

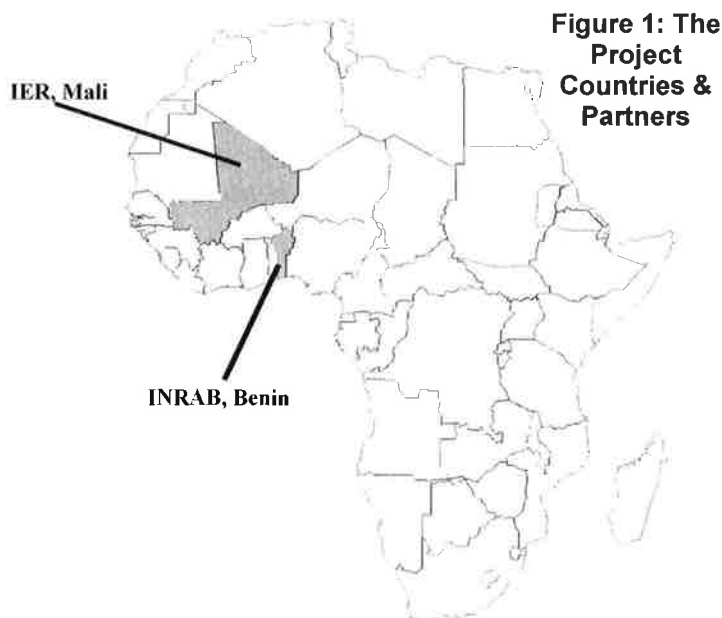
Darwin Initiative – Final Report

Darwin project information

Project Reference	15-003
Project Title	Conservation of Biodiversity in Traditional West African Vegetable Species
Host country(ies)	Benin, Mali
UK Contract Holder Institution	Bangor University
Host Country Partner Institution(s)	Institut National de Recherches Agricoles du Bénin (INRAB) Institut d'Economie Rurale (IER) (Mali)
Darwin Grant Value	£245,454
Start/End dates of Project	May 2006 – October 2009
Project Leader Name	Dr. M. Pasquini (up to June 2009), Dr. E.M. Young (from June 09)
Project Website	http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin1.php
Report Author(s) and date	Dr. M. Pasquini, Dr. F. Assogba-Komlan, Dr. E.M. Young, Mr. S. N'Danikou, B. Ambrose-Oji, Mr. E. Achigan-Dako – 11 February 2010

1 Project Background

This project's purpose was the improved conservation and sustainable use of biodiversity in Mali and Benin (Figure 1) by cataloguing indigenous vegetable (IV) species, domesticating selected species and promoting their value to producers and consumers (expected outputs: catalogue of biodiversity of IV species, seed banks for future research, domestication trials for selected threatened species, awareness-raising activities at policy and grassroots levels, and capacity-building for the local partners). Outstanding achievements include: a detailed catalogue on the distribution, agro-ecology, uses, threats, for 245 species in Benin; a Beninese researcher completing an MSc degree at Bangor University; leverage of several grants to work on related topics.



2 Project support to the Convention on Biological Diversity (CBD)

This project coincides primarily with the issues set out in the CBD's Agricultural Biodiversity thematic programme, as it has collected extensive information on the crops and wild plants that are harvested and managed for vegetable use, also documenting the traditional knowledge of different sociolinguistic groups. In West Africa research on traditional vegetables has been very limited. The conservation community has tended to focus on protected areas, neglecting the considerable plant diversity that is found in other environments, whereas the agricultural research sector has tended to focus on widely cultivated species (often exotic), overlooking the significant contributions of lesser cultivated species (including newly domesticated species) and wild managed plants.

The project has contributed to the conservation of these species firstly by documenting what resources are being used and how, and identifying which species may be under pressure. Secondly, in Benin it has carried out widespread awareness-raising activities, through radio, television, urban demonstration gardens and a high level policy-research meeting. Amongst others it has engaged stakeholders at the local University, Bioversity International¹, CIRAD², the Ministry of Agriculture, Livestock and Fisheries and the Ministry of Water and Forests. There has been a strong response and engagement, and several species-specific projects funded through in-country resources have been set up.

The project is also coherent with the vision of the CBD's Biodiversity for Development cross-cutting issue. Traditional vegetables are important resources for rural households, both in terms of nutritional contributions and income generation. The project established that there are several wild harvested resources that communities value, but report to be declining in the local environment. By initiating on-station and participatory on-farm domestication trials for these species the project has sought to support community livelihoods, whilst also reducing harvesting pressure on natural populations.

This project ran between mid-2006 and late 2009, and in the first years it was focused on collecting missing baseline information. For this reason, its contributions cannot be assessed against the 2010 target, though over the longer-term, the project outputs will support the two countries in their efforts to reduce its biodiversity loss.

As mentioned in previous reports, the partnership has supported INRAB and IER to build their capacity to meet the Convention on Biological Diversity (CBD) commitments as it concerns vegetable biodiversity, a research angle that is fairly novel for both institutions. In Benin, the project has built the capacity of existing INRAB staff, but also young graduates who started under the DI project with fixed-term contracts, several of whom have been retained at INRAB.

In Mali, meetings were held with the CBD focal point in the first years of the project. The project partners in Benin also maintained a regular contact with the CBD focal points, through personal visits and extending invitations to the project key events. The recognition of the value of the DI project work to Benin is shown by the fact that the link to the online version of the traditional vegetable catalogue was posted on Benin's Clearing House Mechanism website (<http://bj.chm-cbd.net/>).

The contributions made by different components of the project to the main measures of biodiversity conservation defined in the CBD Articles have been summarised in Annex 3.

The project has not supported other biodiversity conventions.

¹ Formerly the International Plant Genetic Resources Institute, part of the Consultative Group on International Agricultural Research.

² A French organization which focuses on agricultural research and development.

3 Project Partnerships

All partners have been involved in project planning and decision-making from the outset.

Through a DI scoping award, Dr. Pasquini was able to travel to Mali to visit IER for a week and Dr. Young was able to travel to Benin to visit INRAB and the University. These visits ensured that country priorities were fully taken into account and that the project answered a definite in-country need. It allowed partners to jointly outline the project concept and work plan and necessary budgets. No formal memorandum of understanding was established.

The details of the first 18 months of activities were developed jointly at an opening workshop in Benin in May 2006. Subsequently a mid-term review workshop held in Mali allowed the team to meet again and review respective project findings, and develop country plans for the subsequent months.

The dissemination activities carried out in the third year in Benin were finalised following a small consultation workshop which saw the participation of researchers from the University and Bioversity, urban farmers, the deputy cabinet Director from the Ministry of Agriculture, Livestock and Fisheries, members from the extension department of INRAB, radio presenters and others.

Following the joint general planning activities, each partner took responsibility for the detailed planning and management of specific components of work, according to their respective areas of expertise. So, for example, the host country partners developed the methodology for the domestication trials, whereas the UK partner was responsible for analysing the socio-economic data. Progress of each component was generally reviewed during Dr. Pasquini's visits to the host countries. These visits were also used to develop the work plan of certain components where it was deemed that joint planning would most beneficial, as in the case of some of the awareness-raising activities.

There were strong elements of capacity exchange within and between the host countries. For example, in Benin there was a close collaboration between INRAB and the researchers at the local University. Various researchers from the University for example took part in the ethno-botanical missions, whereas INRAB supported researchers at the University with advice and seed materials from the on-station garden on a new project on four traditional vegetables. As mentioned above, various stakeholders were consulted to obtain advice and guidance on the plans for dissemination, and throughout the project individual meetings were held to obtain feedback on specific project components.

In terms of exchanges between countries, as well as those that took place during the general planning meetings, in the first year the training on seed collection techniques organised by Dr. Sanou was complemented by training from one of the Benin team members, Dr. Achigan-Dako. In the second year, a visit by Mr. N'Danikou from the Benin team provided the opportunity to work through the determinations of the original 90 plus herbarium specimens and correct about 35% of them.

The main challenge with the partnership was the question of staff availability. In both countries the institutions work with a limited number of tenured staff. Staff turnover, particularly with younger staff on temporary contracts, is a structural constraint that is difficult to address.

In Benin, the project leader Dr. Assogba-Komlan worked within these constraints by writing grant proposals for in-country funding opportunities on related themes to complement salaries and keep a number of the younger staff on the team, and by involving researchers from the University and on occasion other institutions for specific short-terms tasks.

The involvement of these additional stakeholders to seek advice and ideas at the planning stages and on occasion during fieldwork activities has actually been a strong feature of the project in Benin, as it has resulted in a wider pool of researchers developing an interest in the project topic and a better coordination of research efforts in Benin.

The project found that organising consultation events or meetings, and events to share project outputs which also allows researchers working on related projects to showcase their own research, is important to minimise duplication of efforts and competition.

In Mali, staffing constraints (detailed in previous reports) eventually led to the termination of the project field activities at the end of the second year, under recommendation of the project reviewer.

There was no involvement with other UK or regional institutions.

