

## **Final report:**

### **USAID/Nigeria presentation of the ENCAP Africa Regional Course in Environmental Assessment and Environmentally Sound Design for Small-Scale Activities**

**4–8 November 2002 ■ Abuja, Nigeria**

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**Date:** 23 December 2002

#### **Attachments:**

Key contacts  
Participant List  
Final Agenda  
Final case site descriptions  
Case site itineraries  
Final Budget (hardcopy distribution only)  
Participant evaluations (hardcopy distribution only)

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#### **Summary**

In October 2002, USAID/Nigeria contracted with Tellus Institute to organize and conduct a presentation of the *Africa Regional Course in Environmental Assessment and Environmentally Sound Design for Small-Scale Activities*.

The course was held in Abuja from 4–8 November 2002. Course participants were a mix of USAID/Nigeria partners and potential grantees, USAID staff, and professionals from Nigerian Government ministries and agencies.

The principal trainer for the course was Mark Stoughton of Tellus Institute. Tellus contracted with Savanna Conservation Nigeria, a Nigerian NGO, to provide logistics support to the course. Yakubu Dalhat was the SCN project lead. Tellus also contracted with two Nigerian experts to provide Nigeria-specific socioeconomic and environmental expertise.

The original venue for the course was Bauchi, Nigeria, with case study sites in and around Yankari National Park. Savanna Conservation Nigeria was chosen as logistics coordinator because of the organization’s on-the-ground activities in this area and its detailed knowledge of local conditions. Approximately two weeks before the course date, USAID/Nigeria made the decision to change the venue to Abuja, based on new security concerns raised by the US Embassy. Intensive effort on the part of USAID’s Nduka Okaro, Tellus and SCN, and the generous cooperation of the FCT (Federal Capital Territory) office of the Agricultural Development Project (a parastatal agricultural extension organization) enabled a new training venue and case sites to be chosen in the several days before the course, and a necessary contract modification to be completed.

Despite the difficulties attendant to the venue change, participant evaluations gave the course high marks—4.41 out of 5 for quality of content; and 4.34 out of 5 for the degree to which the course improved participant understanding of environmental assessment.

This memorandum serves as the final report of the Tellus Institute consultants on the course and the delivery process. As such, it constitutes the final deliverable specified under Tellus’ scope of work. It documents:

- The general nature of the basic course, and the substantive adaptations and additions made for this presentation.
- Key attributes of the course
- Consultant’s evaluation of the course

Attachments to this memorandum provide additional information and documentation, including the list of participants and participants’ evaluations.

### **Course description**

The course was a presentation of the “Africa Regional Course in Environmental Assessment and Environmentally Sound Design for Small-Scale Activities.” This basic course is described immediately below, with the adaptations made in Nigeria described at the end of this section

**The basic course** is a 5-day (M-F) course for 25–50 participants. Typically targeted at USAID partner organizations engaged in small-scale activities, it provides an introduction to environmentally sound design with application to key sectors, and to compliance with USAID environmental review requirements (Reg 216 and associated directives). It is not intended as advanced technical training in impact assessment.

The course is centered around a set of case studies; day 3 consists of a one-day field trip in which participants conduct observation and assessment of actual or proposed project sites. Participants then write a draft IEE or environmental review based on their site visit experience. Typically more than one project site is identified for each of a few sectors (e.g., use of agrochemical inputs, small scale irrigation, agricultural micro and small enterprises, roads, etc.)

The course has been developed by staff of USAID’s Africa Bureau and Tellus Institute. It has been given 22 times since its creation in 1995. Course development has been funded by ENCAP, an African environmental capacity-building initiative of USAID’s Africa Bureau. As the lead provider of technical assistance under ENCAP, Tellus Institute—a non-profit environmental research and consulting organization—typically conducts preplanning and materials preparation as well as providing principal course trainers. This was the first presentation of the course in Nigeria.

A full description of the course, agenda and course materials, as well as a database of past participants, is available at <http://www.encapafrika.org>

**Adaptations.** The basic course is typically delivered to USAID partners (i.e., organizations receiving grants or funding directly from USAID) and focuses on USAID-specific environmental procedures. However, the audience for this course was majority non-partner. For all participants, knowledge of environmental review processes for undertaking small-scale development activities was important, but for many, specific understanding of USAID Regulation 216 language was not essential. Therefore, the course taught general environmental review procedures (based on USAID/AFR’s procedures for environmental review of subgrant projects) as well as Nigerian EIA procedures. USAID’s Regulation 216 procedures were taught in a separate, optional session.

### Key attributes of the USAID/Nigeria course

<b>Dates</b>	Monday, 4 November–Friday, 8 November 2002
<b>Venue</b>	Crystal Palace Hotel, Abuja  <b>Note:</b> The venue was originally to be Zaranda Hotel, Bauchi State, Nigeria. This venue was chosen for its proximity to the high concentration of small-scale development activities being supported by Savanna Conservation Nigeria in areas adjacent to, and within, Yankari National Park. Approximately two weeks before the course, USAID changed the venue to Abuja due to new security concerns raised by the US Embassy.
<b>Participants</b>	38 Participants attended the course. (This figure excludes short-term visitors, officials, and speakers.)  Participants were distributed as follows:  Nigerian experts..... 2 Tellus Lead Trainer ..... 1 Logistics Coordinator ..... 1 USAID/Nigeria staff..... 5 USAID–other missions..... 2 Nigerian Government..... 9 USAID Partners ..... 5 Other NGOs..... 13  A full participant list is attached to this report  It should be noted that a number of the Abuja-based participants did not attend for the full course.
<b>Participant support</b>	USAID/Nigeria provided full transport, lodging and M&IE per-diem support to invited non-USAID/non-Partner participants based outside Abuja (15 individuals). A modest travel stipend was provided to those commuting to the course from the Abuja area.
<b>Course materials</b>	The participant’s sourcebooks (ap 500 pages, including all course presentations and background readings) were reproduced in the US by Tellus and brought to Nigeria as accompanied baggage.

