Biodiversity Offsets:

Case examples highlighting conservation outcomes

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Biodiversity Offsets: Case Examples

- Oil and Gas Development: Chad-Cameroon
- Hydroelectricity and Biodiversity Offsetting: Sierra Leone
- Wetland Conservation: USA
- Road transportation: Australia

Biodiversity Offsets: Technical Issues

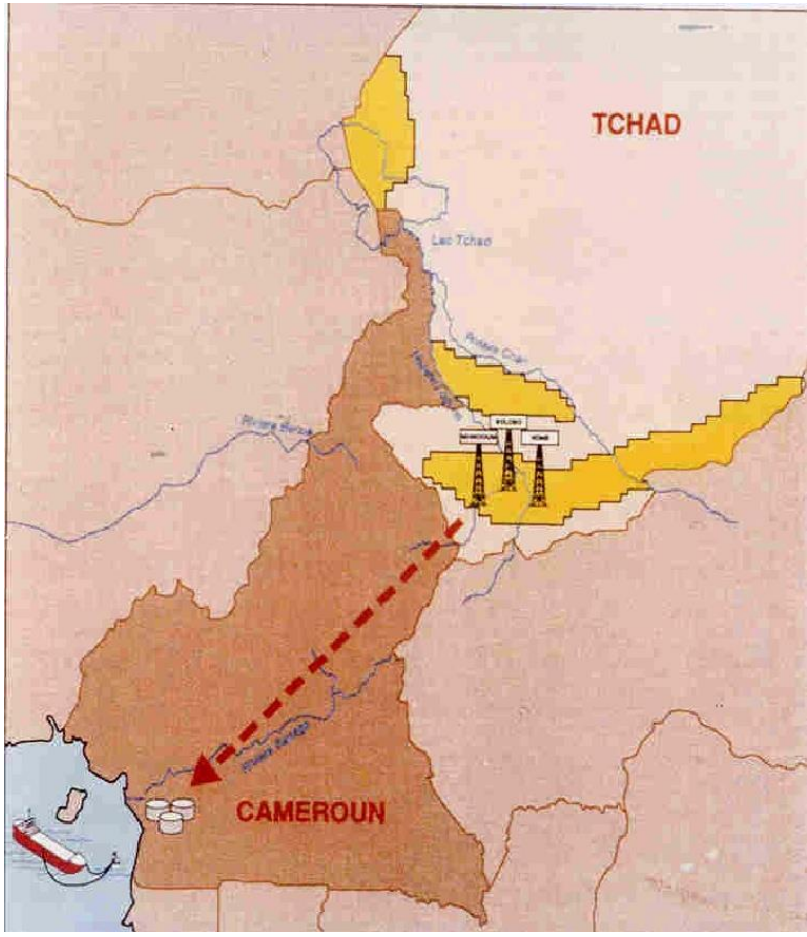
- **Site:** Onsite v/s Offsite
- **Scale:** Small v/s Larger than area of impact
- **Time:** Beginning v/s End of the project
- **Equity:** For whom and By whom

Case I :

Oil and Gas Development: Chad-Cameroon

The Chad-Cameroon Petroleum Development and Pipeline Project

- The Republic of Chad is a land locked African country, having a population of ca 9 million. It is not an industrialized country. Subsistence agriculture is widely practiced.
- The Republic of Cameroon, with ca 16 million population has huge petroleum resources.



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The Chad-Cameroon Petroleum Development and Pipeline Project

