

Darwin Initiative Annual Report

Important note:

To be completed with reference to the Reporting Guidance Notes for Project Leaders – it is expected that this report will be about 10 pages in length – Submission deadline 30 April 2007

Darwin Project Information

Project Ref Number	14-017
Project Title	Tool kits for the Sustainable Management of Ghana's Riverine Biodiversity
Country(ies)	Ghana, Burkina Faso, Nigeria, Cote d'Ivoire, Togo, Benin
UK Contract Holder Institution	University of Liverpool
UK Partner Institution(s)	
Host country Partner Institution(s)	University of Ghana
Darwin Grant Value	£63,856 (2006-7) £188,816 through project life
Start/End dates of Project	May 2005 – April 2008
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 April 2006 to 31 March 2007 Annual Report No 2
Project Leader Name	Prof E Maltby, Prof B Moss, Dr R T Leah, Prof Chris Gordon, May 2006
Project website	http://pcwww.liv.ac.uk/aquabiol/Darwin_Ghana/
Author(s), date	Prof E Maltby, Prof B Moss, Dr R T Leah, Prof Chris Gordon, May 2007

1. Project Background

The project is being undertaken with the Centre for African Wetlands at the University of Ghana but will eventually also train personnel from surrounding countries such as Burkina Faso, Nigeria, Cote d'Ivoire, Togo and Benin. The project aims to address the impediments that remain for Ghana (and its neighbouring countries) to applying the Ecosystem Approach (EA) to wetland management and the delivery of the Convention on Biodiversity (CBD). Priority needs have been identified as taxonomic capacity building, a contemporary assessment of the status of aquatic biodiversity in Ghana, the development of practical management tools for rivers and increased engagement of stakeholders in decision making together with an enhanced environmental awareness throughout Ghanaian society. These are being addressed in this project by regional and local staff training, reporting on the current status of aquatic communities, the production of educational and taxonomic resources for a range of users, the development of a set of nested indicators of ecosystem health adapted for use at various levels, and the production of a policy document outlining the means of applying the EA in the future management of Ghana's rivers.

Before the start of the project, it had been identified that although considerable background information existed on the fauna of rivers in some areas of Ghana through long term work on

the control of Onchocerciasis, there was limited faunal information for the rivers in the most populated regions of the country, together with little taxonomic capacity to describe the fauna. In addition, there was virtually no quantitative information on how local populations exploit resources associated with rivers and their environs. Thus, this project is designed around a one year programme of biological sampling of small rivers near to Accra (the Densu, Birim and Ayensu) around which a training programme could be built and the need for taxonomic identification materials can be identified. The biological sampling was to be conducted alongside a socio-economic survey to contribute to the other elements needed to complete the Ecosystem Approach to the management of natural resources. The collected data from the project will be used for training in data analysis methods as well as being used for a report on the biological state of some exemplars of Ghana's rivers. Eventually, all these outputs will feed into the preparation of a policy document on how Ghana should implement the requirements of the CBD in this context.



Fig 1: The Project Study Area

2. Project Partnerships

The main partnerships essential to delivery of the project are between the University of Liverpool, the Centre for African Wetlands, the University of Ghana (Zoology Department and the Volta Basin Research Project), The Water Research Institute of Ghana and the Ghana Wildlife Society. The Darwin Project has strengthened existing links between these organisations

The connection of the project with the Focal Point for the CBD has been strengthened in particular by inviting Prof Albert Oteng-Yeboah, the Chairman of the National Biodiversity

Committee to Chair the Public Meeting at the end of the January 2007 Workshop. This enabled a number of valuable discussions to be held.

Following up the Reviewer's comments on the 2006 Annual Report on the need to strengthen networks in Ghana, the project has also strengthened contacts during the year with:

1. Environmental Protection Agency
2. Water Resources Commission
3. Water Research Institute
4. Public Utilities Regulation Committee
5. National Development Planning Committee
6. Hydrological Services Department
7. Water Directorate, Ministry of Resources Works and Housing
8. Ghana Meteorological Agency
9. Forestry Commission – Wildlife Division
10. International Water Management Institute
11. Community Water and Sanitation Agency
12. Ghana Water Company

In the UK, there is now close collaboration with a British Council funded project which was run jointly by University of Newcastle and University of Ghana on the application of the Ecosystem approach to coastal ecosystems since a number of the team members have now moved to the University of Liverpool. Experiences have been exchanged and a mutually reinforcing network established.

Internally within the University of Liverpool, 'technology transfer' and exchange of experiences has progressed with the now completed Darwin Project (Ref No 162/12/034): South East Asian Wetlands Restoration Initiative.

3. Project progress

One of the real challenges of applying the Ecosystem Approach is in linking biological and socioeconomic issues in a single framework. We think that we have made significant progress in this direction at two levels during this year. One is at the village level where engagement was achieved with Chiefs and villagers in the study area. The second was at policy level by engagement with the Water Resources Commission who accepted that the project should produce the basis of a tool that will help them protect or restore biodiversity in the aquatic environment.

3.1 Progress in carrying out project activities

Training of Project Staff

Four Liverpool staff delivered further training to members of the Ghanaian project team during a week long visit in January 2007. The original intention was to provide further input into the first of the Regional Workshops for visiting scientists from Ghana's neighbours. However, in the event this could not be carried out as the intended external funding to CAW was not obtained in time. Further interactions, presentations and discussions of the scientific results, however, were completed with the team members.

