



**Darwin Initiative/D+ Project  
Half Year Report  
(due 31<sup>st</sup> October 2019)**

<b>Project reference</b>	24-029
<b>Project title</b>	Enabling Baka attain food security, improved health and sustain biodiversity
<b>Country(ies)/territory(ies)</b>	Cameroon
<b>Lead organisation</b>	Manchester Metropolitan University
<b>Partner(s)</b>	Zerca y Lejos (ZyL), CIFOR
<b>Project leader</b>	Prof. John E. Fa
<b>Report date and number (e.g. HYR3)</b>	30 Oct. 2019, HYR3
<b>Project website/blog/social media etc.</b>	

**1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).**

**General comments**

The following narrative follows the agreed baseline timetable for the project. Here, we also report progress on the outputs. In this half-year report we summarise activities undertaken during the reporting period. In this document, we will refer to the five general outputs expected from this project, as adapted following the Darwin Initiative Mid-Term Review carried out in March 2019. We also annex our responses to our Y2 annual report to this document

The strategic goal of this project is to improve the livelihoods of 10 marginalised Baka communities in southern Cameroon (Annex 1) by supporting them in managing their food resources (wild and domestic) in a sustainable and practical manner. During the first two years of the project our aim was to generate baseline data (with full participation of the communities themselves) on the use of domestic crops and wild foods to determine their importance in meeting the nutritional needs of the target population.

We have also assessed the human health status of villagers to assess levels of malnutrition and disease, and establish possible links with their food supply. Simultaneously, we have trained community members on improved agricultural techniques. In the last year of the project we are working with all 10 communities to understand traditional ways of resource use and how these relate and interact with established formal rules and legislation.

All elements of data collection and community engagement activities within the project are fully aligned to achieve our main strategic goal. Each component is a stepping stone towards delivering the key benefits of the project.

**Team composition and collaborations**

We continue with our full Darwin field team without any changes.

Although the core team and its activities have not changed we have initiated collaborations with different organisations and individuals to support the aims of our project. Thus, here, we give updates on Y2 collaborations that have continued into the first half of Y3, as well as new ones started during the latter period. Further details of Y2 collaborations started can be found in the annual report for that year. Our collaborative work brings together people who possess different skill sets and backgrounds to the table and are able to provide our project with new valuable insights.

While it is our intention to create synergy, where possible, with local and international scientists and other professionals, all potential collaborations are first discussed for approval by our Darwin team. We then examine the time and resources new collaborations may require from us, and whether they add to our project. More importantly, no collaboration is entered upon if they impinge directly or indirectly on the functioning of the Darwin project.

*i) Traditional use of medicinal and food plants by the Baka project*

An ad hoc team from University of Bertoua in Cameroon has carried out this work, with Darwin funds originally designated to cover time for a Data Analyst<sup>1</sup>.

The main aim of this work is to understand the role that plants play in the lives of our communities. This aspect of biodiversity use in the region was not originally contemplated in our project, but we felt it was essential to fill this knowledge gap, to complement information gathered on wild animal use. By engaging local scientists, we also deepen our collaboration links within the country.

A first report will be completed by the end of October 2019, comprising inventories and categorization of Non-Timber Forest Products (NTFPs) used by communities for food, service and medicinal purposes. All gathered specimens (350 species identified) have been identified in the National Herbarium in Yaoundé.

Although we had planned to carry out commodity chain analyses of all NTFPs (plants and animals) during a second phase, we considered it more appropriate to concentrate on how our communities use plants by: 1) quantifying volumes of the different plant species harvested per household, 2) describing exploitation techniques used, and 3) identifying community interest and activities around the sustainable use and conservation of plant NTFPs.

Following discussions with Prof. Jean Lagarde Betti, a group of three PhD students from the University of Douala (who already took part in phase 1, see Y2 annual report), with support from our in-country team commenced fieldwork activities on 15th October 2019, in three sample villages (Assok, Doum and Nkolemboula). Fieldwork will end in mid-December 2019. FGD will be held during February 2020. Meetings with communities were appropriately held before the start of the work in order to maintain a rigorous FPIC and identify households willing to participate.

