field staff for data collection	1,200	1300	-100	
Total for staffing costs	2,100	2200	-100	
Field Running Activities				
Board and lodging during field work	1,200	1245	-45	
Maintenance of field equipment	180	198	-18	
Meetings and PRA activities	400	398	2	
Total for Field Running Activities	1,780	1841	-61	
Travel costs				
Local travel costs (Incl. Field travels)	600	633	-33	
Total for travel costs	600	633	-33	
Project promotion and dissemination				
Public awareness	500	410.50	89.50	
Total for Project promotion and dissemination	500	410.50	89.50	
Professional Services				
Mapping services	300	293	7	
Total for professional services	300	293	7	
Administrative Costs				
Reporting	300	180	120	
Total for administrative Costs	300	180	120	
TOTAL PROJECT COST	**5,830**	**5,887**	**7.50**	

*** The currency of this budget was in GBP (£)**