Collection of biological and environmental data from the study sites for one year.

The planned field visits were completed during the year (plus two additional ones organised by the Centre for African Wetlands using non-Darwin funding) together with the appropriate chemical and biological analyses. The analysis of the resulting data is underway.

Socioeconomic Survey

The development of the questionnaire was finished and the agreed version was administered to villagers in the study area. The data have been collated and the analysis started.

Development of the tool-kit

A structure for the toolkit has been developed and work is ongoing to expand its content.

During the January 2006 workshop reported in last year's annual report, a set of ecosystem status indicators were developed in conjunction with Ghanaian stakeholders. These indicators relate to the physical, chemical and biological status of the ecosystem and form the basis of the tool-kit. Table 1 below lists these indicators.

Indicator number	Indicator description	Unit
1	Percentage of catchment still covered in natural/semi-natural vegetation	%
2	Change in total runoff	%
3	Volume of reservoirs within the catchment as a percentage of total runoff	%
4	Percentage of bank length (500m section) on both sides still occupied by natural/semi-natural vegetation	%
5	Concentration of available phosphate – P	µg/l
6	Concentration of available nitrate – NO ₃	mg/l
7	Concentration of available ammonium - NH ₄	mg/l
8	Concentration of total suspended solids (or Secchi disc depth)	mg/l or cm
9	Conductivity (percentage change)	%
10	DO (percentage saturation)	%
11	Temperature (difference from shaded stream)	Deg C
12	BOD	ppm
13	pH	pH units
14	Number of species of submerged native plants (<i>podostemonads</i> , <i>bryophytes</i>) (counted at site)	number
15	Number of species of introduced plants (e.g. <i>Pistia</i> , <i>Azolla</i>) (counted at site)	number
16	Percentage of benthic fauna that are that are other deposit feeders	%
17	Percentage of benthic fauna (numbers, families) that are <i>Plecoptera</i> , <i>Ephemeroptera</i> and <i>Trichoptera</i>	%
18	Percentage of benthic fauna (numbers, families) that are predators (measured on sorted samples)	%
19	Number (and types where they can be identified) of fish species (test fishing at site or compiled by local people)	number
20	Number of bird species recorded in standard time over 100m length of the river (assessed at site).	number

Table 1 Indicators used in the toolkit

The tool-kit interface has been developed in Microsoft Excel[®] as this provides a widely available software platform. This interface provides the analysis of the indicators and also provides links to the documents that together make up the toolkit.

As a component of the suite of documents that will make up the toolkit, guidance documents are being prepared for each of these indicators that provide the rationale for the inclusion of the indicator in the toolkit and guidance on quantifying the indicator, such as methodologies and sources of data. These documents have been completed for nine of the 20 indicators. The taxonomic resources being developed as part of the project will also be linked to the relevant indicators so that they can act as an aid to quantifying the indicators.

For each indicator, its measured value (from field or desk based assessment) is related to reference conditions that have been established in conjunction with the local partners and the UK experts in the consortium. The collection of the field data will also inform these reference condition values for some indicators. The output of this comparison is an assessment of each indicator according to whether its status is high, good, moderate, poor or bad.

Indicator description	Units	Value	Score		
Percentage of catchment still covered in natural/semi-natural vegetation	%	90	0.70		Good
Change in total runoff	%	10	0.70		Good
Volume of reservoirs within the catchment as a percentage of total runoff	%	16	0.70		Good
Percentage of bank length (500m section) on both sides still occupied by natural/semi-natural vegetation	%	75	0.50		Moderate
Concentration of available phosphate - P	µg/l	0.6	0.70		Good
Concentration of available nitrate – NO3	mg/l	5	0.00		Bad
Concentration of available ammonium - NH4	mg/l	5	0.00		Bad

Table 2 Sample output from indicator assessment

Individual indicator assessments are combined using Multicriteria Analysis (MCA) into an overall assessment for the site being considered. MCA uses a weighting system whereby the importance of each of the indicators is weighted and an overall score for the site is calculated using a weighted average. This overall score is categorised to give an assessment for the site as to whether its ecological status is high, good, moderate, poor or bad.

The final stage of the toolkit is an assessment of the best measures to put in place to improve the status of the indicator and overall ecological status. Workshops during the January 2007 visit by the UK partners to Ghana have identified a set of potential measures that could be put in place in Ghana to address ecological status, including for example habitat restoration, fertiliser reduction or reduction of sewage effluent. The measures identified reflect the capacity within Ghana to implement measures aimed to improve ecological status. The toolkit identifies which measures have the greatest influence on which of the indicators and, by taking into account the status of the indicators, suggest which measures should be given priority. Documents will be produced linking to each of the measures in the toolkit that give outline guidance on implementing the measures, sources of further information and, where available, Ghanaian or West African case studies.