*ii) Baseline survey of agricultural production and activity*

Although we reported that a contract with the Institute for Tropical Agriculture (IITA) was reported in our Y2 annual report, after discussions with IITA we decided to work with the NGO Tropical Forest and Rural Development (TFRD), given their expertise and previous work in our study area. This activity has been carried out with funds allocated to CIFOR-Cameroon in our original budget<sup>2</sup> and is still in progress. A first phase, a period of 15 days, was undertaken in July 2019, and the second phase was conducted during September 2019.

The main aim of this activity was to understand the type of agriculture practiced by our Baka communities, but engage with them to determine ways to decrease the ecological impact of

<sup>1</sup> After discussions with MMU and Darwin office, we agreed to use these funds to engage local researchers to explore use of plants.

<sup>2</sup> Although we had originally intended CIFOR-Cameroon to do this work, their suggestion was that we should engage IITA. We contacted MMU and Darwin so that funds allocated to CIFOR-Cameroon in our project could be transferred to another more appropriate collaborating organisation.

slash and burn. We focused on: 1) describing local farming practices, crops planted, economic dependence, risks and challenges facing the communities, 2) proposing practical actions to improve farming practices to achieve a more sustainable system and 3) providing a clear way to evaluate the proposed interventions.

In the first phase, we worked with a total of 27 farmers in 52 fields (12 in Akom, 7 in Assok, 12 in Bemba, 8 in Nkolemboula and 12 in Doum); a total 36,393 ha (13,726 ha in Akom, 3,183 ha in Assok, 8,438 ha in Bemba, 2,897 ha in Nkolemboula, and 8,149 ha in Doum). We collected data on: 1) type and association of crops; 2) GPS location of fields; 3) Field sizes; 4) Field ownership and 5) Distance between the fields and the main road. We also interviewed farmers to determine whether type of ownership of the fields (whether owned, inherited or rented), the level of maintenance of the fields, as well as further details on agricultural practices and annual cycle of the different farming activities.

A second phase of work was conducted during September 2019 to assess farmers' perception of agricultural performance and challenges. We organised Focus Group Discussions (FGD) with a total of 72 participants (out of which almost half were women) in three sample villages of Doum, Bemba and Akom (Table 1).

**Table 1.** Number of women, men and young persons participating in the agricultural production activity study.

Village	Total	Number of women	Number of young people	Number of men
Doum	28	13	5	10
Bemba	13	5	1	7
Akom	31	12	2	17
<b>Total</b>	<b>72</b>	<b>30</b>	<b>8</b>	<b>34</b>

We also held meetings with local authorities in four different ministries [Ministry of Agriculture and Development (MINADER), Ministry of Social Affairs (MINAS), Ministry of Women's Empowerment and the Family (MINPROFF) and the Ministry of Decentralization and Local Development (MINDDEVEL)] to determine the existing current policies affecting local agriculture.

A full report compiling will be completed at the end of October 2019.

*iii) Hunted species: Reproductive biology and lead contamination*

We continue discussing with our colleague Dr. Pedro Mayor from the University of Barcelona the possibility of supporting fieldwork on reproductive cycles of hunted species. Understanding reproductive cycles of hunted species in our study area can allow us to better determine the impacts of hunting, as our team has shown for other parts of tropics<sup>3</sup>.

We are also looking at furthering a project with Dr. Mayor to determine lead levels in hunted species within our study area. A major source of lead (Pb) in the environment comes from the discharge of lead-based ammunition; posing health risks posed to humans and wildlife. Following research in the Amazon that shows that the high average concentration of lead in livers from wild game is comparable to lead levels in industrialized countries and mining areas<sup>4</sup>, we consider that collaborating with Dr. Mayor would allow us to understand this potential risk to tropical wildlife and local communities that rely on subsistence hunting.