4 Project Achievements

4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

This project was not designed to have a direct impact on biodiversity, as the focus on the conservation of traditional vegetables was novel in the two countries. Indeed, as the fourth national CBD report for Benin indicates (in section 1.5) there is poor knowledge on the potential of the country's plants resources, the threats they are subjected to and how to rationally use these resources. The report indicates that conservation efforts have tended to focus on protected forest reserves, neglecting the not-insignificant diversity to be found outside of these areas.

Thus, this project contributed to filling this knowledge gap, as it was primarily designed to identify what vegetable resources were being used, how, and the threats as perceived by local communities. It has been very successful in terms of developing this local knowledge, providing a vital baseline in terms of designing strategies to conserve agro-biodiversity in both countries. The project went further in Benin by building capacity at INRAB to undertake agricultural research which can support conservation objectives. Domesticating select widely used threatened species is one approach that can support conservation, as the uptake of these species into local farming systems can lessen pressure on wild populations.

The results of the project indicate that there is good potential for incorporation of these species into farming and consumption systems, not only in rural areas, but also in urban areas through urban agriculture. However, domestication is not a swift process, and indeed, in the case of *Ceratotheca sesamoides*, which exhibits seed dormancy, there was not enough time to obtain results. In relation to the other species, there have been good results from the trials, but it will also be necessary to trial their performance in varied farming contexts.

The project recognised that lack of awareness of the value of traditional food resources and the loss of local knowledge from one generation to the other (increasingly the younger generations are shifting to what are perceived to be more "modern" and affluent diets), are big constraints in their conservation. Unless these resources are valued by communities, there is little incentive for them to be involved in their wider conservation. Through its multiple awareness-raising efforts the project has triggered an important process of recognition of the value of traditional vegetables at many levels.

Overall, the generation of a new interest in revitalising and conserving traditional vegetable species and their related knowledge has been one of the significant contributions of the project. The momentum generated has been considerable and there are good indications that it will sustain itself over the coming years, and result in projects which particularly impact on changes in the use and status of biodiversity.

It is too early to gauge the social impact of the project on the two communities involved in the domestication trials. However, farmers in Ayetedjou indicated that as well as being able to increment household consumption of *Launaea taraxacifolia* and *Crassocephalum* spp., they were profitably selling the excess in a nearby market.

4.2 Outcomes: achievement of the project purpose and outcomes

The project's purpose was to improve conservation and sustainable use of biodiversity in Mali and Benin by cataloguing indigenous vegetable (IV) species, domesticating selected species & promoting their value to producers & consumers.

In Benin the project has been successful in achieving this purpose. A key outcome has been the fact that new knowledge on the diversity, uses and threats to traditional vegetables has been made widely available to a range of stakeholders. This knowledge has been promoted through a variety of channels, and a direct outcome of this information-sharing process has been the stimulation and increase of other research and development initiatives in the country on the previously-neglected topic of traditional vegetables. For example, at the University a large PhD programme which includes four PhD students has been set up focusing on four traditional vegetables, *Sesamum radiatum*, *Justicia tenella*, *Ceratotheca sesamoides* and *Acmella uliginosa* and various undergraduate students have carried out their dissertation on this topic. More recently, the University has been included in a large consortium which has applied for EU funding to look at seed production issues and improving agro-ecological practices of selected vegetables.

Another outcome has been the interest that has been generated within INRAB for these resources. Vegetable agro-biodiversity has not been an area of work for INRAB in the past. The emerging recognition that many wild species and crops previously considered to be minor, actually play important roles in the livelihoods of Beninese villagers can be seen, for example, through the fact that various researchers have been successful in securing grants on topics related to traditional vegetables from INRAB's *Fonds Competitifs* (a grant which is open to all institutions in Benin).

These include various younger researchers who were working at INRAB, and who co-developed successful proposals with Dr. Assogba-Komlan. Ms. Honfoga obtained two successive grants to investigate "Integrating *Launaea taraxacifolia* in the management of nematodes in urban and peri-urban zones of southern Benin".

Mr. Guidi developed a successful proposal on the "Analysis of the offer and demand of two traditional vegetables in Cotonou, *Lactuca taraxacifolia* et *Ocimum gratissimum* – implications for domestication strategies of two wild harvested vegetables". This project was supposed to start in 2009, however, because of a number of general administrative issues, funding has been deferred to 2010.

Dr. Assogba-Komlan also helped Mr. Eteka and Prof. Ahohuendo from the University to prepare a successful proposal on "Investigating the possibility of domesticating two neglected traditional vegetables in Benin: *Sesamum radiatum* (*Pedaliaceae*) and *Justicia tenella* (*Acantaceae*)", which would complement the above-mentioned University research project. Dr. Achigan-Dako also from the University developed a project on the "Establishment of the genetic and phytosanitary basis to improve the production of *Citrullus lanatus* in Benin".

Furthermore, the domestication trials have provided INRAB with new knowledge relating to the potential production practices of select widely used resources, that have traditionally been harvested from the wild. The reception of these results has been by INRAB's Scientific Committee has been positive, and indeed the Committee recommended that trials with *Launaea taraxacifolia* in particular be extended to urban farm locations.

In Mali the project has partially achieved its purpose, in terms of generating new knowledge on the diversity, uses and threats to traditional vegetables. As this was a new area of research in Mali the project laid the foundations for future efforts towards promoting the sustainable use of agro-biodiversity.

4.3 Outputs (and activities)

In Benin the project fully achieved Outputs 1, 3, 4 and 5. Output 2 “Seed banks established” was achieved only in part, because the assumption that it would be possible to find seed samples of the majority of the plants identified did not hold true, and furthermore, it resulted that various of the wild species were not viable after storage. In order to maintain a viable collection of promising species for research, the partner therefore decided to establish an on-station garden, which is still being maintained.

Output 1 “Catalogue of IV biodiversity richness, uses & threats produced” has been well-received by the research community in Benin. A limited number of hardcopies were produced to be shared with key researchers and libraries, but to ensure a wider distribution the catalogue was also made available online on the project website. A link to this version has also been included on Benin’s Clearing House Mechanism website.

Output 3 “Selected highly used and threatened species domesticated” focused on four herbaceous species (*Launaea taraxacifolia*, *Crassocephalum rubens*, *Crassocephalum crepidiodes* and *Ceratotheca sesamoides*), with propagation trials set up on-station and on-farm both through seed and cuttings. Further work is needed on *Ceratotheca sesamoides* as this species exhibits seed dormancy and none of the techniques used to break dormancy were successful. For this reason, to maintain the motivation of the participating trial farmers, farmers were supported to start trials with *Justicia tenella*, another popular but increasingly rare species. The project also evaluated the seed storage behaviour of *Bombax costatum*.

The on-farm trials initially involved three villages, two in the south and one in the north. Unfortunately, it was eventually necessary to shut down activities in the village of Bognongon. Though the farmers had expressed a strong interest in attempting to domesticate select species, and it was made clear that the project was not a development project, it appears that the farmers agreed to take part with the expectation that they would receive in any case donations in cash or kind in return for their participation. When it emerged definitively that this was not the case, the farmers lost interest in the project and did not continue work on the trials.

The village had been the beneficiary of a development project, however, this information was not known when the project team visited the village to find out whether they would be interested in being involved in the trials. The lesson learned was that it is important to make specific enquiries as to a village’s previous involvement in research or development projects, as the earlier experiences may leave expectations which may not be met, and which may prejudice the project development.

Output 4 “Dissemination material and training for different stakeholders delivered” was achieved beyond expectations in Benin, as the topic of the project raised considerable interest. Thus, there was good TV, press and radio media coverage of the awareness-raising workshop, the project was invited to have a stand at a Cultural Food Fair organised by the Ministry of Culture, the project developed more radio programme sessions than envisaged, and finally the project activities were presented and discussed in the course of two episodes of the TV programme “Arc-en-Ciel” (which deals with nature conservation issues, and also healthy living).

In relation to Output 5 “Training & country-to-country expertise exchange delivered”, in the first two years there was a strong exchange between all partners, and notably Benin-Mali capacity exchange. As the project activities did not progress into the third year for Mali, the closing exchange workshop was not run, however, within Benin a stakeholder consultation workshop was organised to obtain advice on the project dissemination strategy (this event had not been envisaged in the original proposal). A notable achievement which had not been envisaged in the original project proposal, has been Mr Sognigbe N’Danikou obtaining a Masters degree from Bangor University.

In Mali, the project encountered staffing problems which unfortunately could not be addressed through the means adopted in Benin. These constraints related to the structural problem in public institutions of few tenured staff, but were aggravated by unexpected developments

(which for confidentiality reasons will not be discussed here). Under recommendation of the reviewer, the project did not progress to the third year activities. Thus, in Mali the project achieved Output 1 and part of Output 2.

4.4 Project standard measures and publications

See Annex 4 and Annex 5.

4.5 Technical and Scientific achievements and co-operation

This project has undertaken original research in two main areas.