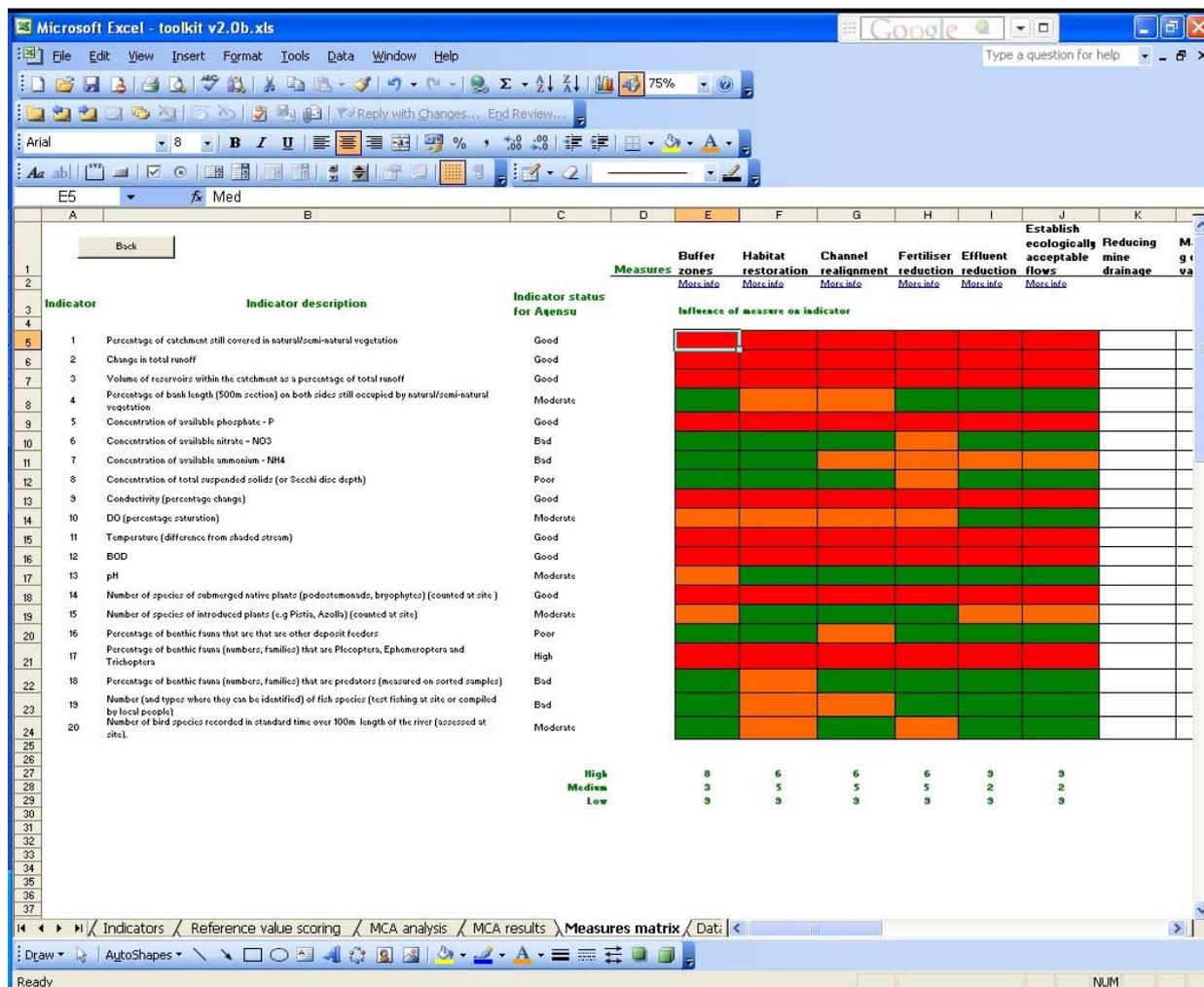


Figure 1 Screenshot of measure assessment table in toolkit

3.2 Progress towards Project Outputs

Output 1 - . Training workshops held for staff.

The planned training workshop was held during January 2007, completing the planned training for the Project staff. However, the planned workshop for Regional partners from neighbouring countries has been rescheduled to later in 2007 because of external funding delays.

Output 2 - Range of educational and taxonomic resources produced.

These have been discussed among project staff and preparation is underway.

Materials at three levels are being prepared, these are:

- Laminated Field sheets suitable for Primary school children
- Detailed field guide to the distribution of major aquatic faunal groups
- Monographs on genera for the expert

Output 3 – A nested set of indicators of ecosystem health

The development of the framework for the toolkit represents significant progress towards the completion of Output 3 ('A nested set of indicators of ecosystem health'). The completion of the toolkit requires:

- Completion of the guidance document on the indicators
- Establishment of the weighting system for the indicators
- Completion of the guidance documents for the measures.

As discussed above, the range of educational and taxonomic resources produced as Output 2 will also be linked to the toolkit.

The output level assumption for this output was that sufficient stakeholders would be recruited for testing and dissemination of the toolkit. The engagement from the Water Resource Commission and overall attendance (40 participants from Ghana) at the January 2007 workshop demonstrate that this assumption still holds true. The level of commitment from the wide range of Ghanaian partners will also ensure that the dissemination and testing of the toolkit will be successful.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
Established codes						
6A	Number of people to receive other forms of education/training	(6) 20	(80) 40			
6B	Number of training weeks to be provided	(1) 1	(4) 4 ^{*1}			
7	Number of (i.e. Different types – not volume – of material produced) training materials to be produced by host country	(6) 3	(60) ^{*2} 10			
8	Number of weeks to be spent by UK project staff on project work in host country	(7) 4	(10) 4 ^{*2}			
10	Number of individual field guides/manuals to be produced to assist work related to species identification, classification and recording	(6) [#] 0	(20) ^{* 0} ³			

