Equatorial Guinea's Economic Boom:
Effects on Apes & Elephants

ABCG/CI Presentation
CI Headquarters
Arlington, VA
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CI’s Mission:

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.
Background on EG:

• 28,050 km²

• Population: 668,225 (July 2011 est.)

• GDP per capita (PPP): $19,300 (2011 est.)

• Industry: 91.7% of GDP; Agriculture: 3.4%; services 4.9% (2011 est.)

• Main natural resources: petroleum (oil production 322,700 bbl/day (2010 est.)), natural gas, timber

• “2020” Development Plan: diversification
Opportunities:
• Forests include ‘Pleistocene Refuges’ which may be climatically stable with potential for resilience in face of global warming (Leal 2009)
• Ecosystem services include provision of water and food (incl. bushmeat), carbon storage, etc.

Challenges:
• Little information about EG’s species and/or ecosystem services
• Poor enforcement of environmental laws, including in protected areas; typically no EIAs
• Rural poverty widespread
Economic Growth and Conservation: Bridging the Gap

Opportunities:
• Large current investment in development → could become directed towards sustainability
• Desire for “Green industrialization” discussed at recent national industrialization conference

Challenges:
• Little is known about conservation, the importance of healthy ecosystems, and their value in providing ecosystem services
• Few viable alternatives (protein/jobs)
• Corruption, lack of capacity, lack of enforcement, etc.
Economic Growth and Conservation: Bridging the Gap

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• Little is known about conservation, the importance of healthy ecosystems, and their value in providing ecosystem services
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→ We need to obtain and disseminate biological information, prioritize conservation areas, build capacity, and use this to promote conservation and sustainable development by 2020
Conservation International Equatorial Guinea
USAID/CARPE Landscape 1: Monte Alén – Monts de Cristal
In the face of rapid development, what is the status of wildlife in EG?
Distribution of chimpanzees

Source: www.greenpassage.org
Presence of chimpanzees (*P. troglodytes troglodytes*) in EG

Status:
- Vulnerable (IUCN, 1996)
- Threatened (UICN, 2008)

Some studies between 1960 and 1990 demonstrated declines of up to 20-25% of some ape populations in EG.
Distribution of gorillas

Gorilla gorilla

Gorilla gorilla gorilla
Presence of gorillas (*G. gorilla gorilla*) in EG

Status:
- Threatened (IUCN, 2007)
- Critically endangered (IUCN, 2008)

The Rio Campo Natural Reserve in northwestern EG was designated as a priority conservation area for gorillas.
Presence of elephants (*L. cyclotis*) in EG

Status:
- Regionally (i.e. in Central Africa) classified as **Endangered** (IUCN, 2007)

Human-elephant conflict (HEC) appears to be a serious threat in EG
Difficulties Estimating Populations: e.g. Elephants in EG

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>ELEPHANT NUMBERS</th>
<th>RANGE AREA (km²)</th>
<th>% OF REGIONAL RANGE</th>
<th>% OF RANGE ASSESSED</th>
<th>IQI¹</th>
<th>PFS²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEFINITE</td>
<td>PROBABLE</td>
<td>POSSIBLE</td>
<td>SPECULATIVE</td>
<td></td>
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<tr>
<td>Cameroon</td>
<td>179</td>
<td>726</td>
<td>4,965</td>
<td>9,517</td>
<td>118,571</td>
<td>12</td>
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<tr>
<td>Central African Republic</td>
<td>109</td>
<td>1,689</td>
<td>1,036</td>
<td>500</td>
<td>73,453</td>
<td>8</td>
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<tr>
<td>Chad</td>
<td>3,885</td>
<td>0</td>
<td>2,000</td>
<td>550</td>
<td>149,443</td>
<td>15</td>
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<tr>
<td>Congo</td>
<td>402</td>
<td>16,947</td>
<td>4,024</td>
<td>729</td>
<td>135,918</td>
<td>14</td>
</tr>
<tr>
<td>Democratic Republic of Congo</td>
<td>2,447</td>
<td>7,955</td>
<td>8,855</td>
<td>4,457</td>
<td>263,700</td>
<td>27</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>0</td>
<td>0</td>
<td>700</td>
<td>630</td>
<td>15,008</td>
<td>2</td>
</tr>
<tr>
<td>Gabon</td>
<td>1,523</td>
<td>23,457</td>
<td>27,911</td>
<td>17,746</td>
<td>218,985</td>
<td>22</td>
</tr>
<tr>
<td>TOTAL*</td>
<td>10,383</td>
<td>48,936</td>
<td>43,098</td>
<td>34,129</td>
<td>975,079</td>
<td>29</td>
</tr>
</tbody>
</table>
Difficulties Estimating Populations: e.g. Elephants in EG