Given our commitments to finalising the Darwin project, we contemplate supporting Dr. Mayor's

<sup>3</sup> See for example: El Bizri, H.R., Fa, J.E., Bowler, M., Valsecchi, J., Bodmer, R. & Mayor P. (2018). Breeding seasonality in the lowland paca (*Cuniculus paca*) in Amazonia: interactions with rainfall, fruiting, and sustainable hunting. *Journal of Mammalogy* **99**, 1101–1111.

<sup>4</sup> Cartró-Sabaté, M., Mayor, P., Orta-Martínez M. & Rosell-Melé, A. (2019). Anthropogenic lead in Amazonian wildlife. *Nature Sustainability* **2**, 702–709.

team in facilitating the collection of reproductive and vital organs of hunted carcasses arriving in one of our study communities. Due to the number of biological samples required for this study and the time left of our Darwin Project, we decided to only proceed with facilitating the collection of livers. We will look for ways of carrying on with this work alongside the continuation of the initiatives launched by the Darwin project.

## **Brief description of progress**

### *i) General*

Our project has been designed to ensure that the evidence obtained can enable us to address our strategic goal as logically and unambiguously as possible. Outputs 2-4 have been implemented during Y1-Y2, and a significant amount of information has been gathered on: 1) wildlife resources available and use by our communities; 2) overall health and nutritional status of these communities; 3) prevailing socioeconomic conditions; 4) agricultural practices and domestic food supply.

The research design we have applied, although complex, has allowed us to determine the baseline situation for our 10 Baka communities since no data were available on any of the above topics. These data are fundamental to assess whether our involvement is and will make a significant positive impact on the way of life of these communities.

Our current task is to complete all data curation and analyses so as to present our results to all stakeholders by the end of the project. However, we make it a point of presenting (and discuss) our findings with different stakeholders and colleagues as information is gathered and processed (see meetings section below).

### *ii) Data gathering activities undertaken during this reporting period*

#### *Food consumption and nutrition surveys*

By mid-May 2019, the second phase of 24h-recall surveys was completed in five villages (Meyos, Odoumou, Akom, Adjap-Mintom and Akonetye). A total of 36 24-h recalls were performed in these villages, with an average of 75% participation rate.

During June and July 2019, we completed the nutritional database containing all data collected through 24h-recall diet recalls, during which participants are asked to recall all food and drink they have consumed in the previous 24 hours. To estimate amounts of each food item consumed in a household we collected weights of all food items eaten. These data have been curated, stored electronically in the project's Google Drive, and will be used in the assessment of dietary and nutritional intake of our Baka communities.

We plan to complete all dietary analyses by the end of 2019, with the assistance of Mrs. Fernanda Lacerda, dietitian at the Jersey Hospital<sup>5</sup>. With her support we will describe daily eating patterns, including specific foods and nutrients consumed and their relative quantities. We have access to an extensive database of nutritional contents of commonly consumed food items as well as cloud-based nutritional software to aid in the quantitative analyses.

We are in regular contact with Mrs. Lacerda and held an online meeting with in August 2019 during which we looked over the gathered data, assessed their quality and explored potential nutritional analysis. We continue working with Mrs. Lacerda and further advice will be forthcoming from Dr. Amy Ickowitz (CIFOR) and Prof. Barrie Margetts (Southampton University), as mentioned in our Y2 report.

#### *Household, hunter and fisher surveys*

<sup>5</sup> The Project Leader, who resides in Jersey, initiated contact with Mrs. Lacerda. The Project Leader will communicate and work with Mrs. Lacerda to complete the analyses contemplated.

Information on the socioeconomic status of our communities in terms of income, wealth and assets will be used in our assessment of their poverty levels. Between April and October 2019, we completed another 45 household surveys. Alongside the household surveys undertaken in Y2, we now have a total of 113 completed surveys.

We have also undertaken a further number of hunter and fisher surveys to understand perceptions with regards to hunted animal foods and fished animal foods. We performed another 40 hunter surveys during this report period; we have a total of 110 hunter surveys and 61 fisher surveys.

We have done some preliminary analyses of these data so as to guide our project's progress, but final analyses and preparation of outputs will be completed by the end of the project.