11A	Number of papers to be published in peer reviewed journals	(2) [#] 0	(0) 0			
12A	Number of computer databases to be established	0	(1) 1			
13A	Number of species reference collections to be established and handed over to the host country	0	(2) 1 ^{*4}			
15A	Number of national press releases in host country	(1) [#] 0	(0) 1			
15B	Number of local press releases in host country	(1) [#] 0	(0) 1			
15C	Number of national press releases in UK	(1) [#] 0	(0) 1			
15D	Number of local press releases in UK	(1) [#] 0	(0) 1			
New - Project specific measures						

Notes

- # Original targets for year 1 transferred to year 2 in 2005-6
- *1 4 x UK staff conducted 1 week training in Jan 2007. Other training deferred, as discussed above.
- *2 The target for types of material was reduced in 2006 as individual sheets originally envisaged were combined into more substantive booklets.
- *3 Work in host country rescheduled until prior to the regional training workshop
- *4 These are in an advanced stage of development but the output has been rescheduled to year 3 to link with the final form of the toolkit
- *5 The preparation of the reference collection is an on-going process which has been extended with material from the extra field collections that were completed in early 2007.

Table 2 Publications

Type *	Detail	Publishers	Available from	Cost £
(eg journals, manual, CDs)	(title, author, year)	(name, city)	(eg contact address, website)	(if applicable)

3.4 Progress towards the project purpose and outcomes

Substantive discussions were held with staff from the Water Resources Commission, the most important Government Department with respect to the management of water resources in Ghana. Their promise of support that was obtained should ensure that project outcomes can eventually be implemented.

The developing toolkit and Excel interface provides a useful and technologically appropriate tool for water managers in Ghana (e.g. Water Resources Commission) and NGOs (e.g. Wildlife Clubs) to start the process of systematically monitoring the status of riverine ecosystems. As such it makes a significant contribution to the project purpose of developing the sustainable management of Ghana's riverine wetlands in accordance with the Ecosystem Approach.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The interaction with stakeholders has gone well. The area Chiefs have given their support so that the villagers contributed willingly to the process. They were pleased (and somewhat surprised) to be consulted and are now 'primed' to become involved in the equitable sharing of biodiversity benefits.

4. Monitoring, evaluation and lessons

Over the course of the project, progress has been monitored through visits to the host country for meetings, training and workshops plus a visit of the senior Ghanaian partner to Liverpool. The success of this approach is demonstrated by the fact that it was possible to adapt the project structure to respond to changing circumstances throughout the project.

5. Actions taken in response to previous reviews (if applicable)

Reviewer's Comment:

"The project start-up suffered a 6-months delay that has still to be caught-up: the plan is to do this during the 2006-07 year. This should be carefully managed to ensure make sure that critical activities are not overlooked in the race to catch-up."

Response:

Progress has been made in catching up with the original plan although not as fast as we would like.

Reviewer's Comment:

"There is reportedly good interaction with and ownership by the Ghanaian team and institutions, although less so to date on a regional basis. This interaction should lead to good ownership and institutionalisation of findings. It appears that presently, the project aims to engage regionally through inviting a few regional scientists to a short training workshop: it remains to be seen whether this extent of regional collaboration really delivers meaningful involvement. The team need to be wary of short-cutting these regional links as part of the 'catching-up' for the delay at the beginning of the project. It is recommended the planned regional collaborations are re-assessed and reported on in the next half-yearly report."

Response:

As suggested, there are good relationships within the Ghanaian organisations involved which hold the promise of the project delivering on its aims and they have been substantially strengthened during 2006-7. Considerable effort has been made by the Ghanaian team to enhance their networks of contacts in the West African Region and this is now beginning to bear fruit. The main initiative for this is partnerships with the GEF Project on the Guinea Current Large Marine Ecosystem. The project, which is headquartered in Ghana, runs events for partners in the 16 nation project. Currently we are discussing the possibility of adding a few days to one of their upcoming workshops on biodiversity to introduce the ecosystems approach as stated in the Project Document. However, it has not yet proved possible to confirm the dates for the regional training meeting originally due in early 2007. However, Prof Gordon has now received confirmation of funding for the later workshop due in 2008. This will be jointly

organised with a consortium including The Scholarship Research Institute, the International Water Management Institute and funds from IGBP-START held by the Centre for African Wetlands which functions as the Regional Node for Wetlands and Coastal Systems. Further efforts are being made to obtain funding that can be utilised at an earlier date, but if necessary, the 2008 funding will be used for a 'postponed' 2007 event and a request made to extend the project timetable.

Reviewer's Comment:

"Based on the evidence provided, the practical toolkit is still a long way off: the outputs still remain rather academic at this stage and methods are still being developed. However, it should be noted that this is only the first annual report and these will come through the findings of the research. Nevertheless, it is suggested that the link between the research and data collection on the one side and the development of the toolkits is clarified in the next half-yearly report. As part of this clarification, it is recommended that the use of the long questionnaire (99 questions requiring a response from people who are largely illiterate villagers) is reconsidered. It will produce vast amounts of data, of value for quantitative research such as a PhD study, but it should be carefully considered whether it provides any longer term value for staff on the ground, where participative research assessments with villagers are likely to yield more valuable outcomes."