<b>Agenda</b>	The course was based on the general ENCAP course agenda. (see <a href="http://www.encapafrika.org">www.encapafrika.org</a> ). The principle modification was the treatment of USAID procedures in an optional morning session. The final agenda is attached.
<b>Sources of funding and support</b>	<p><b>Support via contractual mechanism:</b></p> <ul style="list-style-type: none"> <li>• USAID/Nigeria issued a firm fixed price Purchase Order (PO) to Tellus in the amount of USD 64,956 upon arrival of Wes Fisher in country for course pre-planning (September 30, 2002). The PO was intended to cover labor, travel and per diem for Fisher's TDY to identify case sites, and the costs of subsequent course preparation and presentation. These costs included labor, travel and per diem of the principal Tellus trainer; two local experts/presenters; local logistics coordination; the costs of up to 25 course participants, hotel facilities rental; and other miscellaneous costs including course materials, printing and rental of vehicles for case site visits, etc.</li> <li>• The change of the venue to Abuja increased venue and per capita per-diem costs. Upon arrival of Mark Stoughton in-country for course delivery, a contract modification was initiated, adding \$11,682 to the purchase order to cover these additional costs. Of this additional amount, approximately two-thirds was allocated to SCN. The contract modification was signed on 1 November 2002. (The final budget is attached to versions of this report distributed in hardcopy.)</li> </ul> <p><b>Non-contractual support:</b></p> <ul style="list-style-type: none"> <li>▪ During preplanning, USAID provided logistics support and transport (vehicle and driver) for a visit by Weston Fisher to SCN offices in Kaduna for 30 Sept-Oct 1 and to NAERLS/ABU in Zaria. The purpose of the NAERLS trip was to meet with and enter into a subcontract agreement with Dr. Chikwendu Damian Okey who served as the socioeconomic expert (see below). Fisher was accompanied by Nduka Okaro on this trip.</li> <li>▪ USAID also provided transport (vehicle and driver) and logistics support to Weston Fisher for reconnaissance work and case site identification in Bauchi and Yankari from Friday Oct 4 through Sunday October 6. Fisher was accompanied by Nduka Okaro and by Ayo Olojede.</li> <li>▪ ADP provided staff time for the selection of case sites and during the field trip excursions</li> </ul>
<b>Principal trainer</b>	The principal course trainer was Mark Stoughton of Tellus Institute. He had responsibility for coordinating the course agenda, assigning presenters, and personally presenting about half of the course sessions.
<b>Logistics</b>	<ul style="list-style-type: none"> <li>• Tellus subcontracted with Savanna Conservation Nigeria to serve as the logistics coordinator for the course under a firm fixed price agreement of \$34,217.</li> <li>• SCN's designated logistics coordinator for the course was Yakubu Dalhat, SCN's Project Support Manager.</li> </ul>
<b>Local experts</b>	<p>Tellus entered into local subcontractor arrangements with an environmental expert and a social scientist recommended by USAID/Nigeria. These individuals brought expertise on the environmental and social context in Nigeria/the FCT as they relate to environmental impact assessment. They prepare background papers, facilitate case study groups, and present course sessions. Local experts were engaged under firm fixed price contracts of USD 1,500 each for a minimum of 12.5 days of effort/person.</p> <ul style="list-style-type: none"> <li>▪ Dr. Chikwendu Damian Okey, Assistant Director, Research and Planning, Nigerian Agricultural Economics and Rural Sociology Unit (NAERLS) at Ahmadu Bello University in Zaria, served as socioeconomic expert.</li> <li>▪ Ayo Olojede, Assistant Director of Research and Statistics, Federal Ministry of Environment Abuja, served as environmental specialist.</li> </ul>

<p><b>Case study sites and descriptions</b></p>	<p><b>Abuja-area case sites.</b> The change of the course venue to Abuja meant that the Yankari-area case sites identified during preplanning could not be used. (These initial case sites are described below).</p> <p>Prior to Mark Stoughton’s arrival in-country (28 Oct.), Yakubu Dalhat and Ayo Olojede undertook an initial visit to the FCT office of the Agricultural Development Project (ADP), a parastatal agricultural extension organization. They approached the office to solicit its assistance in identifying suitable case sites in the FCT.</p> <p>The office (located in Gwagwalada town, approx 1 hour from Abuja center) accommodated this request and three case studies were identified during 1.5 days of subsequent visits by Mark Stoughton. The ADP provided staff time and a vehicle to assist with case site identification. (Yakubu Dalhat accompanied Mark Stoughton on the initial half-day visit.) The case studies were as follows:</p> <ol style="list-style-type: none"> <li>1) Agroforestry interventions in the context of urbanization. This case study involved a visit to a long-term Fulani settlement being encroached upon by the growth of Gwagwalada town, and a visit to an area subject to intensive deforestation/charcoal production to serve the needs of the rapidly urbanizing FCT.</li> <li>2) Abattoirs and public health, with an emphasis on urban surface water quality. This case study involved a visit to two contrasting abattoirs, one in Gwagwalada and one in Abuja city proper.</li> <li>3) Area development: small-scale pumped irrigation and market access roads. This case study involved a visit to a rural community farming without irrigation or adequate road access, contrasted with a visit to agricultural sites with these improvements.</li> </ol> <p><b>Initial (Yankari area) case sites.</b> Case sites were identified during Wes Fisher’s preplanning TDY via a visit to the Bauchi Area between 4-6 October. Case studies centered around:</p> <ol style="list-style-type: none"> <li>1) impacts of deforestation, overgrazing and slash and burn agriculture in the Yankari watershed and potential mitigation strategies at both the watershed and individual activity level;</li> <li>2) health, water and sanitation impacts at the community level;</li> <li>3) rural access roads and income generation alternatives; and</li> <li>4) park infrastructure impacts and mitigation measures.</li> </ol> <p>Visits related to watershed issues were to take place on the western side of the Park, focusing primarily on stops in the northwest corner (Dindima and Yashi River) and the community of Duguri in the southwest. A second team was also to travel down the west side of the park, examining environmental impacts and mitigation measures associated with health, water and sanitation issues in the communities of Dindima, Galembi, Gar, Duguri and Dogon Ruwa. A third team was to look at infrastructure impacts within Yankari National Park, including road and bridge impacts (e.g., Twin Drifts and potential Barkona Bridge impacts near Marshal Cave Hippo Pools) with special emphasis on the hippo pools, and the effects of staff habitation within the Park. The fourth team was to examine environmental impacts associated with rural feeder roads and alternative income generating activities among communities on the northern edge fo the Park, including the communities of Fali, Kufa, Maiari and Kwala.</p>
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### Consultants’ comments and evaluation

The substantive evaluations the course received were high —4.41 out of 5 for quality of content; and 4.34 out of 5 for the degree to which the course improved participant understanding of

environmental assessment. (Average evaluation scores for courses in this series are 4.3 and 4.2, respectively.)