### *Hunter offtake*

The offtake database, comprising information on all animals hunted by our participating Baka hunters in each of our 10 study villages, has now been finalised and readied for analysis. We are currently working on the analyses of these data. Preliminary results of species hunted and extraction levels and importance of wild meat to our communities was presented in our various stakeholder meetings at the end of 2018 and during 2019 (see meetings section). Further analyses and preparation of outputs are being currently undertaken.

### *Hunting spatial data*

A clear innovation in our project has been the use of wrist-held GPSs which a sample of hunters voluntarily carry during their hunting trips. This information has allowed us to determine areas of importance for hunting of wild meat for our communities. All spatial data gathered have been compiled and errors identified and resolved. Further analyses are being performed in ArcGIS 10.5. Duration and distance covered in all hunting trips will be contrasted with offtake data for each, so as to determine hunting efficiency by hunter and hunting trip. These results will allow us to determine the hunting potential of the lands used by our communities.

We have currently completed analysed 136 successful tracks from five villages (Doum, Adjap, Akom, Akonetye and Meyos) and work remains to be done for the remaining five villages.

### *Camera trapping*

Our camera trapping survey undertaken in Y2 was performed within hunting areas used by the communities. Our intention was to determine the status of large-bodied animals (mammals and birds) to assess the level of faunal depletion in the region. An MSc student, under the supervision of Dr. Bradley Cain, is currently analysing all images at MMU with input from Dr. Martin Jones (MMU) and advice from Dr. Rajan Amin (ZSL). We plan to have all analyses completed by the end of 2019.

We have decided not to undertake further camera trapping in the study area. The main reason is the time and resources that another five trapping grids would require. Nonetheless, the spatial and temporal coverage already achieved will allow us to determine what species occur as well as the relative abundance of some species. A preliminary species list for our study area indicates the presence of threatened mammals (chimpanzees, mandrills, yellow-backed duiker, giant pangolin), and not dissimilar to the number of species found in the adjacent protected area, the Dja Faunal Reserve<sup>6</sup>, implying our area is possibly undepleted. More detailed numerical comparisons between our area and the Dja will be undertaken. We aim to publish these results with our MMU team. A first draft of a paper is planned for the start of 2020.

<sup>6</sup> Bruce, T., Amin, R., Wacher, T., Fankem, O., Ndjassi, C., Ngo Bata, M., Fowler, A., Ndinga, H. & Olson D. (2018). Using camera trap data to characterise terrestrial larger-bodied mammal communities in different management sectors of the Dja Faunal Reserve, Cameroon. *African Journal of Ecology* 56, 759-776.

### *iii) Identification of traditional decision-making and rules around hunting*

An important aim within our project to establish agreements with communities that ensure the implementation of sustainable hunting practices through traditional hunting governance systems - rules and decision-making processes that are in place to manage hunting activity.

For this purpose, we developed an exhaustive semi-structured interview form to apply in the different communities through Focus Group Discussions (FGD). The aim of this exercise is to record communal rules and customs that have been traditionally followed by the Baka communities (and their current validity) regarding hunting rights, hunting grounds, hunting techniques, prey selection, harvest distribution, hunter status, conflict resolution and punishment systems as well as hunting cultural values and taboos, among others. This exercise serves two purposes: 1) it provides us with a clear foundation on which to base more robust, culturally appropriate agreements with our communities, and 2) it helps the community acknowledge collectively their traditional governance system.

After completion, the survey form (available on request) was reviewed by various. We then field-tested it on a sample of 5 hunters in September 2019. Because of its length we decided to apply shorter questionnaires disaggregated by gender and age groups. In this way, we are able to document differences in perceptions and knowledge between women and men, and amongst the different generations.

FGDs will consist of 6-10 people led through an open discussion by a moderator. Discussions will be in the local language (Baka and/or Fang), recorded ad libitum, and later transcribed and translated into English and French for further analysis.

A first round of community meetings was held to socialize this part of the project. During these meetings we explained our objectives and also obtained consent of the communities to launch data collection. We started FGDs in December 2019 and plan to complete these by February 2020.