Response:

The rationale of the project structure has been enhanced (see section 1 for further explanation). The practical toolkit has undergone considerable development during the year both in Liverpool and Ghana and example screenshots are provided in this report. With respect to the long questionnaire, a number of further discussion meetings were held in Ghana by the Ghanaian partners resulting in various improvements in the design of the questionnaire as well as what the toolkit will eventually contain. Despite the large number of questions, the improved questionnaire was successfully delivered to villagers in the study area by the team from the University of Ghana and the Ghana Wildlife Society (GWS) in a programme that was completed by January 2007. The support of the area Chiefs was vital in ensuring the enthusiastic participation of the villagers. Such a high level of co-operation was obtained through the prior groundwork put in by the GWS. The data that has been collected is being analysed by Dr Erasmus Owusu and his assistants from the GWS and it is hoped that the findings will be reported later this year.

Reviewer's Comment:

"There is clearly potential for collaboration with relevant Government and NGOs with respect to institutionalising the toolkit in the country and thus having an impact beyond the University research sub-sector. Some linkages have been explored and by the time the next annual report is ready, these should be further developed and reported on."

Response:

The potential recognised by the Reviewer was actively pursued during the year. Prior to the main public meeting during January 2007, Prof Chris Gordon organised a series of one to one meetings between Liverpool staff and relevant organisations in their offices around Accra. This was very productive and resulted in ca 20 people from various relevant Government Departments, NGOs, Further Education Colleges and Schools joining the team on the last day of the 2007 Workshop (see Section 2 for a list of the organisations with whom networks have been strengthened during the year). The overall issue of further improving collaboration was then addressed in public discussions during the meeting chaired by the Chairman of the National Biodiversity Committee, Prof Alfred Oteng-Yeboah (who is the CBD focal point for Ghana). A number of organisations, including the Water Resources Commission, the most important governmental organisation in Ghana with respect to the management of water resources, promised their on-going support.

6. Other comments on progress not covered elsewhere

The project webpage has already resulted in several approaches being made to the University of Ghana for collaboration in the areas of research proposal development and supervision of external PhD students:

The Natural Heritage Institute has requested assistance in identifying stakeholders for input into a proposal for restoring ecological flows in the lower Volta. A meeting will be held at the end of May 2007 at which the Toolkit in its present form will be demonstrated.

The Centre for African Wetlands received a request from Prof Paul Kirshen, Department of Civil and Environmental Engineering, Tufts University (USA) to assist in the local supervision of one of their Ph.D. Students Ms. Yongxuan Gao who will spend eight months in Ghana from July 2007 working on impacts on small dams on riverine biodiversity.

There had been delay in provision of a projector to the Ghanaian partners during 2005-6 for use in scientific meetings and training sessions. This was procured and delivered during 2006-7 and is now proving very useful in the Centre for African Wetlands.

7. Sustainability

The interactions during the year, particularly the one-to-one discussions with Mr Ben Ampomah from the Water Resources Commission indicate long-term support and ownership of the outcomes of the project at government level which should ensure one aspect of sustainability. The Ghanaian Wildlife Society is a partner in the project and is essential to achieving sustainability within the wider community. It is a membership organisation and promotes the work and participation amongst its members. By its constitution, it is involved in conserving biodiversity and as part of the project, their staff are being trained and will continue involvement in this type of work after the project finishes. The involvement with this type of biodiversity assessment is novel for the society. The Society together with the University of Ghana infrastructure provides the basis for continuity beyond the life of the project.

Some results of the Darwin Project have been incorporated in a revision of the content of the Graduate course in Water Resource Management taught as part of the M.Phil. Environmental Science Programme of the Faculty of Science, University of Ghana. The Darwin Project has also fed into the International undergraduate course in Water Resource Management that would be taught onboard the ScholarShip, an International education project (<http://www.thescholarship.com/>).

Raising the profile of the project within Ghana was addressed in various ways during 2006 by the Ghanaian team. This was consolidated by arranging a public 'launch' of the project website during the January 2007 visit by staff from Liverpool which was part hosted and attended by Mr Chris Brealey, Foreign and Commonwealth Office in Accra on behalf of the UK Government. In addition, he agreed to promote this project through his network of contacts in Ghana.

Considerable press interest was generated in Ghana which resulted in 18 journalists attending the meeting, with interviews on television and radio and a number of articles in the local press (see Annex 3). An associated UK press release was issued (see http://www.liv.ac.uk/newsroom/press_releases/2007/04/ghana.htm) which has generated some interest in the UK and an application for a UK student to go on placement to assist with the project in Ghana.

Now that the website is available it is being further developed and linked in with the websites of other Ghanaian organisations involved in biodiversity and conservation, education and tourism.

This is a relatively low cost means of generating interest whilst providing information which can be maintained at low cost into the future. In the longer run, publications, taxonomic guides and more material of general interest will be made available via the website as was the report from the January 2006 Workshop.

8. Dissemination

A further training workshop for the Darwin Initiative Team was delivered in January 2007 who will have the task of disseminating the outcomes of the project and eventually training staff from Regional Organisations.

The opportunity of the training workshop in January 2007 was used to raise the profile of the project within Ghana. The improved project website was 'launched' by Prof Albert Oteng-Yeboah, the Chairman of the National Biodiversity Committee. Added interest was achieved by the fact that it was switched on 'wirelessly' in Liverpool across the Sahara Desert using the internet.