- 1) It has collected country-wide data on the uses of plants as vegetables by different sociolinguistic groups through ethno-botanical and socio-economic surveys in Mali and Benin.
 - The ethno-botanical surveys were carried out at village level. Research tools included focus groups and botanical specimen collections. The protocols for this component were developed primarily by Dr. Enoch Achigan-Dako (Benin) and Mrs. Aminata Dolo (Mali).
 - The socio-economic surveys were carried out in a subset of the rural villages and additionally cities and market locations, using a combination of semi-structured interviews with key informants and questionnaire surveys. The protocols for this component were developed in a joint meeting by Dr. Margaret Pasquini, Mr. Alphonse Singbo, Mrs. Aminata Dolo, Ms. Rosine Azotondé and Mr. Florentin Akplogan.
- 2) It has obtained information on the domestication potential of five wild traditional vegetables in Benin. Research phases included:
 - An extensive literature review on available information relating to seed behaviour. This protocol was developed by Dr. Assogba-Komlan, Dr. Achigan Dako and Prof. Adam Ahanchede and the work was undertaken by four University students.
 - Collection of seed and plant samples of wild traditional vegetables. This protocol was developed by Dr. Achigan-Dako and Dr. Haby Sanou.
 - Studies on the seed storage behaviour of *Bombax costatum*. This protocol was developed by Dr. Achigan-Dako and Ms. Ronaldine Ahouanmagnagahou.
 - On station and on-farm trials on the seed germination behaviour in the nursery for *Launaea taraxacifolia*, *Crassocephalum crepidiodes*, *Crassocephalum rubens* and *Ceratotheca sesamoides*. This protocol was developed by Dr. Assogba Komlan and Ms. Honfoga.
 - On-station test to break seed dormancy of *Crassocephalum* spp and *Ceratotheca sesamoides*. This protocol was developed by Dr. Assogba-Komlan and Ms. Honfoga.
 - On-station and on-farm trials to determine optimum production conditions for *Launaea taraxacifolia*, *Crassocephalum crepidiodes*, and *Crassocephalum rubens* and *Ceratotheca sesamoides* This protocol was developed by Dr. Assogba-Komlan and Ms. Honfoga.
 - Trials to compare the yields of directly-sown plants versus stem cuttings of *Crassocephalum* spp. and to compare the yields of directly-sown plants versus stem and root cuttings of *L. taraxacifolia*. This protocol was developed by Dr. Assogba-Komlan and Ms. Honfoga.

In Mali the survey identified 108 species in the field, and produced a collection of 143 herbarium specimens. In Benin the survey identified 245 species belonging to 62 families

(absolute value). Estimation of species richness per phytogeographical region indicated 123 species [Confidence Interval (CI): 110 – 135] in the Guinean region, 164 species in the Sudano-Guinean region (CI: 146 – 181), and 124 species in the Sudanian region (CI: 114 – 133). Information on the uses, distribution, agro-ecology and threats has been published in the form of a catalogue. The main editors of the catalogue of traditional vegetables were Dr. Achigan-Dako, Dr. Pasquini, Dr. Assogba-Komlan, Mr. N'Danikou, Dr. Hounnankpon Yedomohan, Dr. A. Dansi and Dr. Ambrose-Oji. A draft version of the catalogue was published on the project website and researchers in Benin were invited to review it and provide feedback. The catalogue was subsequently revised based on this feedback. All botanical determinations were double-checked by Dr. Yedomohan, the botanist at Benin's National Herbarium. The catalogue is now available on line at:

http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin3.php?link_id=4

The outcomes of the trials on the domestication potential of *Launaea taraxacifolia*, *Crassocephalum spp.* and *Ceratotheca sesamoides* have been reviewed by INRAB's scientific committee. This committee meets once a year (at the end of the year in December) and includes researchers from the National Agricultural Research System (INRAB, Universities, NGO etc). Around 60 to 100 researchers attended to this committee every year. In 2008 the committee's recommendations centred around extending efforts to break dormancy and seed multiplication so that more seed would be available for urban producers and also urban households to include in their home gardens.

The ethno-botanical survey results have received peer-review feedback through various forums. In 2007 Mr N'Danikou attended and presented a project poster at a workshop organised by the World Agroforestry Centre in Bamako entitled "Agroforestry policy and research options for improving nutrition, health and livelihood of the rural poor in West and Central Africa". In October 2009, Dr. Achigan-Dako gave a presentation entitled "Estimating the diversity of traditional vegetables in socio linguistic groups in Benin" at the Second Diversitas Open Science Conference held in South Africa. Over 800 abstracts were received for this event, and the DI presentation was one of just 149 oral presentation to be accepted. Dr. Pasquini also gave a presentation in October, entitled "*Conservación de la biodiversidad de especies tradicionales de verduras en Africa del Oeste*" at a University-wide seminar at the University of Los Andes, Colombia, where she is now employed.

4.6 Capacity building

This DI project has enhanced the capacity of the host country partners through various training and human resource development activities. There have been elements of training delivered by the UK partners, but as reported in section 3, training exchanges between the two countries, and between institutions within Benin have been very significant.

In year 1 training was delivered to the field staff on the questionnaire, interview and focus group approaches by Dr. Pasquini with support from local senior scientists. This training was required in both countries to standardise the approach because of the disparate disciplinary backgrounds of the training team. In Benin, though the project counted with experienced researchers from INRAB's socio-economic unit, they were primarily economists with less familiarity with the use of semi-structured interviews and focus groups. The team in Mali were all drawn from the Fruit and Vegetable Programme. These researchers all had scientific backgrounds, and the use of social sciences research methods to complement the botanical information being collected was new. For this reason, in Mali a second training session was held in August, after review of the pilot survey results.

Dr. Achigan-Dako, a researcher working at the University of Abomey-Calavi, with work experience at Bioversity International developed a protocol and organised training on seed collection methods in Benin, and also supported the training sessions organised in Mali.

The DI project activities have built the capacity to undertake work in the area of agro-biodiversity of a new generation of young researchers, employed by INRAB.

Mr. N'Danikou for example, joined the DI project ethno-botanical surveys in 2006 as a recent graduate from the University of Abomey-Calavi. He gained considerable experience during the surveys, and by November 2007, in occasion of a visit to Mali to present a project poster at a workshop organised by the World Agroforestry Centre, he was also able to support the Malian team with some of the herbarium specimen determinations. He subsequently secured Marshall Papworth sponsorship for a place at Bangor University's MSc on International Natural Resource Development, which he successfully completed in autumn 2009. This had not been planned in the original DI project proposal. During his stay in the UK Mr N'Danikou was able to visit the Millennium Seed Bank project at Wakehurst Place and Kew Herbarium. He attended the Darwin Scholarship Programme "Monitoring and Communicating Biodiversity" in August 2009. And finally, his MSc dissertation was on a topic that was directly inspired from the DI project on the "Diversity, management and conservation challenges of indigenous vegetable and fruit species in the Fon communities of Benin". As well as being able to enhance his skills related to biodiversity research through these opportunities in the UK, at the close of his studies in Bangor, his dissertation supervisor, hired him as a consultant on an ethno-botanical project in Senegal which took place in September and October 2009, which further broadened his experience.

Ms. Juditte Honfoga has developed new research skills, specifically in the domestication component. Ms Honfoga was one of four University students who was hired as a temporary research assistant in 2007 to undertake a literature review on available information on the conditions for seed conservation of different traditional vegetables, their germination methods and seed viability. She was then hired to assist on the on-station domestication trials with *Launaea taraxacifolia*, *Crassocephalum spp.* and *Ceratotheca sesamoides*. Having observed that *L. taraxacifolia* appeared to have pesticidal and nematocidal properties, together with Dr. Assogba-Komlan she developed two protocols (funded through the *Fonds Competitifs* mentioned in section 4.2) to investigate these properties and test whether intercropping this species with *Solanum macrocarpon* (one of the major traditional vegetables cultivated on a commercial scale in Benin, which however, is very susceptible to nematodes) can defend it from pest attack.

Mr. Thierry Assogba joined the project in the third year and has been primarily involved with organising and coordinating project logistics, particularly relating to dissemination activities. He contributed significantly to the catalogue development, compiling and analysing data for Part II, species descriptions and uses.

Though the primary objective was to build the capacity of the host country institutions many younger scientists working for other institutions have benefited from the project activities and enhanced their capacity in biodiversity-related research, with the opportunity to take part in the ethno-botanical surveys and other parts of the work. Also, the training organised in September 2008 for INRAB staff on project proposal writing (this was delivered by Dr. Pasquini) and on social science research and analysis methods (delivered by Dr. Ambrose-Oji) was opened up by Dr. Assogba-Komlan to scientists from various Beninese institutions, primarily the University, but also from Bioversity International and the Municipality of Cotonou. The research community in Benin is small, and there is frequent cross-institutional collaboration. Thus the project was effectively able to reach out and benefit a wider pool of researchers at national level.

The evidence of the enhancement of the partners' capacity in this new area of research can be seen in the fact that they have been developing research proposals and projects that take forward or provide complementary research to some of the findings of the DI project (e.g. Mr N'Danikou's dissertation, Ms. Honfoga's and Mr. Guidi's projects).