### *iv) Implementing farm schools*

Within the project, we have launched farm schools, locally termed *École Populaire de la Terre* (EPT), where villagers can learn topics related to their daily lives, such as cultural and traditional values, land use, social and political issues, but also engage in agricultural training programs (Annex 2).

The basis of our farm schools lies around the concept of agroecosystems. An agroecosystem is the basic unit of study in agroecology, defined as a spatially and functionally coherent unit of agricultural activity, and includes the living and non-living components involved in that unit as well as their interactions. In endorsing this concept, our project promotes the use of agricultural practices that include the growing in association cash tree crops (e.g. cacao) alongside annual subsistence crops. Alongside providing land for practical work, farm schools create a physical and symbolic space for meetings and discussions not only around agriculture but also about issues of territory, policy, traditional rules and local problems. As an example, we witnessed a discussion among local hunters often hired by poachers where they shared their concerns regarding the illegality of their activity and the risks that implies.

Farm schools were launched in the five villages. A total of 111 villagers (51 men/60 women) are currently taking part (Table 2). Fields used for training purposes were leased within a clear collaborative agreement signed between the Darwin project/ZyL and each community. Participants and Darwin project/ZyL facilitators prepared each training field, and organised a participatory calendar.

**Table 2.** Number of Baka villagers participating in farm schools, per village.

	Akom	Assok	Bemba	Doum	Nkolemboula
Women	13	17	13	12	5
Men	12	14	12	9	4
Total	25	31	25	21	9

Each training field has a mean surface area of 1250 m<sup>2</sup>, though some fields are larger. Workshops are held in these training fields once a month in each village. These workshops use a participatory and interactive approach that focuses on the resolution of farmers' problems and practice-based learning. All workshops are guided by written documents around 8 teaching modules. As part of the practical work undertaken during the workshops, participants implement a simple planting and harvesting regime that ensures the nutrient recycling in the soil, thus preventing the need of further forest clearing.

By improving agricultural standards in our target communities through nutritionally adequate household-scale agriculture, we strengthen food security (enhanced access and stability), not only by providing enough agricultural produce to consume but also a surplus to sell, acting as security net during lean periods. This is important both in poverty alleviation but also has implications in lessening pressure on wildlife, since hunting animals for sale remains the only income-generating activity for these communities in the absence of surplus agricultural products to take to market. Thus, by enhancing agriculture in families that also hunt, our project can improve conditions for them to produce agricultural to sell, which in turn will take away the emphasis on selling wild meat. The impact of improved agriculture is likely to be significant given that between 57% and 100% of hunters in the five villages were directly or indirectly involved in the EPT (Table 3).

**Table 3.** Numbers and the proportion of hunters who have participated in our offtake study that are also involved in the EPT, by village.

	Akomi		Assok		Bemba		Doum		Nkolemboula	
	No.	%	No.	%	No.	%	No.	%	No.	%
% hunters personally involved in EPT	4	44%	7	50%	12	46%	6	50%	3	21%
% hunters indirectly involved in EPT	5	56%	3	21%	57	27%	2	17%	5	36%
% hunters directly/indirectly benefitting from agriculture	9	100%	10	71%	19	73%	8	67%	8	57%

#### v) Promoting the creation of local farming cooperatives

Alongside direct agricultural support provided by our project with ZyL, and farm schools, more recently we have worked in promoting the creation of cooperatives among farmers in the five participating communities, as shown in Table 3. At the start of each agricultural campaign, our project also supplies a grant to support farmers' individual projects. Given that farmers are organised within cooperatives, the grant is managed by the *bureau's* group and distributed according to individual and common needs.

**Table 3.** Cooperatives created in the five villages which participate in the Darwin/ZyL

agricultural support programme.

Villages	Group Name	Type*
Doum	Bouma Bo Pwode	GIC (Group d'initiative Communautaire)
Assok	Abatomanie	Association
Akom	Toni Pweke	Association
Nkolemboula	Djoko	Association
Bemba	Ngassa Mao Te Naje	Association

\*These categories are chosen by the group itself and do not entail any difference other than a symbolic meaning.