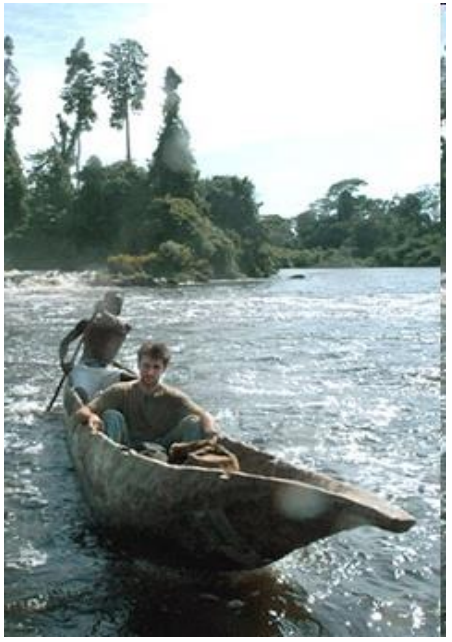
- The Chad-Cameroon Petroleum Development and Pipeline Project, which is the single largest private sector investment in Sub-Saharan Africa was conceived to develop 3 oil fields in southern Chad and to construct an export system consisting of 1070 km pipeline to off-shore oil loading facilities in Cameroon.
- The project involved building of a marine pipeline at Kribi to a floating storage offloading (FSO) vessel.
- A consortium of Esso Exploration, Chevron Petroleum and Petronas funded the project.

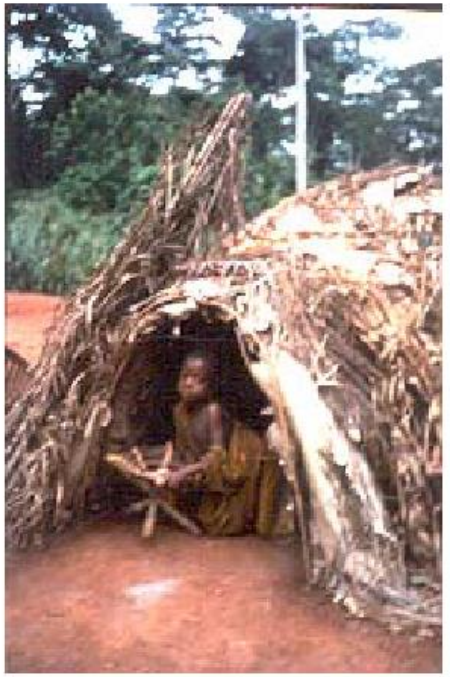
Project Objectives

- To increase Chad Government's expenditure on poverty alleviation programmes.
- To increase Cameroon Government's revenues for financing developmental programmes

Major Environmental and Social Impacts

- Loss of rich natural biodiversity particularly Cameroon's Atlantic Littoral Forests
- Adverse social impacts on Bakola-Bagyeli Pygmy indigenous communities





Source: http://www.pygmies.info/gallery/images/bagyeli-pygmies-mauro-campagnoli-02.jpg

Design and Development of Offsets

- **Establishment of 2 national parks in Cameroon *viz.* Mban-Djerem (US $ 1.5 million) and Campo-Ma an (US $ 1.4 million) to provide better protection and biodiversity conservation opportunities.**

Source: http://www.eoearth.org/upload/thumb/5/5c/ CampoCameroon.jpg/250px-CampoCameroon.jpg

Souce: http://www.discoverychannel.co.uk/web/animalplanet/goingape/

Source: http://assets.panda.org/img/campo1_35845.jpg

Additional measures….

- Development of Indigenous Peoples' Development Plan (US $ 600,000)

Source: http://www.pygmies.info/baka/introduzione.html

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Additional measures….

- Creation of Foundation for Environment and Development (FEDEC) by project consortium and the World Bank for long-term financial support for biodiversity conservation (US $ 3.5 million)