The project leader Dr. Pasquini was an early career researcher who through the mentoring of her colleague Dr. Einir Young has been able to build up her skills to be an effective project partner, in proposal development and project management, including working to deadlines, monitoring project progress against milestones, preparing reports, and working with partners in a cross-cultural context. It has also strengthened her data analysis skills and her knowledge of the use and conservation issues around indigenous plant food resources.

4.7 Sustainability and Legacy

The project leaves a strong legacy in terms of detailed and new knowledge on the diversity, uses, distribution, and threats to traditional vegetables in both countries. For both countries a detailed database was developed with this information. In Benin, this knowledge has been compiled into a very detailed catalogue, whereas for Mali, an inventory document which shows the distribution of the species has been published. Both documents are available on the project website. Though the project activities could not continue in Mali because of complex and unforeseen staff availability issues, the information contained in the database will be key to re-initiate activities in the future. Indeed, the preliminary results obtained through the DI surveys were critical in establishing the thesis topic of Mrs. Aminata Dolo, who under the supervision of Dr. Kadiatou Gamby was overseeing most of the DI field activities. Mrs. Dolo is currently undertaking her PhD research based at the University of Copenhagen on the ecology, taxonomy and ethno-botany of wild melons. Once Mrs. Dolo returns to IER she will have considerable experience both from the DI surveys and from her PhD to push forward new research, building on the foundations laid by this project.

The intense efforts to promote the project activities and results has raised a lot of interest in traditional vegetables within the Benin academic community, and as mentioned in section 4.2 has triggered the development of many new research endeavours, both by researchers based at INRAB and researchers at other institutions. These projects explore aspects that were inspired by some of the project findings, but were beyond the immediate scope of the DI project. The fact that these projects were developed autonomously by the Benin researchers and have mostly been targeting (and securing) in-country funds is a good indicator of the fact that the project has been successful in generating a sustainable and genuine research momentum.

INRAB has also consolidated its reputation in this new field of research at the international scale. For example, the INRAB partner was included in two consortia bidding for grants under a recent GlobalHort call. One of these, which includes CIRAD, a Benin NGO, two partners in Kenya and one in Tanzania was successful in securing one year of funding. INRAB has three main objectives under this proposal: 1) It will contribute to increase the understanding of the indigenous vegetables and fruits that have a potential for increased local consumption, value adding and wider marketing; 2) It will contribute to collect published information and traditional knowledge, map current practices and their environmental impact as a baseline, and will then develop scenarios for potential future increased production; 3) It will develop kits providing guidelines for best production (organic production).

CIRAD is also interested in pursuing additional projects with INRAB. The organization recently hosted Dr. Assogba-Komlan for an exchange visit at their headquarters in Montpellier, France. During this visit, Dr. Assogba-Komlan presented the DI project results (presentation title: *Conservation de la biodiversité des légumes traditionnels au Bénin: quelques acquis*). There was a lot of interest in the catalogue and discussions centred around the possibility of complementing or building upon aspects of the DI work, one area of interest being the development of a project to look at wild fruit resources.

Importantly, the project has also been generating strong interest amongst non-academic stakeholders. The latter was noted, for example, from the offer of a stand to showcase traditional vegetables and the project activities at the Cultural Food Fair (alongside the stands showcasing the typical dishes of the 12 *departments*), and the invitation to take part on two occasions in the TV programme *Arc-en-Ciel*.

The legacy of the DI project has therefore been to place traditional vegetables firmly on the research and development agenda in Benin, raising awareness of the incredible diversity and potential of these resources.

As described earlier, few staff have a tenured position at either IER or INRAB. However, in Mali, most of the long-term staff working at the programme was involved in the surveys, which

increases the chances that the knowledge will be retained by the institution (though with the exception of Dr. Gamby, none of the staff held a tenured position).

In Benin the scope of the project meant that various young researchers were hired to work on different components of the project. Inevitably, some of these researchers have moved on to work in different institutions (e.g. Mr. Guidi and Mr. Avouhou), but Dr. Assogba-Komlan has been successful in retaining three of these young researchers beyond the lifetime of the project (Mr. N'Danikou, Ms. Honfoga and Mr. Assogba), as well as the two technicians who were following the trials in the villages of Ayetedjou and Ganro. Mr. N'Danikou is working 40% on a project with *Solanum macrocarpon*, and is developing a collaborative grant proposal with Dr. Assogbadjo from the University of Abomey-Calavi with new activities on conservation of traditional vegetable diversity. Mr. Assogba has been moved to a different project with the Vegetable Programme.

The domestication work initiated under the DI trials is enduring beyond the lifetime of the project. Indeed, Ms. Honfoga is continuing with on-station domestication work, and as the DI trials with *Ceratotheca sesamoides* have given partial results in Garno (mainly during the dry season), INRAB is continuing work on a small scale in this village.

In terms of resources, the DI project funded fridges and computing equipment in both countries. In Benin, at the time of the UK partner's last visit in October 2009, both fridge and computing equipment were in good working order, and will continue to be used for the activities of the Vegetable Programme (including maintaining the seed collection). The on-station vegetable garden is still being tended as the partner wishes to maintain a viable supply of seeds for future research projects.

In summer 2009, Dr. Pasquini moved on to a new position as a lecturer in Colombia, before the end of the DI project, but has continued to be involved as co-project leader (Dr. Young formally took over the leadership of the project in the closing months). The partners will undoubtedly continue to stay in touch and to seek new collaborative opportunities. Indeed, a bid for post-project DI funding has been submitted, which would bring together a broader team, involving as main contributors Dr. Young from the original UK partner, Dr. Assogba-Komlan and Mr. N'Danikou from INRAB, Dr. Achigan-Dako and Dr. Assogbadjo from the University of Abomey-Calavi, Dr. Pasquini from the University of Los Andes and Dr. Schreckenber from the Centre for Underutilised Crops based at the University of Southampton). At the time of writing of this report, the outcome of this application was not known.

5 Lessons learned, dissemination and communication

One of the key lessons drawn from the project relates to staffing constraints. In both countries the project was set up so as to include a number of tenured or long-term staff, so as to ensure a critical mass of researchers. However, over the course of a project, staff may not be available as expected, as opportunities to continue studying abroad may arise, researchers may leave the institution or they may go on maternity leave, or serious personal issues may arise. As both IER and INRAB have very few tenured staff, if named experienced participants are unable to continue being involved, it may be impossible to replace them from within the institution. There may be other junior staff available, but they may not be sufficiently experienced to take on the management responsibilities involved, and remaining staff consequently may be over-loaded.

As several of these circumstances arose at the same time in Mali, eventually staff availability constrained progress of the project. In Benin, the project leader was able to overcome any staffing difficulties that emerged in part by involving researchers from other organisations, right from the stage of proposal planning.

The lesson learned is that in countries where the academic community is rather small, though the formal partnership may involve just one institution, the engagement of researchers from other institutions for particular aspects of their expertise, is to be encouraged. This practice is good insurance in case of problems arising with internal staff availability, and it has the added

benefit of building the capacity of a wider number of researchers. A risk assessment of how to cope with such eventualities should be conducted at the proposal preparation stage.

A second lesson learned is that the championing of a well-placed policy-maker from the early stages of the project is very important, as they may be in a position to facilitate access to further funding, or to raise the visibility of the project. For most of its course, the project had the support of the cabinet deputy director of the Ministry of Agriculture, Livestock and Fisheries, Dr. Gnaho. One opportunity which the project obtained thanks to this support was the invitation to take part in the aforementioned Cultural Food Fair. Of course, the challenge is that the tenure of policy-makers and other key individuals may not coincide with the project lifecycle. Dr. Gnaho was replaced towards the end of the project, and it would have taken time to build up good relations with his successor, particularly as his successor was by training a veterinarian, and therefore less likely to be interested in the theme of the project. It is a good idea to engage with colleagues who have an understanding of the wider political environment who are alert to the possibilities of 'policy windows' where new ideas can be introduced and who can identify the relevant individuals who should be influenced.

As the project was undertaking research in a relatively under-studied area in Benin, it was considered very important to engage stakeholders at various levels so as to generate interest that would be sustained beyond the lifetime of the project. Thus, a significant component of the budget was devoted to dissemination activities.