Within these cooperatives the following activities have been undertaken:

#### *Implement community savings and the management of economic resources*

The *tontine* is an association of people who hold meeting periodically in order to pool their savings to be able to cope with particular or communal problems collectively. Participants regularly pay a fixed contribution to a pooled fund. In this case, two of our five communities have already started to organise themselves to pool their savings with three different objectives: a) to pay for health emergencies, b) for individual savings and c) for common needs.

#### *FPIC*

In order to better implement the FPIC, a number of meetings were held to improve the communication between communities and Darwin/ZyL. For that purpose, a mobile phone was provided to a member chosen by the group to be in charge of communications. During these meetings, decision-making systems within the group were also agreed. From November 2019, we will erect sign boards in each village to be used as a space to put up notices such as information on upcoming meetings, administration reports, agricultural innovations or other news that may be of interest to the community.

#### *Seed banks*

Seed bank provide a communal system of seed storage that can be used during lean seasons, individual crop loss and/or low-yielding agricultural campaigns. It works as a bank where each member loans/lends a part of their harvest at the end of a campaign to be stored communally at a store. It is the group itself who decides the amounts share, who and how to manage the stock and how to loan seeds to a new member. At the moment, the groups are agreeing on the set of rules to rule the functioning of each seed bank and readying the material for the construction of the store.

### **Communications**

#### *Presentations*

*University of Málaga: 'Indigenous Peoples in the Congo Basin: Lives and future' seminar. PhD and MSc in Biodiversity and Environment (31<sup>st</sup> May 2019)*

At the end of May 2019, several members of the Darwin project team (JEF, GRB, EAM) held a meeting in Málaga (Spain), where they had the opportunity to give a seminar titled 'Indigenous peoples in the Congo Basin: lives and future' for both PhD and MSc students (Biodiversity and Environment MSc) of the University of Málaga. This seminar presented some preliminary results of the Darwin project, including interesting round-table discussions among fellow researchers and students.

*Congo Basin Institute: 'Resolving Conservation Conflicts around PAs in Central Africa' conference (7<sup>th</sup> - 11<sup>th</sup> October 2019)*



The BFS team was invited to the conference 'Resolving conservation conflicts around PAs in Central Africa', organized by the Congo Basin Institute and the University of Gottingen in Yaoundé (Cameroon) between the 7<sup>th</sup> and the 11<sup>th</sup> October 2019. The team contributed with a presentation on the BFS Darwin Initiative, providing an insightful example of community-based conservation that was highly welcome by the audience and brought about an interesting discussion about the involvement of indigenous people's rights, knowledge and interests within the frame of ICDPs (Integrated Conservation and Development Projects).

*Interaction with COP members*

Regular but informal contact with a number of our Community of Practice (COP) members (see Y2 annual report) have been commonplace, often through WhatsApp or Skype, to update them of our progress. In particular, we have been close touch with organisations such as Forest Peoples, ZSL and Center for Environment and Development, who work in our study area.

*Reporting to government entities*

Regular reports have been sent to the following national and local authorities:

- Délégué Départemental du MINFOF du Dja et Lobo
- Ministre des Forêts et de la Faune (MINFOF)
- Ministre de la Recherche Scientifique et de l'Innovation (MINRESI)
- Préfet du Département du Dja et Lobo
- Sous-Préfet de L'arrondissement de Djoum
- Sous-Préfet de L'arrondissement de Mintom

**2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.**

No notable problems to report.

**2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?**

Discussed with LTS: Yes/No

Formal change request submitted: Yes/No

Received confirmation of change acceptance Yes/No

**3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?**

Yes  No  Estimated underspend: £

**3b. If yes, then you need to consider your project budget needs carefully.** Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate

changes if necessary.