The preparation of various planned publications and training materials are now underway using the inputs now generated by the project. However, as they are partly dependent on on-going developments, none of the final versions (other than lecture notes and slide sets) have yet been finished.

The programme of more than one year of field sampling was completed (and actually extended for two further occasions using locally provided funding) by the end of 2006. Presentations of results from the Ghanaian team members and discussions of the results were held during the January 2007 visit with scientists from Liverpool.

Part of the project involves a questionnaire survey of villagers (stakeholders) in the study area. The questionnaire was developed through discussion of team members and stakeholders led by the Ghana Wildlife Society. As a prelude to the surveys, the project was explained to local village chiefs who were instrumental in obtaining involvement by villagers. Co-incidentally with the Workshop for this project, the University of Ghana was holding its annual 'New Year School' for representatives from communities across Ghana. The aim for this year was to discuss the Environmental Status of Ghana and since attendees included representatives from the District Assemblies from the Tema and Accra regions, they were invited to the website launch and subsequent refreshments (see Annex 3 d). As a consequence, a number of people attended including one Chief in full traditional regalia.

9. Project Expenditure

Table 3 Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Project 14-017

Ghana Riverine Biodiversity 2006-7

Liverpool

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for ECTF and the Darwin Secretariat to publish the content of this section

Ghana is currently experiencing significant water resource problems exacerbated by drought and the possible longer term effects of climate change. The Water Resources Commission (WRC) has recognised the complexity of the challenges to meet the needs of people, development and biodiversity against a background of population growth, urbanisation and the need to maintain environmental quality. WRC has publicly identified the role of the Darwin Ghana project in contributing to the development of a more integrated approach to water resource management. Based on a practical tool-kit, the project has already raised awareness of an approach which can assist planners and local authorities to better deal with the conflicting demands for and pressures on Ghana's rivers and associated biodiversity.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
<p><i>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			(do not fill not applicable)
<p>Purpose: The sustainable management of Ghana's riverine wetlands in accordance with the principles of the Ecosystem Approach</p>	<p>Improved quality of riverine wetlands. Enhanced taxonomic capacity in Ghana and other W African countries. Integration of freshwater management into CBD implementation.</p>	<p>Taxonomic materials are in preparation. Closer contact has been established with the Focal Point for the CBD. Initial contacts made with other W African Countries. Funding obtained for workshop in 2008.</p>	<p>Continued search for funding for 2007 Regional Workshop. Completion, review and publication of taxonomic materials.</p>
<p>Output 1. Training workshops held for staff.</p>	<p>Six project staff trained in year 1. Twenty project staff trained in year 2. Twenty regional scientists trained in each of years 2 and 3.</p>	<p>The planned training of the project staff has now been achieved. However funding for the attendance of staff from Ghana's regional neighbours during year 2 (2006-2007) has not yet been forthcoming although funding has now been confirmed for a workshop to be held in year 3 of the project, although not until early 2008. If no further funding for is obtained for the originally planned workshop, it will necessitate a postponement of the end of the project to enable it to meet its intended outcomes</p>	
<p>Activity 1.1</p>			

Activity 1.2,		
Output 2. Range of educational and taxonomic resources produced.	Material will be reviewed by expert group, partners and others (e.g. Ghana Education Service). Distribution through existing networks (e.g. GWS).	The material is being prepared and appropriate reviewers identified
Activity 2.1.		
Activity 2.2.		
Output 3. A nested set of indicators of ecosystem health produced	Stakeholders trained in the use of tools. Tools field tested by stakeholders	Progress and achievements: Development of toolkit interface and prototype tools Initial training and consultation with stakeholders on the prototype toolkit Actions required Completion of guidance documents for toolkit Training of stakeholders (Ghana and region) in application of toolkit.
Output 4.	A report on current status of aquatic communities in Ghana	The data for this has been collected and is currently being analysed. The Report will be prepared during the year.
Output 5	Policy document on the application of the EA in the management of Ghana's rivers	This will be prepared during the year.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <p>the conservation of biological diversity,</p> <p>the sustainable use of its components, and</p> <p>the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</p>			
<p>Purpose</p> <p>The sustainable management of Ghana's riverine wetlands in accordance with the principles of the Ecosystem Approach</p>	<p>Improved quality of riverine wetlands. Enhanced taxonomic capacity in Ghana and other W African countries. Integration of freshwater management into CBD implementation.</p>	<p>Ghana's reporting to CBD. Institutional reports. Reports of training courses. Uptake of taxonomic materials.</p>	<p>Ghana maintains engagement with CBD. Trained staff remains in post.</p>
<p>Outputs</p> <p>1. Training workshops held for staff.</p>	<p>Six project staff trained in year 1. Twenty project staff trained in year 2. Twenty regional scientists trained in each of years 2 and 3.</p>	<p>Attendance records. Results of assessments. Course reports. CAW's records of correspondence and resource use.</p>	<p>CAW's existing regional networks continue. Sufficient participants for regional workshop recruited (travel expenses will be paid by CAW)</p>