### EQUATORIAL GUINEA: ELEPHANT ESTIMATES

<table>
<thead>
<tr>
<th>INPUT ZONE</th>
<th>CAUSE OF CHANGE</th>
<th>SURVEY DETAILS</th>
<th>NUMBER OF ELEPHANTS</th>
<th>SOURCE</th>
<th>PFS</th>
<th>AREA (km²)</th>
<th>MAP LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monte Alén National Park</td>
<td></td>
<td>OG3 E</td>
<td>2002 300</td>
<td>S. Engonga, pers. comm., 2002</td>
<td>2</td>
<td>800</td>
<td>10.2 E 1.6 N</td>
</tr>
<tr>
<td>Montes Mitra Sector, Monte Alén National Park</td>
<td>NP DC3 D</td>
<td>2004 700 330*</td>
<td>Puit &amp; Ghiurghi, 2007</td>
<td>2 1,200</td>
<td>10.0 E 1.4 N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Range of informed guess

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1. Key to Causes of Change: DA: Different Area; DD: Data Degraded; DT: Different Technique; NA: New Analysis; NG: New Guess; NP: New population; PL: Population Lost; RS: Repeat Survey (RS denotes a repeat survey that is not statistically comparable for reasons such as different season); ——: No Change

2. Key to Survey Types: AS: Aerial Sample Count; AT: Aerial Total Count; DC: Dung Count; GD: Genetic Dung Count; GS: Ground Sample Count; GT: Ground Total Count; IG: Informed Guess; IR: Individual Registration; OG: Other Guess. Survey Type is followed by an indicator of survey quality, ranked from 1 to 3 (best to worst). Survey Reliability is keyed A-E (best to worst)

3. PFS: Priority for Future Surveys, ranked from 1 to 5 (highest to lowest). Based on the precision of estimates and the proportion of national range accounted for by the site in question, PFS is a measure of the importance and urgency for future population surveys. All areas of unassessed range have a priority of 1. See Introduction for details on how the PFS is derived.
Nationwide survey for apes and elephants in EG

Participants: Anthony Agbor, Antoine Berlemont, Geneviève Campbell, Agustin Ebana, Cayetano Ebana, Juan Antonio Edjang, Diosdado Esono, Hjalmar Kühl, Santiago Mba, Domingo Mbomio, Mizuki Murai, Jose Nsue, Benjamin Nvele, Antonio Nze, Mariano Obama, Bonifacio Owono, Fernando Owono, Heidi Ruffler
Nationwide Survey for Apes and Elephants in EG
Objectives of nationwide survey:

- Obtain an estimation of abundance, density and distribution of great apes and elephants in Equatorial Guinea
- Identify main threats to their populations
- Use these data to identify priority conservation sites and activities, and to establish conservation action plans for apes and elephants in EG
- Build capacity among national staff to enable long-term monitoring and adaptive management
Methodology:
Preliminary Study: Nest and Dung Decay Rates

- Difficult to use direct sightings for animals, therefore use indirect signs (nests and feces)
- Need to know production rate and to determine local decay rate of nests and feces to convert indirect signs into actual abundance

Above: Fresh chimpanzee nest (level 1)

Right: Elephant feces: level 2 (left) and level 3 (right)
Nest and Dung Decay Rates: Recce transects

- “Path of least resistance” (not representative)
- We used Recce transects to search for fresh nests and dung for the preliminary decay rate study, and to obtain more information about the presence of animals
Estimating abundance, density and distribution: Line transects

Line transects are representative and, by measuring perpendicular distance to objects (nests and dung), enable us to estimate density.
Line transects (continued)

1. Direction of travel
2. Line transect
3. Team member
4. Object (e.g. nest)
5. Transect line

© Heidi Ruffler
Interviews

1 interview held at the village closest to each transect, where possible

45 interview questions to determine the presence of threatened primates, specific threats, socioeconomic information, etc.
Types of samples collected:

- Genetic: fresh ape dung
- Pathogenic: fresh ape dung
- Isotopic: water, soil, plants, bones, empty snail shells, ants, termites, butterfly larvae, feathers, etc.

e.g. for pathogenic analysis:

Dung sample (approx. 5g)

Label

© Heidi Ruffler
Camera traps
PRELIMINARY RESULTS
Results: Distance covered

Total distance of transects completed:
Team A: 122.099km (43 transects)
Team B: 111.838km (40 transects)
Results: Nest and dung degradation rates