These evaluation scores are particularly gratifying as the last-minute change in venue from Bauchi to Abuja, while unavoidable, presented three significant logistical challenges to the course: (1) Identifying new case sites, (2) making logistical arrangements with a new venue hotel, and (3) undertaking a contract modification and obtaining sufficient funds in Nigeria to pay for the increased up-front costs of the Abuja venue. Each is discussed below:

Groundwork laid by Nduka Okaro (USAID/Nigeria), Yakubu Dalhat (SCN) and Ayo Olojede (Federal Ministry of Environment & contracted environmental expert) and the very generous cooperation of the FCT office of the Agricultural Development Project made identification of a new set of case sites possible. Yakubu Dalhat conducted follow-up during the first days of the course to confirm the case site logistical arrangements.

Only one element of the planned case study itineraries was not fulfilled during the course itself: the group examining agroforestry interventions was unable to reach its second site to observe an area of extensive charcoal extraction. Under the circumstances, this is an exceptionally low failure rate.

Groundwork laid by Nduka Okaro and follow-up by Yakubu Dalhat secured the Crystal Palace Hotel in Abuja for the course venue. The Crystal Palace facilities and staff met the needs of the course quite well.

Obtaining sufficient funds in-country to meet immediate expenses (e.g., hotel and per diem payments) was, in the end, the most serious logistical obstacle with which the organizers had to contend. USAID did not allow an advance to Tellus under the terms of the Purchase Order, and after arrival of Mark Stoughton in-country, it became apparent that the change of venue to Abuja would result in significantly increased immediate cash costs for course delivery. Due to wire transfer delays, SCN effectively advanced its own funds for several days before the arrival of a second wire transfer from Tellus.

Because the Purchase Order was presented for Weston Fisher's signature upon his arrival in Nigeria for the preplanning visit, there was no opportunity to discuss contracting mechanisms or terms of payment. In future, Tellus will strongly prefer contract mechanisms that provide a means of obtaining cash in-country for immediate expenses.

Higher costs due to the change in venue also required a contract modification. Nduka Okaro was able to obtain this modification prior to the actual start of the course.

The high evaluation scores are direct indicators that these logistical challenges were met successfully. The credit goes largely to SCN and Yakubu Dalhat, Nduka Okaro, and the FCT office of the ADP. We are very grateful for their efforts, which in each case exceeded their duties.

The change in venue to Abuja presented one additional challenge to the course: keeping participants in attendance throughout the five days. Courses in this series are, as a matter of policy, held outside the capital to facilitate access to case sites and to prevent participants from being called away to the office on other business. Consistent attendance was a problem for a majority of the Abuja-based participants, particularly those in government and with USAID. As some of the participant evaluations indicate, this detracted from the value of the training experience for a number of participants.

## Attachment A: Key Contacts

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## **Attachment B: Participant's List**

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## Attachment C: Course Agenda



# AGENDA

**USAID Regional Course in Environmental Assessment and Environmentally Sound Design for Small-Scale Activities  
Abuja, Nigeria • 3–8 November 2002**



Day/Time	Session
<b>Sunday 3 Nov</b>	<b>Registration, Dinner and Course Introductions</b>
15:00-18:00	Registration and Logistical Arrangements
17:00-18:00	Facilitators' Meeting
<b>Mon 4 Nov</b>	<b>Environmentally-Sound Design, Basic EIA and USAID Environmental Procedures, EIA Information Needs and Tools, Introduction to Mitigation and Monitoring</b>
8:30-9:00	Opening Statements
9:00-9:45	1. Presentation of Course Agenda, Participant Introductions, Expectations
9:45-10:45	2. Why Assess Environmental Impacts? <i>and</i> Introduction to Environmentally Sound Design (with opportunity for discussion of participant experiences)
10:45-11:00	<i>Break</i>
11:00-11:45	3. Basic Concepts for Assessing Environmental Impacts
11:45-12:15	4. EIA Procedures for Small-Scale Activities (the USAID example)
<b>12:15-13:15</b>	<b><i>Lunch</i></b>
13:15-14:15	4 (cont'd) Workgroup exercise: Practice screening activities using the Environmental Screening Form
14:15-15:15	5 Information Needs and Tools for EIA
15:15-15:35	<i>Break</i>
15:35-16:25	6. Introduction to Mitigation and Monitoring

16:25-18:00	7. OPTIONAL SESSION: USAID Environmental Procedures
18:00–18:30	Facilitator’s meeting
<b>19:00-20:15</b>	<b><i>Dinner</i></b>
<b>Tues Nov 5</b>	<b><i>EIA Methods: The Nigerian Environmental and Social Context, Focus on Environmental Reviews, Field Trip Preparations</i></b>
8:30-8:50	Review
8:50-9:50	8a. Information, Background and Resources for EIA in the Nigerian Context: Environmental Aspects
9:50-10:50	8b. Information, Background and Resources for EIA in the Nigerian Context: Social Aspects
10:50-11:05	<i>Break</i>
11:05-11:35	9a. Writing the Environmental Review
11:35-11:50	10a. Role Play Briefing
11:50-12:50	10b. Role Play Preparation
<b>12:50-13:50</b>	<b><i>Lunch (meet in Role Play Groups if necessary)</i></b>
13:50-14:45	10c. Role Play
14:45-15:30	11. Assessing a sample Environmental Review (written to the proposed activity debated in the role play exercise)
15:30-15:40	12a. Field Trip Briefing
15:40-16:00	<i>Break – Sign Up for Field Trip Teams</i>
16:00-17:00	12b. Field Trip Case Study Background
17:00-18:00	12c. Working groups: Preparations for Field Trip Activities- Planning the Field Assessment (to be continued after dinner if necessary)
18:30-19:00	Facilitators’ Meeting
<b>19:00—</b>	<b><i>Dinner</i></b>
<b>Wed Nov 6</b>	<b><i>Case Study Field Trip</i></b>
	12d. Field trip to case study sites. (Teams of 10–12 participants travel to separate sites; conduct initial assessments in the field. Teams depart per time posted. Box lunch. Return by dark.)
17:00-18:30	Facilitators’ Meeting
<b>19:00-20:00</b>	<b><i>Dinner</i></b>
20:00-22:00	Possible session: Additional Topics of Special Interest
<b>Thurs Nov 7</b>	<b><i>Developing Environmental Documentation from the Field Case Studies</i></b>