2. Range of educational and taxonomic resources produced.	Material will be reviewed by expert group, partners and others (e.g. Ghana Education Service). Distribution through existing networks (e.g. GWS).	Material published and distributed to key stakeholders and partners. Copies sent to Darwin Initiative.	Partners remain committed to production of outputs. Stakeholders willing to receive resources.
3. A nested set of indicators of ecosystem health produced.	Stakeholders trained in use of tools. Tools field tested by stakeholders.	Attendance records for training courses. Results of field testing distributed to national/regional stakeholders/scientists/CBD focal point	Sufficient stakeholders recruited for testing and dissemination.
4. A report on current status of aquatic communities in Ghana	Manual peer reviewed. Publication by CAW agreed	Published reviews. Copies sent to Darwin Initiative.	N/A
5. Policy document on the application of the EA in the management of Ghana's rivers	Document peer reviewed. Publication by CAW agreed. Disseminated to Ghana's CBD focal point.	Published reviews. Copies sent to Darwin Initiative. Minutes of meeting with focal point sent to Darwin Initiative.	Focal point available for meeting.

Activities	Activity Milestones (Summary of Project Implementation Timetable)
Training of project staff	Workshop 1 (month 2) for 6 staff covering EA, macroinvertebrate, macrophyte and fish sampling and identification, physico-chemical techniques. Workshop 2 (month 16) for 20 staff preparing project staff for stakeholder training (20 staff)
	Workshops 1 & 2 (months 16 & 28) for 20 regional scientists from 6 countries
	Workshop 1 (month 16) on use of tool-kit. Workshop 2 (month 36) for dissemination.
	Prototype tool-kit (months 8-16). Final Tool-kit (months 8-33)
	Testing by stakeholders (months 17-27)
Training of regional scientists	Production of materials for community groups, schools and water managers, including web-based keys, picture keys, school work sheets, posters and leaflets (months 30-36)
	Report accepted for publication by CAW (month 36)
Training of stakeholders	Document peer reviewed and CAW acceptance for publication (month 36)
Development of tool-kit	
Testing of prototype tool-kit	
Production of educational and taxonomic resources	
Production of report	
Production of policy document	

Annex 3 onwards – supplementary material (optional)

3(a) Organisations represented by Journalists at the Website Launch, January 11th 2007

The Independent Newspaper (Ghana)

The National Concord

Public Agenda

Ghana News Agency

The Daily Graphic

Ghanaian Times

Accra Daily Mail

Graphic Communication Group Ltd

Peace FM

Radio Universe

Metro TV

The Searchlight

The Moment Newspaper

3 (b) Programme for Website Launch, January 11th 2007

LAUNCH OF WEBSITE ON
 TOOLKITS FOR THE MANAGEMENT
 OF GHANA'S RIVERINE BIODIVERSITY
 11TH JANUARY, 2007

Venue: Centre for African Wetlands, Legon-Ghana

09.30	-	10:00	Registration	
10:00	-	10:05	Welcome and Introduction of Chairman	Prof. W. A. Asomaning
10:05	-	10:10	Chairman's opening remarks	Prof Albert Oteng-Yeboah
10:10	-	10:15	The Water Resource Commission	Mr Ben Ampomah
10:15	-	10:20	Background to the Ecosystem Approach	Prof. Edward Maltby
10:20	-	10:35	The Darwin Project on Riverine Ecosystems	Prof Chris Gordon
10:35	-	10:40	The Darwin Initiative / FCO in Ghana	Mr. Chris Brealey
10:40		10:42	Launch of the Website	Prof Albert Oteng-Yeboah
10:42	-	11:00	Demonstration of the Website and Toolkit	Dr Conor Linstead
11:00		12:20	Questions, Comments and General Discussion	Participants and Press
12:20		12:25	Chairman's closing remarks	Prof Albert Oteng-Yeboah
	-		Refreshments	

3 (c) Project Relevant Articles in some of the Ghanaian Press

Article which appeared in the 'Daily Graphic', Accra as a result of the website launch

Daily Graphic, Thursday, January 11, 2007.

Commission launches website on freshwater

THE Water Resources Commission will soon launch a website that will contribute towards the preservation of the country's fast depleting freshwater biodiversity.

A statement from the commission said, "the website will provide a mechanism for the exchange of information among team members to ensure long-distance collaboration, as well as a platform for holding interactive group discussions".

According to the statement signed by the Public Relations Officer, Mrs Adwoa Munkua Dako, the website, which would be launched at the Centre of African Wetlands (CAW), Legon, today was the outcome of an international project between Ghana and the United Kingdom.

It added that the collaboration had the CAW, the University of Ghana, the Water Research Institute of the Council for Scientific and Industrial Research (CSIR-WRI) and the Ghana Wildlife Society as the local partners, while the main UK collaborator was the Integrated Management Ecosystem Research (SWIMMER) of the University of Liverpool.

"The three-year project, known as 'toolkits for the sustainable management of Ghana's riverine biodiversity', is aimed at adopting 'ecosystem approach' for managing natural resources within West Africa," the statement said.

The toolkit is expected to assist the commission to enforce its mandate of regulating and managing the country's water resources.

It said Professor Edward Maltby, the Project Leader, had noted that ecosystem approach would provide a means of achieving sustainable development objectives of the Convention on Biodiversity and added that the toolkit would represent a major contribution towards achieving the objectives.

According to the statement, Professor Chris Gordon, Project Co-ordinator of the Ghana Team, noted that this was the first attempt to address holistically the priority needs of taxonomic capacity building, assess the status of aquatic biodiversity, the development of practical management tools for rivers and increased engagement of stakeholders in decision-making in one project.