Value of Offsets…

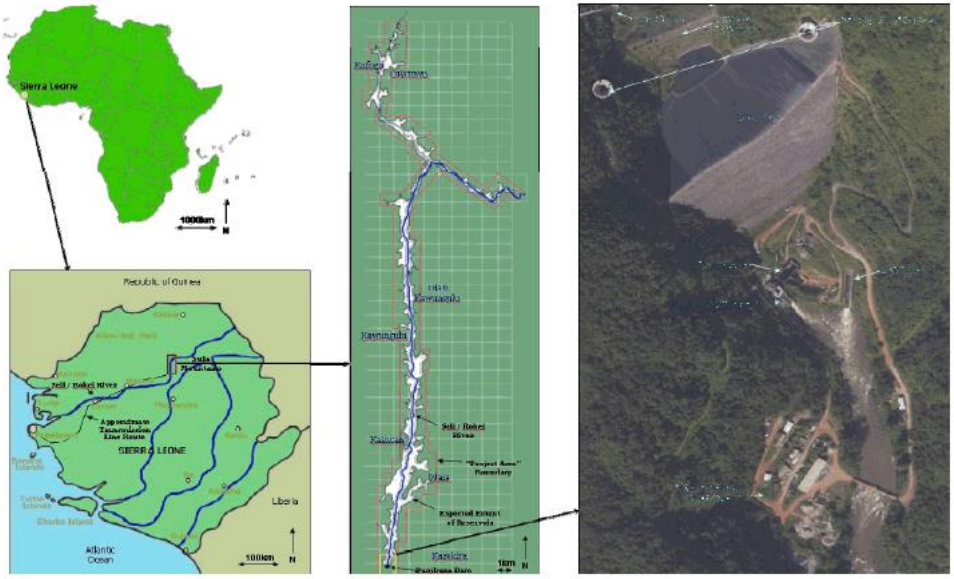
- Although original loss of forests was less than 100 km^2, the 2 national park area exceeds 4,000 km^2 (Case of not one-for-one compensation but biodiversity enhancement)
- Health care, education, housing, improved agriculture practices were also developed to benefit the Pygmy communities

Case II:

Hydroelectricity and Biodiversity Offsetting: Sierra Leone

Source: www.ecosystemmarketplace.com

Introduction and Background



- Bumbuna Hydroelectric Dam was commissioned in 2009 at an estimated cost of US $ 327 million and took 34 years to complete.
- Despite only 160MW of power generation it is Sierra Leone coveted infrastructural development for meeting the acute power needs of the country.

Source: www.ecosystemmarketplace.com

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Introduction and Background

- Following intensive field assessments (EIAs and Additional Biodiversity Studies) of the flora and fauna of the Bumbuna dam area, concerns were expressed over the loss of certain key species in the BHP area.
- The World Bank proposed to establish a protected area with comparable and preferably higher biodiversity than the Bumbuna area.

Source: www.ecosystemmarketplace.com

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Introduction and Background

- Field assessment were conducted to determine whether the Loma Mountains qualified sufficiently to offset the loss to be experienced at Bumbuna.
- The primary goal of the survey was to determine if Loma Mountain Non-Hunting Forest Reserve (LMNHFR) was an appropriate offset for losses at Bumbuna.
- The survey assessed plant, bird, amphibian, small mammal and large mammal diversity.

Source: www.ecosystemmarketplace.com

The Loma Biodiversity Offset

- The study concluded that Loma ecosystem (33201 ha) was sufficiently similar to that of Bumbuna to be a suitable offset.
- If anything, it was a “better” (i.e., more diverse) ecosystem because of its mosaic of habitats including savannas and forests, wet areas and dry ones, the altitudinal range, the manifold riparian (gallery) forests as well as large blocks of contiguous forest, and the abundant wildlife.
- Loma is pristine and has higher density of endemic and endangered species.

Source: www.ecosystemmarketplace.com

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The Loma Biodiversity Offset

- The abundant wildlife has largely escaped extensive exploitation due to the remoteness of the region and the difficulty of access.
- In similar fashion, the undisturbed nature of much of the forest – and the abundance of ancient mature trees - itself is a product of relative inaccessibility with poor and only seasonably passable roads exist around portions of the perimeter.

Source: www.ecosystemmarketplace.com

Sustainable Financing Mechanism

- World Bank financed the setting up of Loma National Park.
- Activities included Demarcation of Reserve, Consultations, Management Plan and putting Park infrastructure in place.
- A Bumbuna Trust Deed (BTD) was visualized to finance the establishment and operation of the Loma Mountain National Park.
- The BTD manages the funds earmarked for the Loma Offset, and community based development activities in the Bumbuna watershed.