8:30-8:50	Brief Reactions from the Field Trip Groups
8:50-9:00	13a. Instructions to Environmental Review Teams
9:00-11:00	13b. Team Working Groups: Drafting Environmental Reviews for Case Studies (includes break)
11:00-12:30	13c. Plenary: Presentation and Discussion of Draft Environmental Assessment or Environmental Review Outlines
<b>12:30-13:45</b>	<b>Lunch</b>
13:45-14:00	13d. Instructions on Developing Mitigation and Monitoring Plans
14:00-16:00	13d (cont'd) Team Working Groups: Developing Mitigation and Monitoring Plans from Case Studies
16:00-16:15	<i>Break</i>
16:15-17:45	13e. Plenary: Presentation and Discussion of Draft Mitigation and Monitoring Plans
18:30-19:00	Facilitators Meeting
<b>19:00-20:00</b>	<b>Dinner and Entertainment</b>
<b>Friday Nov 8</b>	<b>Mitigation and Monitoring Plans, Special Topics, and Synthesis</b>
8:30-9:15	14. Beyond Environmental Review: The Full <i>Environmental Assessment</i> Study and <i>Programmatic Environmental Assessments</i>
9:15-10:30	15. Environmental Assessment of Pesticide Use in USAID Activities, Integrated Pest Management Impregnated Bednets
10:30-10:45	<i>Break</i>
10:45-11:15	16. Special topics: Water Quality and Arsenic, HIV/AIDS and EIA, Links to Governance
11:15-11:45	17. Synthesis, Recommendations for Follow-up Activities and Course Evaluation
<b>11:45-12:45</b>	<b>Lunch and Closing</b>
12:45-13:00	Award of Certificates
13:00-	Facilitators available for Individual Consultations

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## ***Attachment D: Final case site descriptions***

# **Case Study Briefings**

## **USAID/Nigeria Environmental Assessment and Environmentally Sound Design Training 4-8 November 2002**

### **Notes and cautions:**

These case study notes have been generated based on information that is sometimes conflicting or incomplete. If any participant has information that corrects or presents another picture of the situation, please inform the course facilitators and the case study working group as soon as possible.

**During the discussions with stakeholders, please avoid raising any expectations (or fears) that additional funding or development activities will be forthcoming in the project area.**

In addition, these case studies are intended ONLY as data-gathering and observation exercises. **Participants should NOT offer judgment on the conditions they observe, or phrase questions in such a way as to indicate their opinions.**

These notes are NOT exhaustive. They are intended to be a starting point for field data collection and subsequent analysis by participants.

### **Sources and acknowledgements.**

The following sources were used in construction of these case studies:

1. field notes, case study preplanning survey. October 31/Nov 1 2002
2. ARD, Inc. *Nigeria Environmental Analysis Final Report*. April 2002.
3. CAPS Consultants. *Consevation State of Flora and Fauna within the Bobo Plains of the Federal Capital Territory: Final Report. (1998?)*

The course organizers are profoundly grateful to the director and staff of the FCT Agricultural Development Project (ADP) head office. Following the relocation of the course from Bauchi, their generous efforts have permitted us to offer this critical field component of the training.

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## **Background Information: Federal Capital Territory (FCT)**

### **Environment**

The case study sites are all located within the Federal Capital Territory (FCT), within 2.5 hours drive of the training venue. Information about this area of Nigeria is provided here. It is applicable to all case studies.

**Topography and Climate:** The FCT is located in central Nigeria and covers about 8000 square kilometers centered on about 9° N 7°E. The area possesses a tropical climate with a single April-October rainy season yielding 1500—2000 mm of rainfall per annum. The region is subject to occasional strong windstorms, sufficient to unroof (and occasionally demolish) houses. Harmattan onset is typically in early November.

Terrain is generally gentle and rolling, punctuated in several areas by low escarpments and ridge systems, as well as occasional rocky outcrops (inselbergs). River valleys are generally characterized by broad floodplains

**Soils & Geology:** Most soils in the FCT have a high clay content, though sand content increases as “basement complex” geology (bedrock consisting of granites, gneisses, schist and migmatites) in and around Abuja city proper generally give way to covering sandstone as one moves south of G/lada.. Iron content is high throughout. Flood plains are characterized by deeper soils with higher proportions of silt and/or sand. Soil fertility is generally moderate, with decline in some areas due to continuous cultivation, and water and wind-driven erosion of top soil.

**Water.** The FCT’s principal river is the River Gurara, a perennial tributary of the Niger that flows roughly North to South near the Western edge of territory. The Gurara itself is fed by a number of tributary streams and smaller rivers, many of which are perennial. These tributary streams generally flow East/West.

Reflecting geology and soil chemistry, ground water and many surface waters have a high iron concentration. When used for irrigation, iron-rich waters can, over time, bind certain micronutrients in iron complexes, rendering these nutrients inaccessible and soils less fertile.

**Vegetation and ecosystem zones.** The FCT is generally a wooded (Guinea) savannah, with a fire-resistant tree-cover averaging 15-25% in undisturbed areas. This ecosystem can be seen as a transition between the grasslands of the northern ecological zones and the (originally) forested zones of the south. African mahogany, once an indicative species of this ecosystem, is now extremely scarce, owing to its economic desirability. Isolated patches of semi-deciduous tropic forest do exist in the FCT. Tree species are those typical of West Africa wooded savannah. In Abuja city proper, the native savannah ecosystem has been almost entirely displaced.

In the original master plan for the FCT, the Southeastern corner of the territory (the Bobo plains) was designated as a potential national park. This is a sparsely populated valley of about 80,000 hectares constituting its own watershed and without major road access. Biological survey of this part of the FCT was carried out in the late 1990s. The survey indicated significant deforestation/degradation even in this remote area.

**Wildlife:** Few, if any sizable indigenous grazers or predators remain in the area. Small mammal populations do exist, including monkeys, grass cutter, some small antelope/deer, and porcupine. Cattle are dominant grazers, followed by small ruminants (goats and sheep).