The dissemination activities have included:

- 1) The organisation of an awareness-raising workshop, primarily aimed at bringing together policy makers and researchers to identify the priority research and development needs, based on the information from the DI and other research projects.
- 2) Development of radio programmes both at local level (Radio Ocean FM, which targets a younger audience) and at national level (Radio Immaculée). These programmes were aimed at a general audience and covered a wide range of themes, from the diversity of vegetables found throughout the country, their uses, and the specific threats, to cultivation and preparation advice for specific vegetables. The programmes included studio interviews with the DI partners, and also interventions from other experts, farmers, and the general public.
- 3) Interviews in two sessions of the TV programme *Arc-en-Ciel*, targeting a general audience.
- 4) Participation in a Cultural Food Fair in 2008, reaching out particularly to urban consumers in Cotonou.
- 5) The establishment of eight demonstration gardens in urban production sites around Cotonou. The demonstration gardens were used on a small-scale to test the reception of several traditional vegetables by the urban market, and to familiarise urban farmers with the new vegetables.
- 6) Development of information pamphlets on available cultivation advice of *Crassocephalum rubens* and *Launaea taraxacifolia*, *Solanum macrocarpon* (information for the latter has been derived from INRAB's own work), recipes and a general information pamphlet on the need to conserve the diversity of traditional vegetables in the country. These pamphlets are targeted to extension services.
- 7) Development of a comprehensive catalogue which was published online, primarily targeted at an academic audience.
- 8) Organisation on 19 village-level training workshops to disseminate the project results (including distribution of pamphlets).
- 9) A visit from the Ayetedjou trial farmers to the INRAB station and to the Houeyiho urban production site, to see the traditional vegetable gardens.
- 10) Dr Young was interviewed amongst various guests for a BBC World Food Programme episode on indigenous vegetables in Africa, and was therefore able to mention the work in Benin.

Future efforts at dissemination are envisaged, but will be primarily restricted to an academic audience.

5.1 Darwin identity

This project had a clear DI identity. It was independent and not part of any larger programme.

The DI logo has been used in various ways. It has been used on the project outputs, such as the pamphlets, the catalogue, posters and presentations. It has been used on banners announcing workshops (e.g. the opening workshop and the awareness-raising workshop).

In the course of the radio and TV interviews the partners always named the DI as the donor of the project. At the awareness-raising workshop Dr. Pasquini also gave a short presentation explaining what the DI was, how it related to the CBD, what Benin's priorities were under the CBD and how the project contributed to these thematic priorities.

Thus, the DI name will be well known within Benin, though it is primarily academic stakeholders and the policy-makers who were at the workshop who will have a good understanding of the objectives of the DI.

6 Monitoring and evaluation

The main change to the project design was the cessation of the project activities in Mali at the end of the second year, which was approved by the DI Secretariat. In Annex 2 the implication of this change are shown in the final logframe (new text has been highlighted in grey; text which is no longer applicable has been left, but has been crossed out). Furthermore, the project continued for an additional six months in Benin, to collect an extra season of domestication trial data.

The logframe based monitoring and evaluation was a useful tool, which was used to review project progress primarily during the UK partner's visits to the host countries and during the mid-term review workshop. The indicators developed at project output level were generally appropriate and useful, however, it became apparent that output 2 was only partly being achieved, since the assumption that sufficient collections of wild seeds (which would be remain viable) could be found during the seed collection missions, did not hold true. The solution to the problem of how to ensure a reliable supply of seeds for the research process, was the establishment of an on-station garden as a 'live' seed bank.

At purpose level the indicators were also generally appropriate, though the original project formulation should have included the indicator of "New IV research is being funded". There were no indicators developed at goal level, as the original DI logframe template did not require it.

However, a general reflection is that the limit to two pages means that relatively little detail can be included in the logframe, which reduces its use as a monitoring tool at project level except in a very broad sense. In effect, the project partners tended to work against much more detailed work plans, which though coherent within the overall logframe logic, spelled out more clearly the required steps, responsibilities and dates for completion. The process of monitoring inevitably evolved over the course of the project. Early work plans tended to list necessary steps that were required under each broad activity heading, with a rough timetable. By the end of the project the partners were working with more sophisticated Gantt charts to keep track of the time needed for each activity and staff availability, and reviewing budgets against the detailed steps in the activities.

As mentioned earlier, the project findings have been evaluated internally by the INRAB scientific committee and the INRAB user committee.

6.1 Actions taken in response to annual report reviews

The review of the annual reports were always shared with the project partners and subsequently discussed in the following visit by the UK partner to the country. The project has responded to all the issues raised in the reviews of annual reports in year 1 and year 2.

For the review of year 3 the reviewer commented on the need to publish in peer-reviewed journals. A paper entitled "Diversity, Geographical and Consumption Patterns of Traditional Vegetables in Sociolinguistic Communities in Benin: Implications for Domestication and Utilisation" has been submitted to Economic Botany.

In Mali, it has not been possible to progress to the stage of a detailed catalogue, as this would require substantial time inputs and there continue to be serious staff availability constraints. However, there are plans for an article comparing the survey results in the two countries.

The third query raised by the reviewer concerned the fact that not all the surveyed villages were visited in the third year to return the results. Though ideally the project would have returned to all the villages, this was not done for a combination of reasons. The major factor was the time constraint. By the time the project had some results to share in the villages, there was limited time left. Considering that the survey had covered the whole of Benin, with the prevailing poor road conditions, it was simply not possible to reach all the villages (which were actually surveyed over the course of the first two years). Furthermore, in its early plans, the project had only envisaged surveying about 18 villages in each country (which is indeed what happened in Mali) and with this number, the original project timeframe for results restitution was adequate. Benin went further than this initial plan, also because it undertook repeat surveys in the second year (in part to correct and verify species determinations). Another factor that was taken into consideration was that given the sociolinguistic diversity in the country, the species under domestication would not have been of interest to all the survey villages in any case, particularly for those of the north, who would have been primarily interested in *Ceratotheca sesamoides*. However, for the reasons given earlier in this report, the project did not reach a stage where it had usable results for this species.

7 Finance and administration

7.1 Project expenditure

Table 1 reports audited project expenditure against a revised budget for 2006/07 which was approved by the Darwin Secretariat in an email dated 6 December 2006.

The revised capital items budget included expenditure for the purchase of 1 fridge and 1 dessicator each for IER (Mali), INRAB (Benin) and AVRDC (Mali); 1 camera for INRAB; 1 laptop and printer for INRAB; 1 desktop and printer for IER; the installation of an internet connection in the project leader's office in INRAB.

However, though Dr. Assogba-Komlan started the procedure to have the line and connection installed in her office at the beginning of the project, this was not accomplished due to technical problems. On the 27th of February the project leader wrote to Mrs Okot to request carrying forward £851 to attempt to have the connection installed in the following financial year. This rollover was not approved, however, the Secretariat's suggestion was to vire part of this amount onto the travel and subsistence budget to purchase a flight for the following financial year, and then to re-allocate part of the following year's budget to enable to connection costs to be included.

There are no other variations in expenditure that are +/- 10% of the budget.

Table 1: Expenditure May 06 – Mar 07

Item	Agreed revised budget	Expenditure
Salaries (specify)		
<i>Dr. Pasquini</i>		
<i>Dr. Young</i>		
Rent, rates, heating, overheads etc		
Office costs (eg postage, telephone, stationery)		
Travel and subsistence		
Printing		
Conferences, seminars, etc		
Capital items/equipment		
Others		
<i>Secretary</i>		
<i>Survey/seed collectors</i>		
<i>Seed storing costs and maintenance</i>		
<i>General supplies</i>		
<i>Audit costs</i>		
Total		

Table 2 reports project expenditure against a revised budget for 2007/08. A request for permission to change the scope of the activities was sent to the Secretariat on 04 May 2007, explaining why it was necessary. Permission to vire was received from Margaret Okot on the 25 of June 2007 with a request for the budget implications. The revised budget was sent to the Secretariat on 01 August 2007.

Table 2: Expenditure Apr 07 – Mar 08

Item	Agreed revised budget	Expenditure
Salaries (specify)		
<i>Dr. Pasquini</i>		
<i>Dr. Ambrose-Oji</i>		
Rent, rates, heating, overheads etc		
Office costs (eg postage, telephone, stationery)		
Travel and subsistence		
Printing		
Conferences, seminars, etc		
Capital items/equipment		
Others		
<i>Secretaries data inputting</i>		
<i>Seed collectors</i>		
<i>Domestication trial assistants</i>		
<i>Casual labourers</i>		
<i>Phenological study and seed management</i>		
<i>Seed storing costs and maintenance</i>		
<i>Species identification and herbarium</i>		
<i>Domestication trial inputs</i>		
<i>General supplies</i>		
<i>Audit fees</i>		
Total		

*Real expenditure, shown in brackets, was higher because the audit fee was £1762.5. However, only the £500 contribution by Darwin has been included in the total shown in this table.

Table 3 reports project expenditure against a revised budget for 2008/09. On 22/12/08 a request was sent to the Darwin Secretariat to use part of the 2008/09 budget that had originally been envisaged for 3rd year activities in Mali, to increase the scale of the dissemination activities in Benin, and to roll the remaining unspent portion to the 2009/10 financial year, and to use this portion to extend the on-farm and on-station domestication trials in Benin to the end of the next wet season and evaluate the market value of the domesticated species. This was approved by the Secretariat.

It should be noted that the project budget in relation to expenditure was strongly affected in Benin by rapid changes in exchange rates. In the first year and a half of the project the exchange rate was around 930-940 FCFA to the pound (taking into account bank charges), but after this it started dropping. By December 2008 it was around 680 FCFA to the pound.