Annex 3 (c) More Detailed article which appeared in the Daily Graphic , Accra on the day following the launch.

Daily Graphic Jan 12 2007

'Let's have policy on water management'

Story: Hilda Owusu

THE acting Executive Secretary of the Water Resources Commission (WRC), Mr Ben Ampomah, has called for an integrated water resource management policy to ensure that water does not become a constraint to national development.

He pointed out that with changing trends in population growth and urbanisation, including water for irrigation, hydro-power generation, industrial processes and aquatic ecosystem protection, the resource was becoming increasingly scarce, calling for immediate action.

He indicated that the long-term development plan of the country recognised water in relation to its management and uses as an essential component of human development and a factor in the country's current development priorities.

Mr Ampomah made the call at the launch of a "Website on Toolkits for the Management of Ghana's Riverine Biodiversity" project in Accra yesterday. The website is

at pcwww.liv.co.uk/aquabiol/Darwin_Ghana.

The project, which is expected to develop

the "Ecosystem Approach" to managing natural resources within Ghana and West Africa, is a collaborative initiative between Ghana and the United Kingdom (UK) and stakeholders, with support from the Darwin Initiative, a grant programme funded by the UK Department of Environment, Food and Rural Affairs (DEFRA).

The launch of the 'toolkit' followed field work which was carried out in the Ayensu, Birim and Densu rivers in the Akyem area of Ghana to assist planners and local authorities in decision making, as well as provide educational materials for capacity building at all levels.

Elaborating on the ecosystem approach, Professor Edward Maltby of the University of Liverpool's Institute for Sustainable Water, Integrated Management and Ecosystem Research (SWIMMER) said the approach was a strategy for the integrated management of land, water and living resources which promoted conservation and use in an equitable way.

He explained that the approach, which was in line with the Convention on Biological Diversity (CBD), was a highly flexible methodology which could be adapted to a wide range of situations and particular

problems of sustainable natural resource management.

According to Prof Maltby, the approach embraced all factors, including social, economic, cultural, as well as scientific and technical, which had a bearing on the problem to be considered and noted that the approach was underpinned by 12 principles and notes of guidance which had been distilled through consultation and development.

The Ghana Project Co-ordinator, Professor Chris Gordon, said the project would, among other things, promote the development of practical tools in the country which would be useful for the management of rivers, enhance environmental awareness and improve the taxonomy capacity by assessing the status of existing aquatic biodiversity.

In his closing remarks, the chairman for the occasion and Chairman of the Ghana National Biodiversity Committee, Professor Alfred Oteng-Yeboah, said with the year 2020 indicated as the year for water reduction, Ghana had envisioned itself to tackle the impending doom by signing up to the convention and producing such an important project.

Annex 3 (d)

Invitation to New Year School to Press launch

Launching of Webpage and Environmental Toolkit

**Special Invitation to 58th New Year School Participants:
Our Environment and Our Health**

Toolkits for the Management of Ghana's Riverine Biodiversity

9:30 a.m. 11th January, 2005

Venue: Centre for African Wetlands (CAW), Legon Conference Room

CAW contacts
Tel: 512835/6
Fax: 512837
e-mail:
afriwet@idngh.com

The main aim of the project entitled "Toolkits for the sustainable management of Ghana's riverine biodiversity" is to develop the "Ecosystem Approach" to managing natural resources within Ghana and West Africa.

This international project is a collaborative initiative between Ghana and the UK. The project is led by the Centre for African Wetlands (CAW) with partners from the University of Ghana, the Council of Scientific and Industrial Research Water Research Institute (CSIR-WRI) and the Ghana Wildlife Society on the Ghanaian side and the main UK collaborator is the University of Liverpool's Institute for Sustainable Water, Integrated Management and Ecosystem Research (SWIMMER).

The field work has been carried out in the head waters of the Ayensu, Birim and Densu rivers in the *Okyeman* area of Ghana, covering habitat description, physico-chemical characterisation of the waters and a survey following the 12 principles of the Ecosystem Approach. The field work has provided the basis for the "toolkit" which is aimed at planners and local authorities as an aid to decision making. Educational materials for capacity building at all levels are another key output.

We take this opportunity to invite New Year School participants with interest in Environmental Management to participate in toolkit development and contribute at this unique event.

The event is supported by the British High Commission, Ghana and the Ghana Water Resources Commission.

Programme Starts 9:30 a.m. 11th January, 2005

09:30 - 10:00	Arrival and Registration of Participants	
10:00 - 10:05	Welcome and Introduction of Chairman	Prof. W. A. Asomaning
10:05 - 10:10	Chairman's opening remarks	Prof Albert Oteng-Yeboah
10:10 - 10:15	The Water Resource Commission	Mr. Ben Ampomah
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12:20 - 12:25	Chairman's closing remarks	Prof Albert Oteng-Yeboah

Refreshments

The work is supported by the Darwin Initiative, a grant programme funded by the UK Department of Environment, Food and Rural Affairs (Defra), which aims to promote Biodiversity, Conservation and Sustainable Use of Resources by using UK biodiversity expertise working with local experts in countries that are rich in biodiversity but poor in financial resources. The Darwin Initiative was launched at the 1992 Earth Summit in Rio.