## Socio-economic

**Population and demographics.** Prior to the establishment of the FCT and the consequent relocation of the capital from Lagos, the FCT was sparsely populated and underdeveloped. (The original concept for the FCT called for relocation of all indigenes. In practice, this only occurred in the area of the current city center).

Now, however, the FCT is now the most rapidly urbanizing area of the country<sup>1</sup>, characterized by significant in-migration of diverse ethnic groups and the very rapid growth of numerous “suburban” communities providing service labor to the capital. Population density is higher closer to the city center, reflecting the growth of these communities. Density falls off markedly as one moves south of Gawandalanda, where suburban towns are replaced by smallholder farming villages.

Rural and urban fertility appears to reflect national averages (i.e. rural fertility producing growth rates of 3% per annum and urban rates slightly less). However, in-migration results in population growth substantially exceeding the national average

Indigenous ethnic groups in the area include Gwari, Gede, Bassa, Gwandara, Igbirra, Hausa and Tiv. In-migrating population represent a large diversity of groups. Traditional (animist) beliefs are dominant in most of the indigenous groups.

**Economic and subsistence activities.** In the rural areas, smallholder farming is by far the dominant economic and subsistence activity. (See “smallholder cultivation practices and food security,” below.) Some commercial farms do exist. Many households keep poultry and small ruminants. While not a dominant economic activity in the area, significant numbers of cattle are held, principally by the minority Fulani population.

As noted, the “suburban” communities house commuter workers for government and the supporting service economy. These suburban communities in turn provide a service economy to support the commuter population and may serve as regional market centers for outlying rural villages. Even in the suburban communities, however, agriculture is often an important income supplement.

In most rural areas, sufficient trees are standing that firewood is obtained on a foraging basis and managed woodlots are scarce. The traditional “3-stone fire” is the dominant cooking technology in these areas. Firewood represents a significant expense for most households in “suburban” communities, however, and such communities are typically surrounded by a significant deforested zone. Tree felling to support charcoal production for rapidly growing urban communities is an increasingly important extractive activity in rural areas with good road access.

**Road infrastructure and market access.** The central area is linked by high-speed all-weather highways to East, West, North and South. As is typical of Nigeria, the secondary road network is generally superior compared to the African norm. However, a number of farming communities, particularly in the southern part of the territory, lack market access roads altogether, or are served by roads in very poor condition. Maintenance of such roads typically falls principally on community labor.

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<sup>1</sup> Nigeria as a whole is urbanizing rapidly, with 60% of the population expected to be living in urban areas by 2010, tripling the 1970 level of 20%.

**Health.** Previous development programs have resulted in provision of boreholes to many rural villages, and nearly all suburban towns at least possess pumped borehole/elevated storage tank systems. However, water-borne diseases remain the principle health threat in both the rural and peri-urban areas. In many suburban communities, 50 percent or less of the population has easy access to pipe-borne water via public standpipe or tap. The remaining population relies on water vendors or open wells, often supplemented with water from streams and rivers. The health implications of poor water access are compounded in the peri-urban and downstream areas by poor sanitation, which contaminates surface waters.

### **Smallholder cultivation practices and food security**

**Dominant crops.** Basic subsistence crops are sorghum, maize, millet, and cassava. Rice is also grown in floodplain bottomland. Yams are the crop of choice for food-secure farmers, reflecting both the value of yams as a cash crop, and the up-front expense of yam cultivation. (Seed yams sell for approx 20 Naira, translating to 200,000 Naira per fully seeded hectare.) In addition to yams, melon (egusi) and vegetables are the principal cash crops. Utilization of improved varieties is relatively low.

**Landholdings.** A rule-of-thumb measure employed by ADP relates household land holdings to food security. Food-secure households have 5 or more hectares under cultivation; medium-secure 2—5, and food-insecure households have less than 2 Ha under cultivation. The average in the area is 2.5—3 Ha.

**Labor.** Women are actively involved in farming, particularly subsistence crops and livestock-rearing. They also process foodstuffs for sale, mostly at farmgate prices. Children are often involved in harvesting and irrigation.

**Cultivation methods and soil fertility.** Traditional cultivation is rain-fed, often with early dry-season cropping utilizing residual moisture, particularly in the flood plains. Irrigation via simple diversion canal is practiced in a limited way in the flood plains directly adjacent to the rivers.

Relatively low population densities in rural areas have previously permitted rotational fallow and cultivation-shifting practices. However, such practices are not possible where population density increases, or where land tenure arrangements do not permit these practices.

Traditional tillage is by hand; fields are cleared by burning prior to tillage. ADP provides subsidized tractor tillage (2000 Naira/Ha). Animal traction tillage is not traditional to the area, though a few farmers keep animals for this purpose and ADP has made efforts to promote the practice.

Declining soil fertility is a problem in some areas under continuous cultivation, where deforestation has exacerbated wind-driven dry-season erosion, and in areas subject to water-based erosion.

**Soil amendments.** Inorganic fertilizers are little used due to income constraints, limited credit facilities, and limited absolute availability. Manure and crop residues are used in a limited way, particularly in plots close to homesteads. Intensified cultivation has the potential to result in significant nutrient mining.

**Processing and storage.** On a national basis, Nigeria is estimated to lose X% of its grain crops to post-harvest pests and spoilage. Practices in the FCT are typical, and losses in the FCT thus likely reflect this average. In addition to adversely affecting food security, inadequate storage and processing facilities adversely affect income derived from cash crops: Because most of the cash

crops are perishable (e.g., vegetables), the lack of storage and processing facilities for these crops forces farmers to sell into glutted markets at depressed prices.

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## **CASE STUDY 1:**

### ***Agroforestry interventions in the context of urbanization***

#### **Assignment**

Participants will conduct an environmental review of a *hypothetical* project using agroforestry interventions to address pressures placed by urbanization on land use and resources.

The purpose of the project may be (1) to facilitate the co-existence of indigenous and in-migrating populations and to preserve the livelihoods of indigenous populations, or (2), to preserve the savannah environment in the FCT more generally.