Table 3: Expenditure Apr 08 – Mar 09

Item	Agreed revised budget	Expenditure
Salaries (Dr. Pasquini)		
Rent, rates, heating, overheads etc		
Office costs (eg postage, telephone, stationery)		
Travel and subsistence		
Printing		
Conferences, seminars, etc		
Capital items/equipment		
Others		
<i>Domestication trial assistants</i>		
<i>Pamphlets</i>		
<i>Casual labour</i>		
<i>General supplies</i>		
<i>Domestication trial inputs</i>		
<i>Radio programmes</i>		
<i>Accountant</i>		
Total		

*Actual staff costs are shown in brackets – these were higher because of the impact of the Framework Agreement and various pay awards, however, only the costs agreed in the budget were included in the total shown in this table.

Table 4 shows the expenditure incurred in the last six months of the project against the revised budget that was approved the preceding financial year. There was an under-spend on the travel budget. This was in part because only one UK partner travelled to Benin, and in part because the on-farm trials were halted during the peak of the rainy season as the farmers indicated that they were too busy with other farming duties. This also explains the under spend on the costs related to the domestication trials. There was a slight overspend on casual labour costs, related to the on-station seed multiplication and storage. There was overspend on the printing budget in relation to the production on an additional pamphlet. Overspends were also affected by the fact that the budget was drawn up on the basis of an exchange rate of 740 FCFA, whereas in reality the exchange rate has been lower.

Table 4: Expenditure Apr 09 – Oct 09

Item	Agreed revised budget	Expenditure
Salaries (Dr. Pasquini)		
Rent, rates, heating, overheads etc		
Office costs (eg postage, telephone, stationery)		
Travel and subsistence		
Printing		
Conferences, seminars, etc		
Capital items/equipment		
Others		
<i>Domestication trial staff</i>		
<i>Casual labour</i>		
<i>General supplies</i>		
<i>Domestication trial inputs</i>		
<i>Accountant</i>		
TOTAL	-----	-----

7.2 Additional funds or in-kind contributions secured

As well as the matched funding indicated in the original project document, the partners have been successful in raising funds to carry out projects or activities that were directly complementary to the DI project objectives.

These have included:

- The funding for Mr. N'Danikou's Masters course at Bangor University (fees and living allowance).
- The two grants secured by Dr. Assogba-Komlan and Ms. Honfoga to carry out research on *L. taraxacifolia*.
- A travel grant awarded by the International Foundation for Science for Dr. Achigan-Dako to attend the mid-term review workshop in Mali in 2007.

No additional in-kind contributions were secured.

7.3 Value of DI funding

The DI project has facilitated a significant change for the host country partner institutions, as it has permitted them to combine their traditional mandate on agricultural research and development with conservation objectives. Though the countries are funding initiatives towards meeting their obligations under the CBD, a project with such an interdisciplinary approach and carried out at country-wide scale, would not have been able to secure funding from the sources which typically fund projects in either conservation or agricultural research sectors. DI funds thus enabled the host country partners to: 1) undertake country-wide ethno-botanical surveys, which constituted undoubtedly a new angle to their research; 2) in the case of Benin, to establish on-station and on-farm domestication trials with select wild harvested species which are reported to be disappearing in the natural environment, and which have great potential for introduction into farming systems; 3) to undertake awareness-raising activities to promote the value and importance of conserving traditional vegetable resources amongst a wide range of stakeholders. The DI funded the major portion of the travel and subsistence costs, personnel costs (and in particular enabling the UK staff member to devote a considerable portion of her time to supporting the project activities), trial inputs, workshops, dissemination materials. The results of the DI project have triggered a lot of interest in the Benin academic community, and have led to the leverage of new funds to conduct complementary research. Though these projects are obviously very modest, they signal a new commitment towards the conservation and sustainable use of vegetable agro-biodiversity.

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
<p>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</p> <p>The conservation of biological diversity,</p> <p>The sustainable use of its components, and</p> <p>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</p>	<p>Comprehensive list of indigenous species used as vegetables in Mali & Benin produced.</p> <p>Domestication trials of threatened species initiated.</p> <p>IV research included as a priority topic by the end of yr 3 by IER & INRAB boards.</p>	<p>The impacts of the project will not be seen for several years to come. However, by spreading information on the domestication work, in combination with the promotional activities, the project aims to revitalise the interest of consumers in these species, thereby motivating communities to conserve their resources. Furthermore, the project has been successful in stimulating various research and development activities in this new area of research.</p>	<p>(not applicable)</p>
<p>Purpose Improved conservation & sustainable use of biodiversity in Mali & Benin by cataloguing indigenous vegetable (IV) species, domesticating selected species & promoting their value to producers & consumers.</p>	<p>Comprehensive list of indigenous species used as vegetables in Mali & Benin produced.</p> <p>Domestication trials of threatened species initiated.</p> <p>IV research included as a priority topic by the end of yr 3 by IER & INRAB boards.</p>	<p>The project has made good progress towards its purpose of improving the conservation and sustainable use of biodiversity in Benin by collecting country-wide information to produce a catalogue of indigenous species used as vegetables, and setting up an on-station garden and a short-term seed bank for select species. In Mali a detailed database of indigenous vegetables and their uses in different regions has been compiled.</p> <p>In Benin the on-station and on-farm domestication work focused on <i>L. taraxacifolia</i>, <i>Crassocephalum rubens</i>, <i>C. crepidioides</i> and <i>Ceratotherca sesamoides</i>. Production advice is available for all except <i>C. sesamoides</i> which exhibits problems with seed</p>	<p>(not applicable)</p>

Project summary	Measurable Indicators	Progress and Achievements May 2006 -October 2010	Actions required/planned for next period
<p>Output 1. Catalogue of IV biodiversity richness, uses & threats produced.</p>	<p>Catalogue of IV biodiversity & disappearing species available for 6 regions in Mali & northern Benin by end yr 2</p>	<p>dormancy. The next step would be to trial these species in different farm contexts.</p> <p>In Benin activities to promote the value of traditional vegetables to producers and consumers have consisted of a high-level awareness-raising workshop, a stand in the cultural food fair, training visits to the farms, urban demonstration gardens, radio and TV programmes, and pamphlets.</p>	
<p>Activity 1. Surveys</p>		<p>The indicator for this output is appropriate, although the catalogue has been expanded to comprise the whole of Benin. The species list for Benin was published on the project website in January 2009 and the full catalogue was published in March 2009. The link to the online version was posted on the website which publishes information relating to Benin's progress towards the CBD (http://bj.chm-cbd.net/). A species list and information database for Mali was produced.</p> <p>In both countries, ethno-botanical and socio-economic data were collected at village level. Additionally, socio-economic surveys were undertaken with city consumers and market retailers.</p> <p>In Mali the survey targeted 18 villages, 3 cities and 6 markets in the six regions of Koulikoro, Kayes, Sikasso, Segou, Mopti and Gao, and was completed in Jan 07.</p> <p>In Benin the ethno-botanical surveys were carried out in 49 villages overall, and complemented with detailed socio-economic data from 18 of these villages, 3 cities, and 6 markets. The first phase of the surveys which covered 32 villages was completed in Mar 07. The second phase was completed in Feb 08, and included 14 villages in the north and 3 in the south.</p>	

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
<p>Output 2. Seed banks established.</p>	<p>Seed samples collected country-wide in Mali and Benin documented & stored in fridges in IER & INRAB & backup at AVRDC by Feb 07</p>	<p>A first batch of seed samples was collected country-wide in Benin and Mali, stored at IER and INRAB with a backup (for those samples which were collected in large enough quantities) at AVRDC in Mali. However, the assumption that it would be possible to find plants which had gone to seed did not hold true. The repeat collection missions did not significantly augment the collections. Thus, because of unavailability of seed of many species (particularly wild) at the time of the surveys, the collections represent only a small portion of the countries' biodiversity. In Benin, INRAB maintained the seed collection through on-station seed multiplication. However, as the seeds of many wild species were not viable after long storage, the partner established an on-station garden to maintain the wild plants for research purposes. The garden is still being maintained.</p> <p>The indicator was achieved (as far as it could be achieved) in March 2008.</p>	
<p>Activity 2. Seed & sample collection</p>		<p>Seed and sample collection missions were undertaken each year. In the first two years it was focused on looking for seed samples of wild species. In the last 18 months of the project in Benin it was focused on finding seed and seedlings for the species selected from the domestication trials. The INRAB partner continued to tend the on-station garden.</p>	
<p>Output 3. Selected highly used and threatened species domesticated</p>	<p>3.1 At least one species for domestication trials per region in Benin and Mali selected by Jan 07 3.2 Results from domestication trials with different field techniques available by Jan 09</p>	<p>Detailed production advice for <i>L. taraxacifolia</i> and <i>Crassocephalum</i> spp. is available, though it will be necessary to test their performance in other farm contexts. Efforts to domesticate <i>C. sesamoides</i> have not given consistent results because of very poor and unreliable germination rates, and propagation by cuttings is not successful.</p> <p>Indicator 3.1 was achieved in March and May 2007 in both countries. However, for reasons reported in previous reports, and with agreement of the DI Secretariat, the project activities for Mali relating to this output did not continue in the third year. Thus, the 3.2 indicator was only appropriate for Benin.</p>	