<table>
<thead>
<tr>
<th></th>
<th>Degradation rate (in days)</th>
<th>Confidence interval (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimpanzees</td>
<td>82.68</td>
<td>69.7 – 104.3</td>
</tr>
<tr>
<td>Apes (general)</td>
<td>75.78</td>
<td>60.2 – 96.6</td>
</tr>
<tr>
<td>Elephants</td>
<td>80.61</td>
<td>72.8 – 88.9</td>
</tr>
</tbody>
</table>

© Mizuki Murai
Human Presence
Mammalian Biodiversity
Presence of central chimpanzee (*P. troglodytes troglodytes*)

Abundance: **8,049** (5,401 – 11,997); CV = 20%
Effective distance: 18m
Presence of central chimpanzee (*P. troglodytes troglodytes*)

Abundance: **8,049** (5,401 – 11,997); CV = 20%

Effective distance: 18m
Presence of western lowland gorilla (G. gorilla gorilla)

Abundance of all apes: 11,147 (7,615 – 16,317); CV = 19%
Effective distance: 15m
Presence of western lowland gorilla (G. gorilla gorilla)

Abundance of all apes: \(11,147\) (7,615 – 16,317); CV = 19%
Effective distance: 15m
Abundance of elephants: \textbf{972} (470 – 1.928); CV = 36%

Effective distance: 4m
Presence of forest elephant (Loxodonta cyclotis)

Abundance of elephants: **972** (470 – 1.928); CV = 36%
Effective distance: 4m
Why do we care?
Development: fast-paced towards 2020
Development and chimpanzees

Chimpanzee
Chimp signs/km
0 - 0.8
0.8 - 2
2 - 3.5
3.5 - 6.2
6.2 - 12

Kilometers
- Human-elephant conflict of increasing concern to human wellbeing
- Current solution: culling of problem elephants
- Mitigation techniques needed
Where do we go from here?
Economic Systems

• Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:
- energy
- fisheries
- agriculture
- services
Economic Systems

• Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:
- energy
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- agriculture
- services
- logging?
Economic Systems
  • Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:
  - energy
  - fisheries
  - agriculture
  - services
  - logging?

Other key goals include:
  “Roads for everyone”
  “Water for everyone”
  “Electricity for everyone”

→ Impacts on ecosystem health, ecosystem services and human wellbeing?
Supply of bushmeat to a Bata market from eight districts, Gabon, Cameroon and the village of Sendje, between two study periods in 2003 and 2010. Carcass count for each location varied significantly between study periods (Gill 2010).
Economic Systems

• Sustainable Consumption

• Rural communities still depend on bushmeat as source of food and/or income, particularly in lean season (Allebone-Webb 2008)

• Agriculture increasingly affected by human-elephant conflict in some areas

→ Need to continue to work with national and international partners on planning, implementation and monitoring of alternative livelihoods projects
Social Systems

• Sustainable Investments

Opportunity:
Add value to EG’s 2020 Development Plan by:
→ Incorporating “green economy” planning
→ Engaging in legal reform and implementation

1. Energy
→ Incorporate EIAs for EG’s infrastructure development and energy sector;
→ Sustainable energy sources, with particular focus on solar energy;

2. Fisheries
→ Engage in fisheries management, including resource monitoring;
Social Systems
• Sustainable Investments

3. Agriculture
→ Promote sustainable agriculture development, with focus on reducing human-wildlife-conflict;

4. Services
→ Tourism services, with particular focus on development of nature-based tourism;

5. Logging:
→ Forestry management, with focus on carbon stock measuring and REDD pilot projects;
→ Protected area management, including sustainable management of EG’s coastlines;
Social Systems

• Sustainable Investments

3. Agriculture
→ Promote sustainable agriculture development, with focus on reducing human-wildlife-conflict;

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Introduction and management of financial mechanisms to ensure sustainable conservation of EG’s resources and increased human wellbeing.
Next Steps

Communication: documentary, outreach, high-level meetings

Development of 5-year plan

Closer working relationship with private sector, civil society and government officials, including Ministry of Infrastructure, etc., as well as with other international NGOs (health, etc.)

Support of additional NGOs and civil society groups in EG, in particular those focused on women
Special Thanks To:

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Hjalmar Kühl and Geneviève Campbell of the Max-Planck Institute for Evolutionary Anthropology (MPI)

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Universidad Nacional de Guinea Ecuatorial (UNGE)

Chele Martinez Marti and Angeles Mang

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And the people of Equatorial Guinea who welcomed us into their villages and forests
Thank you!

Questions?

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