**4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?**

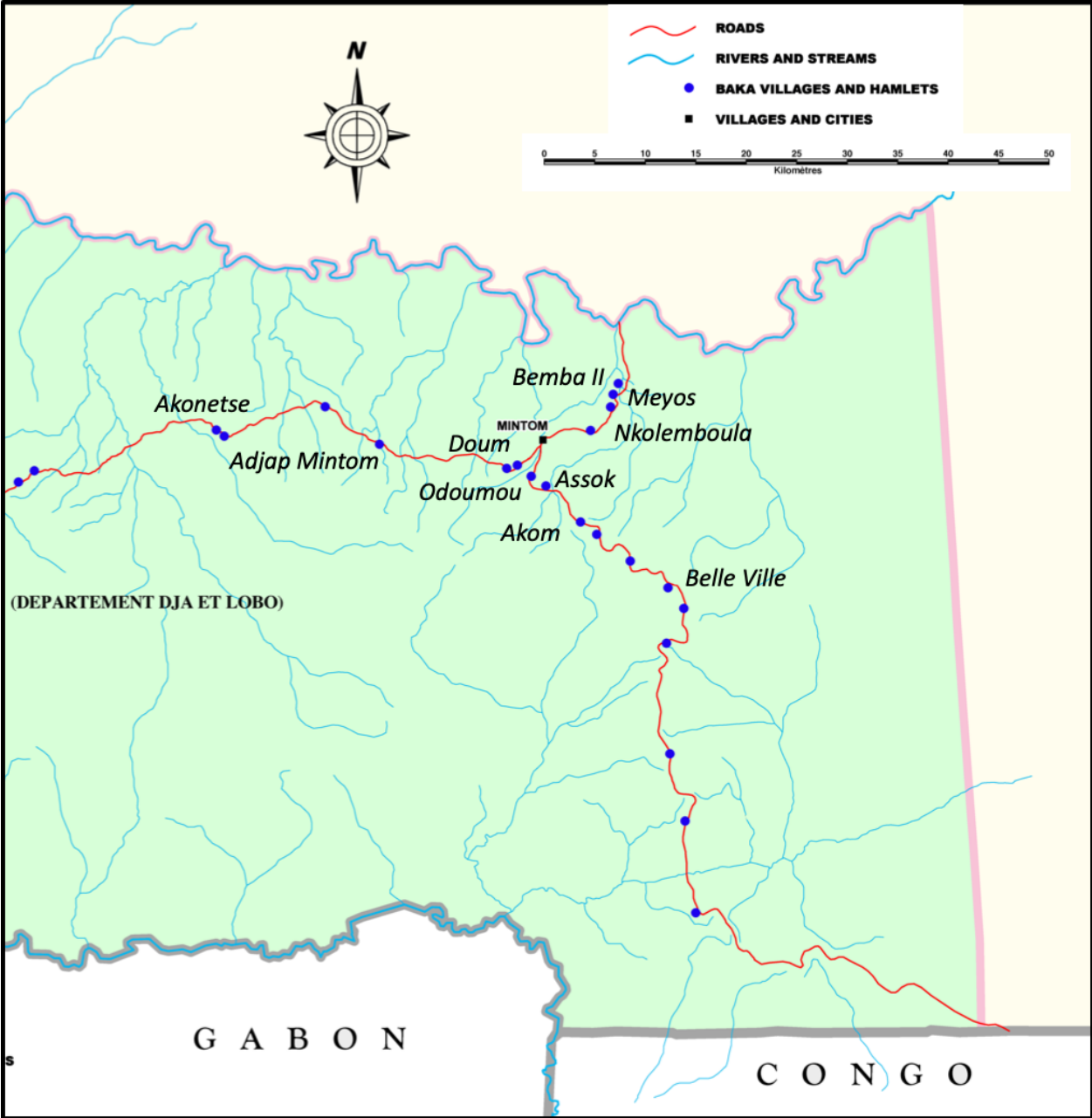
None

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document. Additionally, if you were funded under R25 and asked to provide further information by your first half year report, please attach your response as a separate document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also** be raised with LTS International through a Change Request. **Please DO NOT send these in the same email.**

Please send your **completed report by email** to [Darwin-Projects@ltsi.co.uk](mailto:Darwin-Projects@ltsi.co.uk). The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-035 Darwin Half Year Report**

Annex 1. Map of Darwin project area showing all localities mentioned in the text.



**Annex 2. Photos of farm school participants.**