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
<p>Activity 3. Domestication trials</p>		<p>Domestication trials through germination tests and seed multiplication started in the wet season 2007. In Benin the work started on-station with <i>Lauraea taraxacifolia</i>, <i>Crassocephalum</i> spp and <i>Ceratotherca sesamoides</i>. Seed germination behaviour of <i>Bombax costatum</i> was studied providing the foundation for future domestication efforts.</p> <p>On-farm work started in Mali in November 2007-January 2008, through distribution of seed and plant samples which were available in sufficient quantities on station. However, as the focus shifted away to on-farm screening and seed multiplication, the trials did not continue in the third year.</p> <p>In Benin on-farm work started in Ayetedjou and Bognongon in May 2008 with the onset of the rainy season. In Ganro they started in January 2009, during the dry season with irrigation. The trials had to be suspended in Bognongon because of lack of interest by the farmers. In Ayetedjou promising results were obtained with <i>L. taraxacifolia</i> and <i>Crassocephalum</i> spp. However, in Ganro, <i>C. sesamoides</i> gave poor germination rates. As the trials were not yielding positive results with this species, the partners introduced <i>J. tenella</i> (another increasingly rare species in the area) to maintain the motivation and enthusiasm of the farmers.</p>	

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
<p>Output 4. Dissemination material and training for different stakeholders delivered</p>	<p>4.1 At least one major awareness-raising workshop delivered in both countries by Nov 08</p> <p>4.2 Pamphlets on conservation needs, cultivation techniques, preparation and recipes produced for both countries by Nov 08</p> <p>4.3 In each survey village pamphlets distributed and training delivered by Mar 09</p> <p>4.4 Three ½ hour radio programmes produced and aired by Apr 09</p>	<ul style="list-style-type: none"> ○ The awareness raising workshop was delivered in Benin in December 2008. ○ Four DI pamphlets have been produced, three on the cultivation and recipes for <i>Lauanaea taraxacifolia</i>, <i>Crassocephalum spp</i> and <i>Solanum macrocarpon</i>, and one on the need to conserve the biodiversity of traditional vegetables. ○ The village training visits took place in April 2009. ○ Two 1-hour radio programmes with Radio Ocean FM have been developed and were broadcast in April. Another 2 programmes were broadcast in May. ○ 12 30-minute Radio Immaculee programmes were developed and broadcast in the last 6 months of the project. <p>Additional outputs that were not in the original lograme comprised:</p> <ul style="list-style-type: none"> ○ Two TV sessions on the Arc-en-Ciel programme were developed and broadcast in February and March 2009. ○ Eight demonstration gardens for traditional vegetable species were set up in March 2009 in Cotonou urban production sites. ○ A project stand was set up at the national Cultural Food Fair in October 2008. ○ Mention of the project activities in Benin during the BBC's World Food Programme's episode on Indigenous Vegetables broadcast on the 14 September 2009. The programmed interviewed various stakeholders and covered various projects, and did not mention any of the donors. However, the DI name features in the caption of one of the pictures posted on their website. http://www.bbc.co.uk/programmes/b00mjk5n <p>Thus, this output has been achieved beyond the original envisaged indicators.</p>	
<p>Activity 4.1. Development of peer-reviewed publications, best practice pamphlets and radio programmes</p>		<p>In Benin the following were undertaken:</p> <ul style="list-style-type: none"> ○ Production of a catalogue on traditional vegetables. ○ Development of four pamphlets on cultivation practices and recipes and on conservation needs in French. ○ Development of radio programmes with Radio Ocean FM and Radio Immaculee. ○ Development of TV programmes with Arc-en-Ciel. 	

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
		<p>In the UK:</p> <ul style="list-style-type: none"> ○ Dr. Young was interviewed by Sheila Dillon for a BBC World Food Programme session on Indigenous Vegetables and supplied the photographs which feature on the programme's website (three of these are from Benin and Mali). 	
<p>Activity 4.2. Awareness-raising at grassroots and policy levels</p>		<p>In Benin the following were undertaken:</p> <ul style="list-style-type: none"> ○ The organisation of a stakeholder consultation workshop for advice on the project dissemination strategy on 19 September 2008. ○ The organisation of a project stand at the Cultural Food Fair on 9-11 October 2008. ○ The organisation of an awareness-raising workshop on the theme "Promotion of traditional vegetables: Strategies for conservation and sustainable use of these resources in Benin" 11-12 December 2008, attended by 45 participants (policy makers, researchers, and farmer organisation representatives). ○ Media coverage of this event through national TV, 4 radio stations, and 3 newspapers. ○ Training visits at village level to disseminate the project findings and pamphlets in 19 villages (visits were on-going in April, the end of the project year). ○ The establishment of eight demonstration gardens in urban production sites around Cotonou. ○ A visit from the Ayetedjou trial farmers to the INRAB station and to the Houeyiho urban production site, to see the traditional vegetable gardens. 	
<p>Output 5. Training & country-to-country expertise exchange delivered</p>	<p>5. Benin-Mali-UK-expertise exchange & training workshops carried out once a year</p>	<p>The country-to-country expertise between all three partners took place at the opening workshop and the mid-term review workshop. Because the project did not continue into the third year activities in Mali, the final workshop did not take place. UK-Benin expertise exchange was delivered on target.</p>	
<p>Activity 5. Capacity-building activities for partners</p>		<p>The introductory Benin-Mali-UK expertise exchange workshop took place in Cotonou, Benin, the 26-28 May (2 and ½ days). The group reviewed project objectives, discuss the relative merits of different methodologies, and formulated a detailed plan of action to carry out the activities which would lead to the principal outputs detailed in the project log frame for the first two years. Following this event, the UK partner Dr. Pasquini delivered enumerator training on the socio-economic surveys in both countries, whilst Mr Achigan-Dako from Benin supported the training process on seed collection methods in Mali.</p>	

Project summary	Measurable Indicators	Progress and Achievements May 2006 - October 2010	Actions required/planned for next period
		<p>The mid-project Benin-Mali-UK expertise exchange workshop took place in Bamako, Mali, 17-19 July 2007 (2 and ½ days). The group exchanged information and shared lessons concerning the survey and seed collection methods, and discussed improvements for future surveys and collection missions. As well as the experiences in both countries being compared, each team presented a preliminary analysis of the results of the surveys, looking at the distribution and species richness of traditional vegetables through each country and the potential to domesticate species according to farmer preferences and market demand. The group also discussed the planned and other potential dissemination approaches which could be used in year 3 and identified the preparatory steps that would need to be taken in the remainder of year 2 and beyond. Following a workshop in Mali in November 2007, Dr. Ambrose-Oji from the UK partner and Mr N'Danikou from Benin helped with the determination of the herbarium specimens collected in Mali.</p> <p>The UK partner organised training workshops for young scientists in Benin, which took place 17, 18 and 24 September 2008. Mr N'Danikou also obtained a funded MSc place at Bangor University, which started in October 2008.</p>	

Annex 2 Project's final logframe, including criteria and indicators

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: 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 <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of benefits arising out of the utilisation of genetic resources 			
Purpose Improved conservation & sustainable use of biodiversity in Mali & Benin by cataloguing indigenous vegetable (IV) species, domesticating selected species & promoting their value to producers & consumers.	<ul style="list-style-type: none"> • Comprehensive list of indigenous species used as vegetables in Mali & Benin produced • Domestication trials of threatened species initiated • IV research included as a priority topic by the end of yr 3 by IER & INRAB boards • New IV research is funded in Benin 	Research programme reports IER & INRAB board reports Successful project proposals	Mali & Benin governments maintain the same level of or increase financial support for agricultural research & allow this to be tied in to conservation measures
Outputs 1 Catalogue of IV biodiversity richness, uses & threats produced. 2 Seed banks established. 3 Selected highly used & threatened IV species domesticated 4 Dissemination material & training for different stakeholders delivered	1 Catalogue of IV biodiversity & disappearing species available for 6 regions in Mali & northern Benin by end yr 2 2.1 Seed samples collected country-wide in Mali and Benin documented & stored in fridges in IER & INRAB & backup at AVRDC by Feb 07 2.2 On-station traditional vegetable garden established in Benin to ensure supply of seed of wild species for project activities 3.1 At least one species for domestication trials per region in Benin & Mali selected by Jan 07 3.2 Results from domestication trials with different field techniques available by Jan 09 4.1 At least one major awareness-raising workshop delivered in both countries	The following information will be made available on the project web-site, which will feature the Darwin Initiative logo: Regional & country species lists & reported threats published Reports on cultivation practices published Uses & preparation manuals, recipe collections published List of seed samples collected & stored made available through the AVRDC website Domestication trial reports	Farmers are willing to cooperate with the enumerators during the survey Plants which have gone to seed can be found for seed collection Electricity supply is stable Sufficient numbers of policy makers can attend the workshops Farmers find the training sessions sufficiently valuable to attend Radio stations are interested in broadcasting the dissemination programmes Aviation and other fuel prices do not rise