The participants will visit a Fulani community being encroached upon by the growth of Gwagwalada town as an example of the pressures that urbanization can place on the livelihoods of pre-existing rural populations. Participants will also visit an area subject to large-scale tree-felling and fuelwood extraction to support rapidly growing “suburban” settlements.

However, this exercise is **NOT** intended to be a critique of the specifics of the ADP agroforestry interventions nor forest resource management in the FCT. Instead, it is intended to inform participants regarding the effects of urbanization on aspects of the environmental baseline in the FCT, and to illustrate advantages and barriers of agroforestry interventions as a means of addressing them.

Recall that an environmental review of ANY proposed project requires evaluation of the baseline situation in the area, and an evaluation of how the proposed project would affect this baseline.

In this case, the baseline situation itself is deteriorating, and the proposed project would mitigate aspects of this deterioration. Thus, the need to understand and quantify the baseline situation is particularly clear.

Participants will therefore be expected to carry out a survey of the existing environmental, social and economic conditions and trends in the case study sites (the baseline).

Following the case study site visit, the participants will (1) define their hypothetical project, (2) prepare an environmental review report for this project, and (3) prepare an environmental mitigation and monitoring plan that is appropriate to the type and level of impacts that are likely to be caused by such a project.

The review will be presented to the rest of the group for discussion in plenary.

#### **Urbanization and pressures on land use and resources**

As noted in the background section, the FCT is the most rapidly urbanizing area of Nigeria. Rapid urbanization places pressures on resources and land in previously unexploited areas. Demand for fuelwood and charcoal is one of the most environmentally visible such effects. Rapidly growing “suburban” communities are typically surrounded by a significant deforested zone, but tree-

felling to support growing populations can take place in areas some distance removed from towns themselves. Wood extraction and charcoal production are usually facilitated by road access. Given projected population growth and continued in-migration to the FCT, very substantial loss of Savannah tree cover in the FCT is possible within a generation. This would result in increased erosion, soil degradation, and land tenure conflicts. All have negative implications for future food security and incomes.

Participants will visit a site where substantial tree-felling and charcoal extraction are occurring. This constitutes one aspect of the current “baseline situation” in the FCT.

Urbanization has another impact on lands and resources: when growing suburban towns encroach on rural communities, urbanization can deny these rural communities access to the land and resources upon which they previously depended. This situation is particularly complicated where urbanization encroaches on pastoralist populations. In this case, the environmental baseline situation is being changed due to urbanization in a way that no longer permits resources such as grazing land to be utilized as they had been previously. (Indeed, the grazing land may be completely converted to structures and fields.)

Participants will visit a Fulani settlement which has been encroached upon by the growth of Gwagwalada town.

Agroforestry and managed woodlots are one type of intervention which can address certain land use pressures resulting from urbanization. Managed woodlots are a potential alternative to unchecked tree-felling and charcoal production in the countryside. Agroforestry interventions can also provide a managed source of wet and dry-season fodder, allowing animals to be raised and fed within a fenced enclosure.

### **The case study itinerary**

**Kutunku.** Participants will first visit this long-established Fulani settlement, now being encroached upon by the growth of Gwagwalada town. Kutunku was the site of an agroforestry intervention by ADP in which trees were planted on a wide (4m) grid with inter-planting of forage crops (e.g., cowpeas) planted. By fencing the 2 Ha plot, the enclosure would provide stationary wet and dry season forage/fodder for cattle, as well as serving as a windbreak and a productive use of depleted land. Unfortunately, the intervention has now largely failed, with most of the trees felled, the fencing removed, and the plot employed as a typical, unirrigated agricultural field. The field exhibits signs of declining fertility. Participants will have the opportunity to talk with community residents regarding both this agroforestry intervention and the implications of surrounding urbanization. Before the visit, ADP staff will brief participants on the technical aspects of the agroforestry intervention they performed.

**Kuje area wood extraction site.** Participants will visit an area characterized by large-scale tree felling and firewood production serving demand created by Kuje and other fast-growing settlements. Participants should take this opportunity to assess the impact of these activities on the baseline situation (i.e., the savannah ecosystem).

**Other agroforestry/managed forestry sites.** Time permitting, participants may visit additional intervention sites.

### Mitigation issues

Clearly, a project of this nature is intended to deliver benefits that derive directly from improvements to the environmental baseline. Thus, the nature of these improvements are of *critical concern* to the project. The environmental review should document these anticipated benefits.

Further, the environmental benefits of the project must be sustained over the long-term for the project to achieve its goals. Specifically, this means that the structures and management practices improved for abattoir improvement must be sustained over the long term.

Thus, in this case, the environmental review should identify mitigation measures to *assure continuity of project benefits*. Mitigation measures should also address the possibility of any adverse impacts.

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## ***CASE STUDY 2: Abattoirs and public health, with an emphasis on urban surface water quality***

### Assignment

Participants will conduct an environmental review of a *hypothetical* proposed project to improve abattoir management in urban and peri-urban areas of central Nigeria.

The purpose of the project is to protect public health. The principle source of this improvement is expected to be improved surface water quality.

The participants will study two abattoirs—one in Gwagwalada and one in Garki—and the communities immediately surrounding them as comparative examples of abattoir management practice. The participants will also visit the Gwagwalada water treatment works to understand the relationship between surface water quality and the successful use of water treatment technology to produce safe drinking water.

However, this exercise is **NOT** intended to be a critique of the specific practices at either abattoir, nor of the waterworks. Instead, participants are intended but a review of the environmental and public health issues associated with projects of this type, and in this general environment.

Recall that an environmental review of ANY proposed project requires evaluation of the baseline situation in the area, and an evaluation of how the proposed project would affect this baseline.

In this case, the baseline situation contains serious threats to public health. The project's public health benefits would derive *directly* from environmental improvements in the baseline situation. (See "potential environmental issues, below.") Thus, the need to understand and quantify the baseline situation is particularly clear.

Participants will therefore be expected to carry out a survey of the existing environmental, social and economic conditions and trends in the case study sites (the baseline), noting those conditions and trends that are likely to be affected by the project area activities.

Following the case study site visit, the participants will (1) define their hypothetical project, (2) prepare an environmental review report for this project, and (3) prepare an environmental

mitigation and monitoring plan that is appropriate to the type and level of impacts that are likely to be caused by such a project.

The review will be presented to the rest of the group for discussion in plenary.