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Source: www.ecosystemmarketplace.com

Sustainable Financing Mechanism

- The establishment and first years of the operation of the BWMA, BCA and BTD were financed by the restructured project and were also co-financed by the AfDB.
- Funds for the establishment and maintenance of operation of the Loma Mountains National Park were made available for a period of 5 years.
- Sustainable financing mechanism was put in place by committing government to pay back 3% of tariff money into social (Community development projects) and environmental management.

Source: www.ecosystemmarketplace.com

Institutional Arrangements

- The BTD was set up as a permanent organization that could receive funds from outside the organization for the BWMA and the Loma Mountains National Park.
- The BTD manages the funds earmarked for the BWMA and community based development activities in the Bumbuna watershed and the funds for the establishment and operation of the Loma Mountains National Park (LMNP).

Source: www.ecosystemmarketplace.com

Case III:

The Inland Sea Shorebird Reserve, USA

- Kennewet Utah Copper Mine is North America's largest copper mine owned by Rio Tinto Plc.
- Until the mid 90s, the mine focused its effort on producing copper, molybdenum, gold and silver.
- In late 90s, the company needed additional storage capacity for 'tailings' wastes and after exploring several options, it purchased an area of degraded saltpans and industrial land, adjacent to Great Salt Lake, Utah, USA.
- This property contained designated wetland habitat and as per US law the company had to offset, or mitigate the loss of wetlands by creation of an agreed number and value of habitat units.

Source :
www.mii.org/Kennecott/Ken.html

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- The company went beyond its regulatory obligations to create a 2500 acre (1100 ha) shorebird and waterfowl refuge on a voluntary basis instead of a 1055 acre (427 ha) of wetland on a one-to-one ratio. This wetland was less than a km from the project site.

Source : http://www.swca.com/jsps/

- A Wetland Mitigation Plan was developed in consultation with USFWS, EPA, TNC, National Audobon Society and the US Army Corps of Engineers.
- The site suitability was based upon the criteria of sufficient acreage, geographical and ecological similarity to the impacted area, water availability to sustain aquatic communities and adequacy of food support.

- Construction of wetland mitigation site started in May 1996 and was completed in Jan. 1997.
- More than 100 species including avocets, egrets, curlews, cinnamon teal and snowy plowers (a species that is becoming scarce) now use the wetlands that inundate a landscape that was formerly used for grazing and salt evaporation ponds.
- Results from a 5 year monitoring against baseline data indicates that the mitigation plan has increased wildlife values subsequently.

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Source : http://www.peregrineprints.com/Bird%20Photographs/Shorebirds/

Source : http://www.mobirds.org/Galleries/images/MGrantCA/

Source : http://www.birderblog.com/bird/Species/Plovers/SnowyPlover/Photos/

- Bird surveys point to a 1,000 fold increase in bird use over the baseline numbers for the same site.
- In 2005, Great Salt Lake – Gilbert Bay was identified as an Important Bird Area (IBA), in which the ISSR is a significant contribution to bird use.
- In the long term, the company plans to hand the site over to National Audobon Society to become part of its large bird reserve and contiguous shoreline habitat.

Source http://biodversityeconomics.org/business/hand-01.30.htm
http://www.audobon.org