	<p>by Nov 08</p> <p>4.2 Pamphlets on conservation needs, cultivation techniques, preparation & recipes produced for both countries [redacted] by Nov 08</p> <p>4.3 In each survey village pamphlets distributed & training delivered [redacted] by Mar 09</p> <p>4.4 Three ½ hour radio programmes produced & aired [redacted] by Apr 09</p>	<p>Workshop minutes & reports published (website)</p> <p>Radio programme material</p> <p>Articles published in newsletters & peer-reviewed journals</p>	<p>unexpectedly (affecting travel costs)</p>
<p>5 Training & country-to-country expertise exchange delivered</p>	<p>5 Benin-Mali-UK-expertise exchange & training workshops carried out once a year at the beginning of and half way through the project</p>		
<p>Activities</p> <p>1 Surveys</p> <p>2.1 Seed & sample collection</p> <p>2.2 Establishment of on-station traditional vegetable garden</p> <p>3 Domestication trials</p> <p>4.1 Development of peer-reviewed publications, best practice pamphlets & radio programmes</p> <p>4.2 Awareness-raising at grassroots & policy levels</p> <p>5 Capacity-building activities for partners</p>		<p>Activity Milestones</p> <p>1 Survey enumerators trained (6 in Mali, 3 in Benin) by June 06 & questionnaires agreed; surveys to identify IV species found in six regions in Mali & three in Benin, describe cultivation practices & uses & preparation of IVs completed by Mar 07; data inputting & analysis by Jul 07; data write-up by May 08</p> <p>2 Seed bank facilities established Jun 06; seed & sample collection largely completed by Feb 07 (but repeat visits may occur later depending on seed production periods)</p> <p>3 IVs for domestication trials selected in Jan 07; domestication trials begin May 07; trials for report write-up completed by Jan 09.</p> <p>4.1 Reports/peer-reviewed publication joint write-up commences May 08; pamphlets prepared by Nov 08; pamphlets distributed by Mar 09; radio programmes prepared by Dec 08; radio programmes aired Jan-Apr.</p> <p>4.2 Sourcing further funding commences Sep 07; awareness-raising workshop for policy makers Nov 08; training sessions on the need for IV conservation, cultivation techniques, preparation techniques, recipe exchanges, delivered in each survey village by Mar 09.</p> <p>5 Introductory Benin-Mali-UK expertise exchange workshops in May 06 to finalise Detailed Work Plan. Mid-term meeting in Aug 07; final summary workshop Feb 09. Partners to be in close e-mail contact through-out.</p>	

Annex 3 Project contribution to Articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	0	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	30	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	0	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	5	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	25	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	0	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	15	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	25	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts	0	Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources	0	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair

Article No./Title	Project %	Article Description
		and equitable way of results and benefits.
16. Access to and Transfer of Technology	0	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	0	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol	0	Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution	0	Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1a	Number of people to submit PhD thesis	-
1b	Number of PhD qualifications obtained	-
2	Number of Masters qualifications obtained	1 (Mr S. N'Danikou, Benin)
3	Number of other qualifications obtained	-
4a	Number of undergraduate students receiving training	-
4b	Number of training weeks provided to undergraduate students	-
4c	Number of postgraduate students receiving training (not 1-3 above)	-
4d	Number of training weeks for postgraduate students	-
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	-
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	20 (8 enumerators in Mali, 3 in Benin, 9 young researchers in Benin)
6b	Number of training weeks not leading to formal qualification	5 ½ (4 wks Mali, 1 ½ wks Benin)
7	Number of types of training materials produced for use by host country(s)	1 (pamphlets on production practices, recipes and conservation of diversity of traditional vegetables in Benin)
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	34 wks (17 Mali, 17 Benin)
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	-
10	Number of formal documents produced to assist work related to species identification, classification and recording.	-
11a	Number of papers published or accepted for publication in peer reviewed journals	1 submitted outcome not known yet
11b	Number of papers published or accepted for publication elsewhere	-
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	-

Code	Description	Totals (plus additional detail as required)
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	-
13a	Number of species reference collections established and handed over to host country(s)	2 (One species reference collection established at IER; one joint collection at AVRDC-Mali)
13b	Number of species reference collections enhanced and handed over to host country(s)	1 (One species reference collection enhanced at INRAB, Benin)
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	20 (in Benin 1 awareness-raising workshop at policy and research level; 19 village-level training workshop).
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3 (Mr. N'Danikou attended conference in Mali to present project poster; Dr. Ambrose-Oji attended DI workshop to present project poster; Dr. Pasquini presented a seminar at Universidad de Los Andes)
15a	Number of national press releases or publicity articles in host country(s)	-
15b	Number of local press releases or publicity articles in host country(s)	3 (covering the awareness-raising workshop in Benin)
15c	Number of national press releases or publicity articles in UK	-
15d	Number of local press releases or publicity articles in UK	-
16a	Number of issues of newsletters produced in the host country(s)	-
16b	Estimated circulation of each newsletter in the host country(s)	-
16c	Estimated circulation of each newsletter in the UK	-
17a	Number of dissemination networks established	-
17b	Number of dissemination networks enhanced or extended	1 (IndigenoVeg network enhanced by IER participation in 2006)
18a	Number of national TV programmes/features in host country(s)	1 (news coverage by ORTB of awareness-raising workshop in Benin)
18b	Number of national TV programme/features in the UK	2 (interviews in the programme Arc-en-Ciel in Benin)
18c	Number of local TV programme/features in host country	-
18d	Number of local TV programme features in the	-

Code	Description	Totals (plus additional detail as required)
	UK	
19a	Number of national radio interviews/features in host country(s)	12 (Benin Radio Immaculee)
19b	Number of national radio interviews/features in the UK	1 (BBC World Food Programme)
19c	Number of local radio interviews/features in host country (s)	4 (Benin Radio Ocean FM)
19d	Number of local radio interviews/features in the UK	-
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£6915
21	Number of permanent educational/training/research facilities or organisation established	N/A
22	Number of permanent field plots established	1 (Benin on-station traditional vegetable garden)
23	Value of additional resources raised for project	Ca. £110,000

Annex 5 Publications

Type *	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Newsletter article	Achigan-Dako EG and M Pasquini, M. (2007). Indigenous vegetables in West Africa: an overlooked wild resource. <i>Darwin Initiative Newsletter</i> , Issue 9.	UK Darwin Initiative	http://darwin.defra.gov.uk/newsletter/DARWIN_NEWS_9.pdf	0.00
Poster	Achigan-Dako GE, N'Danikou S, Assogba-Komlan F, Deleke-Koko I, Gamby K, Dolo A, Pasquini, M and Ambrose-Oji, B (2007). <i>Contribution of tree and shrub species to household nutrition and health in West Africa: mapping utilization and developing conservation strategies</i>	N/A	http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin3.php?link_id=4	0.00
Poster	N'Danikou S, Assogba-Komlan F, Pasquini M, Azontondé R, Ambrose-Oji B, and Achigan-Dako E. (2007). <i>Domestication as a conservation strategy for the wild vegetable resources of Benin (West Africa)</i>	N/A	http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin3.php?link_id=4	0.00
Catalogue	E. Achigan-Dako, M. Pasquini, F. Assogba-Komlan, S. N'Danikou, H. Yedomonah, A. Dansi and B. Ambrose-Oji. (2009). <i>Traditional vegetables in Benin: Diversity, distribution, ecology, agronomy and utilisation.</i>	INRAB, Cotontou	http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin3.php?link_id=4	0.00
Inventory	M. Pasquini and K. Gamby. (2009).	N/A	http://www.cazs.bangor.ac.uk/ccstudio/Research/cazsproject_Darwin3.php?link_id=4	0.00

	<i>Inventory and distribution of traditional vegetables in Mali.</i>			
Masters' Dissertation	N'Danikou, S(2009). Diversity, management and conservation of wild edible plants in the Fon community of Agbohoutogon, South Benin.	Bangor University, Bangor, Wales	Bangor University library or email: ndanikou@gmail.com	0.00
Conference presentation	EG Achigan-Dako, S N'Danikou (2009). <i>Estimating the diversity of traditional vegetables in socio linguistic groups in Benin.</i>	Second DIVERSITAS Open Science Conference 3 – 16 October 2009, Cape Town, South Africa http://www.diversitas-osc.org/index.php?page=oral_papers	Abstract available from: http://www.diversitas-osc.org/docs/Abstract%20intreactive%20final.pdf Email: dachigan@gmail.com	0.00
Journal Article	Achigan-Dako EG, N'danikou, S, Assogba-Komlan F, Ambrose-Oji B, Ahanchede A, and Pasquini MW. Diversity, Geographical and Consumption Patterns of Traditional Vegetables in Sociolinguistic Communities in Benin: Implications for Domestication and Utilisation.	Submitted to Economic Botany		

Annex 6 Darwin Contacts

Ref No	15-003
Project Title	Conservation of Biodiversity in Traditional West African Vegetable Species
UK Leader Details	
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