### **Abattoirs, surface water quality and public health**

The most common connection made between abattoirs and public health is the need to assure that only safe meat products enter the market. Nigeria’s regulation of abattoirs clearly reflects government’s interest in averting disease and epidemic stemming from public consumption of contaminated meat products. In the FCT, slaughter of cattle can only be performed at official abattoirs, and qualified inspectors must approve or condemn each animal brought for slaughter.

However, there is an additional, very strong connection between abattoirs and public health. This concerns the intimate connection between waste management in urban settings and public health. This is particularly true when urban populations rely on urban surface waters—whether directly or via a treatment works—for domestic use.

Abattoirs produce a set of wastes that, if improperly managed, can have severe adverse impacts on public health. These are the byproducts of animal slaughter: blood, internal organs, faeces, fetuses, and condemned carcasses. All can carry diseases. These diseases may be transmitted via insect vectors (as when flies feed on entrails and , or via consumption of surface water contaminated with these wastes. Particularly where cattle production is a dominant economic activity, poor management practices at abattoirs can be among the largest threats to public health.

Water contamination is particularly likely as abattoirs produce large amounts of liquid waste and wastewater. These are both direct products of slaughter (e.g., blood), and a result of necessary washing-down of the abattoir at the end of each slaughter session.

The contamination is likely to be *significant* from an environmental health perspective as abattoirs are typically located in urban areas adjacent to market activity or in lower-income residential areas. Proximity to market activities increases the chance of oral-fecal disease transmission by insect vectors. Proximity to low-income areas increase the chances surface waters will be used for domestic purposes.

Even if the slaughterhouse effluent is not bacteriologically contaminated (and it almost always is), the high organic content of the effluent vastly increases biological oxygen demand (BOD) in any surface water that it encounters. This results in eutrophication and can destroy the ecological productivity of downstream waters.

Waste management at abattoirs—and in urban areas generally—is compounded by unplanned urban development and expansion. Previously “safe” disposal methods may be rendered unsafe by new settlement adjacent to (or downstream) of an abattoir or other source of liquid waste. Similarly, previously safe sources of water may be threatened by upstream development and expansion of settlement.

Of course, abattoirs are not the only threat to urban surface water quality. Participants should also note what other threats to water quality may exist in the case study areas.

### **The case study itinerary**

**ADP head office.** The Agricultural Development Project (ADP) is a parastatal agricultural extension organization. At the ADP’s head office for the FCT, all participants will receive a short

additional briefing on social, economic and environmental conditions in the case study area. Participants should have read the background information provided in these case study materials and be prepared to ask questions of ADP staff.

**Gwagwalada abattoir.** The modern building at this abattoir is not in use, and slaughter is being conducted on an outdoor concrete slab originally intended to serve as a holding corral (lairage) for the animals prior to slaughter. Preparation of small ruminants (in which hair is burned off the intact skin) is conducted nearby, using old tires as a fuel source. Settlement has encroached on the abattoir grounds. Effluent leaches into open ground and is flushed into a small stream at the rear of the compound.

**Gwagwalada water works.** This small-scale water works was constructed in 1981 and currently functions as a reserve facility, as the town is connected to the Lower Usuman dam. The waterworks depends on a resource (surface water of reasonable quality) now threatened by urban development. Participants should utilize the facility tour to gain a better understanding of the extent to which treatment technology depends on source water of a given quality. Participants should take special note of upstream conditions that may threaten this quality, and the steps the Water Board has taken to assure this quality.

**Garki abattoir.** The modern building at this abattoir is very similar in design to that at G/lada. However, this building is in use, and site also features a tire-fueled incinerator for condemned animals and unused body parts. The site is adjacent to a cattle market and is bordered by a stream. The slope adjacent to the site is a heavily settled low-income area.

### Mitigation issues

Clearly, a project of this nature is intended to deliver social benefits that derive directly from improvements to the environmental baseline. Thus, the nature of these improvements are of *critical concern* to the project. The environmental review should document these anticipated benefits.

Further, the environmental benefits of the project must be sustained over the long-term for the project to achieve its goals. Specifically, this means that the structures and management practices improved for abattoir improvement must be sustained over the long term.

Thus, in this case, the environmental review should identify mitigation measures to *assure continuity of project benefits*. Mitigation measures should also address the possibility of adverse impacts (e.g., displacement of existing inhabitants to construct new waste disposal facilities such as incinerators or effluent holding tanks.)

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## **CASE STUDY 3: Area development: small-scale pumped irrigation and market access roads.**

### **Assignment.**

Participants will conduct an environmental review of a *hypothetical* integrated area development project that provides small-scale pumped irrigation and market access roads in the southern extent of the FCT.

The purpose of the project is to increase long-term food security and income of beneficiaries. Food security includes resiliency to poor growing seasons, as well as calorie, protein and nutrient sufficiency in the everyday diet.

The participants will study certain aspects of activities carried out by the ADP and local governments in the southern portion of the FCT as an *example* of such a project. However, this exercise is **NOT** intended to be a critique of the specifics of the activities of these organizations, but a review of the environmental issues associated with projects of this type, and in this general environment.

An environmental review of the proposed project requires evaluation of the baseline situation in the area, and an evaluation of how the proposed project would affect this baseline.

Participants will therefore be expected to carry out a survey of the existing environmental, social and economic conditions and trends in the project area (the baseline), noting those conditions and trends that are likely to be affected by the project area activities. For this purpose, participants will meet with representatives of a community that have not received irrigation interventions to date.

Following the case study site visit, the participants will (1) define their hypothetical project, (2) prepare an environmental review report for this project, and (3) prepare an environmental mitigation and monitoring plan that is appropriate to the type and level of impacts that are likely to be caused by such a project.

The review will be presented to the rest of the group for discussion in plenary.

### **Overview of irrigation and access road activities to be observed**

As noted in the background section, the southern extent of the FCT is sparsely populated and many farming communities have poor market access. However, this area is also characterized by the large flood plains of the Gurara River and its tributaries, including the River Bobo. Silt deposition has rendered these floodplains quite fertile, and extensive sandstone geology creates large, readily recharged aquifers suitable for shallow-pumped irrigation. While farmers can typically obtain one early dry-season crop off these lands using residual moisture, irrigation water would render the land suitable for cultivation throughout the dry season.