Source : http://www.nature.org/

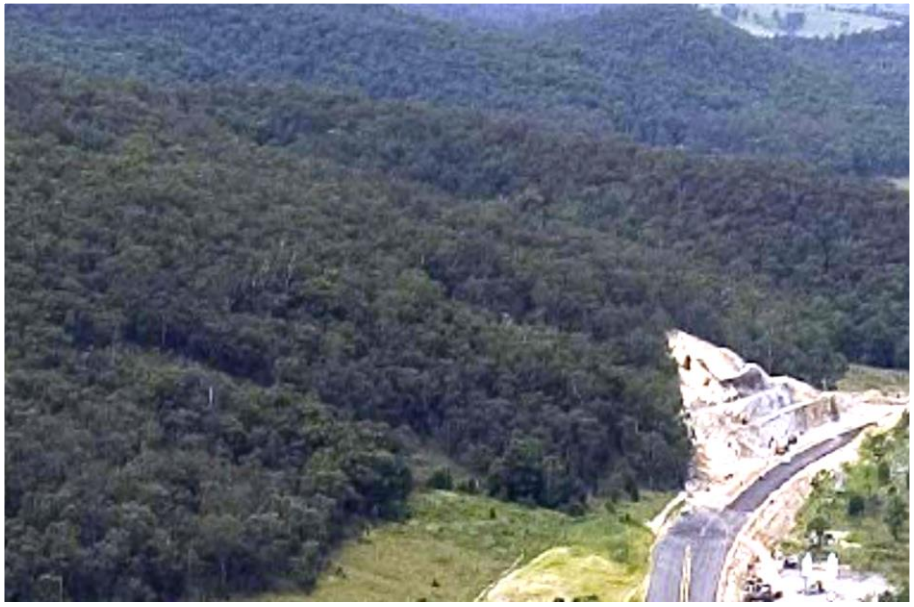
http://www.manowet.org

Case IV:

Karua Bypass Project, Australia

- The name '*Karua*' is an Australian aboriginal word meaning 'Big water hole'/ 'Fast flowing water'.
- The New South Wales State and Federal Govt. proposed to construct a 9.8 km section of dual carriageway to provide safe, better and accident-free means of urban transportation.
- The preferred route for the bypass was selected to avoid/ minimize environmental impacts and to achieve a balance between social, ecological and engineering costs and also provide benefits to local communities.

- Nevertheless, the environmental and species site assessments identified several potential environmental impacts. These included the removal of 47 hectares of vegetation, 16 of which were from the Karuah Nature Reserve.
- The road project also affected mangroves and saltmarsh in Karuah river.



Source : www.banksiafdn.com/index

Development of 'Biodiversity Offset' option

- The Road Transport Authority acknowledged that it could not avoid all the impacts on habitat and a compensatory habitat package was proposed..
- An offset that would deliver an outcome of overall ecological gain was conceived.
- An 89 ha block of privately owned land was identified near the proposed road alignment which contained similar vegetation and many threatened species affected by the road upgrade.
- The NPWS agreed to incorporate the land into the adjacent Karuah Nature Reserve.

Source : www.banksiafdn.com/index

Development of 'Biodiversity Offset' option

- The RTA purchased the land and transferred it to NPWS.
- The process required parliamentary approval under the National Parks and Wildlife (Adjustment of Areas) Act 2001.
- The RTA also agreed to contribute $15,000 towards initial management cost such as weed control and active rehabilitation.
- The RTA negotiated with NSW Fisheries and the NSW Department of Planning for a compensatory habitat package which included protecting mangrove areas and cleaning up old oyster leases, which were creating debris.
- Additional mitigation measures such as 'fauna underpasses' and 'glider over crossing' were implemented by the RTA.

Source : www.banksiafdn.com/index

In conclusion…

Technical Issues Relating to Biodiversity Offsets	RESPONSES			
	Case I	Case II	Case III	Case IV
Site	Onsite	Offsite	Onsite	Offsite
Scale	Offset nearly 40 times the area of impact	Offset twice the area impacted	Offset twice the area impacted	Offset twice the area impacted
Time	No Delay	Partial Delay	No Delay	No Delay
Equity	Positive benefits to biodiversity and also to local communities	Positive benefits to biodiversity conservation	Positive benefits to biodiversity and local communities	Positive benefits to biodiversity and local communities
Nature	Voluntary	Voluntary	Voluntary and Statutory	Voluntary and Statutory
Ownership	Private (Industry)	Government Agency	Private (Industry)	Government Agency

Offsetting in the Marine World…

- Most experience with offsets so far has been in terrestrial systems.
- Marine offsets are not fundamentally different to terrestrial ones but they do pose some specific challenges and complexities.