Extensive drilling of shallow tube wells was undertaken on certain of these flood plains in the late 1990s. Typically only a few to several meters in depth, the wells consist of a 2" diameter pipe with a screened inlet sunk below the water table. The well is capped with concrete above-ground; the pipe projects through the concrete cap and is furnished with an elbow connection. A small petrol pump can then be connected to pump irrigation water during the dry season. The pumps and training were provided by ADP on a concessionary basis through farmer cooperatives; pumps are paid back over an extended period. (Pump operation costs are thought to be reasonable—roughly 200 Naira for 8 hours of operation).

Increased agricultural production in these communities is only useful if production in excess of subsistence can be readily transported to market. This is particularly true of perishable crops such as vegetables which constitute most cash-crop production. (Vegetables fetch a particularly attractive price during the dry season.) Thus, provision of access roads in the area are closely linked to the success of agricultural productivity interventions. Two such access roads will be visited.

### Some environmental considerations

**Irrigation.** Poorly managed irrigation can lead to increased soil salinity, though this is more likely in arid areas. However, the intensification of cultivation that results from irrigation can lead to loss of soil fertility without proper soil conservation practices. In this area, which possesses high levels of iron in groundwater, prolonged irrigation may bind micronutrients and reduce soil fertility. (The long-term effects of consumption of iron-rich water are likewise uncertain.)

Successful income generation projects tend to lead to in-migration and additional population growth, with attendant deforestation and land conversion. In areas with poor social services, in-migration

**Roads.** Roads deliver many social and economic benefits. However, in the case of roads, poor environmental design is a significant source of quick deterioration of the road itself, and the cause of potentially significant environmental problems.

For example, a poorly designed or constructed road, or one in which drainage structures are improperly maintained, can *significantly worsen* erosion and soil degradation. Roads function as natural conduits for water, and can channel significant flow to a single point when drainage structures fail. Participants will see a number of examples of erosion gullies arising from poor road drainage during the site visit.

Maintenance of drainage structures is particularly problematic after an organization leaves the project site, or even after the road-construction phase of the development program is finished..

In addition to aggravating soil loss via drainage failures, new roads also provide access to previously inaccessible areas. This may facilitate undesirable activities such as uncontrolled deforestation or bush meat extraction, as well as expanded settlement not matched with social services such as schools or health posts.

### The case study itinerary

**ADP head office.** The Agricultural Development Project (ADP) is a parastatal agricultural extension organization. At the ADP's head office for the FCT, all participants will receive a short additional briefing on social, economic and environmental conditions in the case study area. Participants should have read the background information provided in these case study materials and be prepared to ask questions of ADP staff.

**Pandagi.** The case study team will proceed to Pandagi village, reached from Abagi town by a 12-km access road in poor condition . Pandagi village is intended to allow the participants to asses baseline conditions in a "typical" rural community that has not benefited from irrigation interventions; participants will have a chance to meet with and ask questions of Pandagi village residents. (The hard clay substrate in the area did not permit the use of the drilling technology employed elsewhere in the area).

The community does have an access road (a local government project), but the road is in poor condition (road maintenance essentially falls to affected communities). On the return from Pandagi village, participants should spend some time examining the road. The following maintenance and/or environmental design failures can be observed: blocked culverts; new tracks that entirely by-pass culverts; double tracks; failed drainage structures.

**Gada Biu.** After visiting Pandagi village and examining the Pandagi access road, participants will visit an area (Gada Biu) that has received irrigation interventions, and examine an ADP-provided access road. Both should be compared to the conditions observed in Pandagi

### **Mitigation issues**

Both irrigation and road interventions must operate in an environmentally sound way over an extended period for the project to achieve its goals. Thus the environmental review should identify mitigation measures to *assure continuity of project benefits*. Mitigation measures should also address the possibility of adverse impacts arising from in-migration and exploitation of areas opened by new access roads.

### **Attachment E: Case study itineraries**

8:15 am	All groups depart Crystal Palace @ 8:15 am
9:15 am	All groups arrive @ ADP FCT Head office, Gwagwalada
9:15-10:00 am	Brief welcome  Questions and answers with ADP staff (participants will have questions prepared regarding agricultural practices & economic and social conditions in the area.)
10 am	Participants divide into groups and follow schedules below

#### **GROUP 1: Agroforestry to mitigate impacts of urbanization**

10:00-10:20	ADP briefs participants on agroforestry project in Kutunku village
10:20 am	Depart for Kutunku in coaster bus
10:40 am	Arrive Kutunku
10:40-11:40	Discussion with Kutunku villagers and examination of agroforestry site and village area
11:40	Depart for tree felling/charcoal production area near Kuje
12:15	Arrive Kuje area
12:15-1:15	Tour Kuje tree felling/charcoal production area
1:15-2:15	Box lunch in field;
2:15-3:30	Visit other Agroforestry sites?
4:00	Arrive ADP. Drop ADP facilitators. Proceed back to Crystal palace

#### **GROUP 2: Urban public health: abattoirs and urban surface water quality**

10 am	Depart for G/lada water works in coaster bus
	(Discussion of urban health issues?? (e.g., clinic staff?))
10:15	Arriva G/lada water works
10:15-11:30	Tour and question and answer, G/lada water works; Examination of upstream river banks
11:30	Depart water works for ADP office
11:45-12:45	Take box lunch at ADP office; assemble observations from water works visit
12:45	Depart ADP for G/lada abattoir

1:00	Arrive G/lada abattoir
1:00-2:00	Tour and question and answer, G/lada abattoir Examination of town area downstream of abattoir
2:00	Depart G/lada for Garki
3:00	Arrive Garki abattoir
3:00-4:00	Tour Garki abattoir
4:30	Arrive Crystal Palace

**GROUP 3:**
**Area development: small-scale irrigation and market access roads**

10 am	Depart for Pandagi village in 4WD vehicles
11 am-12:30	Meeting with Pandagi villagers & examination of area
12:30-2 pm	Travel back to Abaji via Pandagi access road. Examine road. Take box lunch on road and assemble notes for first half of case study
2:30 pm	Arrive Gada Biu area. Examine irrigation and road interventions
3:30 pm	Conclude Gada Biu
4:00 pm	Arrive ADP. Drop ADP facilitators at office. Proceed back to Crystal Palace via coaster bus
5:00 pm	Arrive Crystal Palace