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Offsetting in the Marine World…

The Challenges/ Complexities…

- Geography
- Ecology
- Politics
- Datasets

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Offsetting in the Marine World…

The Challenges/ Complexities…

Geography

- **Marine ecosystems are highly inter-connected and the BES impacts can be diffused as well as widespread.**
- **Marine species are often highly mobile and move vertically as well and in an unpredictable way.**
- **Complex interactions occur between land and sea.**

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Offsetting in the Marine World…

The Challenges/ Complexities…

Ecology

- **Marine organisms can have complex life histories ~ mobile larval forms to sedentary adults**

- **Population fluctuations may occur during breeding and non-breeding sessions and so do fluctuations in resource availability making offset designing more complicated.**

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Offsetting in the Marine World…

The Challenges/ Complexities…

Politics

- **Tenure and ownership are complex in sea compared to land for example, outside national jurisdictions, the high seas have no biodiversity-focused governance.**

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Offsetting in the Marine World…

The Challenges/ Complexities…

Datasets

- **Marine species/ ecosystems datasets are patchy.**
- **Marine systems are more difficult to survey and monitor.**

In conclusion….

- Despite significant advances in both theory and applications of biodiversity offsets there are several uncertainties that exists in the minds and actions of both the industry and conservation practitioners.
- There is presently a kind of stalemate, in which conservation groups are hoping industry will develop voluntary offsets; academics are debating offset theory and industry is holding off further engagement until more certainty appears or unless regulation force action.

The Way Ahead….

- Provide a reliable space to share experience ~ an online source of offset case studies, both successful and failed ones.
- More guidance is needed in case of offsets in legally designated Protected Areas especially in the context of design and risks involved.
- Nevertheless, biodiversity offsets have a promising future ahead as they can ensure a '*win-win*' for both conservation and development.

Voluntary Corporate Commitments Related to Biodiversity Offsets

Type of commitment, from most to least rigorous:	Illustrative company policy statements, from their websites and publicly available documents such as Annual Reports and Environmental or Corporate Social Responsibility Reports:
Net positive effect	♦ BP CEO: *'We can have a real, measurable and positive impact on the biodiversity of the world. That is a high aspiration - but, like our other aspirations, we're determined to show that we can deliver'*. ♦ Rio Tinto: *'net positive effect'*
'No harm'	♦ BP: *'Our goals are simply stated no accidents, no harm to people, and no damage to the environment.'* ♦ BHP Billiton: *'Zero harm to people and the environment — our goal'*

Source: ten Kate, K.., Bishop, J., and Bayon, R. (2004). Biodiversity offsets: Views, experience, and the business case.

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Voluntary Corporate Commitments Related to Biodiversity Offset

'No net loss'	Waste Management: "*The Company is committed to the conservation of nature. We will implement a policy of 'no net loss' of wetlands or other biological diversity on the Company's property*." (This policy was revoked after 1998 when the company's ownership changed.)
Offset	♦ Rio Tinto: *'Investigating options to offset any unavoidable adverse effects in project areas by conservation actions elsewhere*.' ♦ Rio Tinto: *'Wherever possible we prevent, otherwise minimise, mitigate and remediate, harmful effects of the Group's Operations on the environment*'.

Source: ten Kate, K.., Bishop, J., and Bayon, R. (2004). Biodiversity offsets: Views, experience, and the business case.

Voluntary Corporate Commitments Related to Biodiversity Offset

Positive contribution to biodiversity conservation	♦ United Utilities: 'As far as possible, we manage our 142,000 acres of catchment land in such a way as to produce a positive ecological impact, allow access for recreation and protect raw water quality'. ♦ Northumbrian Water: '[Essex and Suffolk Water is] committed to enhancing biodiversity in our region… and minimising the direct and indirect impact of our operational activities.' ♦ RMC: 'conserve and create habitats that support a diversity of plants and wildlife before, during and after our operations'. ♦ Shell: part of the company's approach on biodiversity is to make a "positive contribution to conservation".
Maintaining ecosystems	♦ Shell: *'Protect the environment*'; *'maintain ecosystems*'.

Source: ten Kate, K.., Bishop, J., and Bayon, R. (2004). Biodiversity offsets: Views, experience, and the business case.

Thank you…

Source : http://www.aeea.org.au