Netherlands Commission for
Environmental Assessment
Dutch Sustainability Unit

Inga Basse Chute and Mid Size Hydropower Development TA Project

Advice on the adequacy of the information underlying decision making

DR CONGO

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Netherlands Commission for Environmental Assessment
Dutch Sustainability Unit

Advisory Report by the Dutch Sustainability Unit

Subject: Advice on the adequacy of the information underlying decision making on the Inga Basse Chute and Mid Size Hydropower Development Technical Assistance Project

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1. INTRODUCTION

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1.1.1 The site and the river

There is no doubt that the Congo river at Inga provides a unique opportunity to generate electricity due to the natural characteristics of the river, a huge base flow (40,000 m^3/s) and a significant natural head (approximately 95 m), providing a potential energy source of at least 30 GW. With proper engineering, the site facilitates a run of river approach that limits environmental impacts. As this has been known since colonial times, competent authorities have secured a concession and prevented people from establishing themselves within the concessions boundary. The site can in principle be developed without a need to relocate families.

1.1.2 History of the project

The availability of this unique hydropower resource has inspired successive generations of decision makers to desiring to develop the resource. The proposed Inga 3 Basse Chute project is a sequential component in a series of developments that started in colonial times, that led to the commissioning of the 351mW Inga 1 facility in 1972 and the 1424 mW Inga 2 facility in 1982 and that is presently assumed to culminate in the development of Grand Inga (Inga 1-8 as proposed by the 2012 Study of Inga Hydroelectric Site Development and Associated Power Interconnections). According to this study Inga in its final stage will eventually provide 42 GW of electricity generation capacity and with, in all probability, relatively small environmental and social costs per megawatt.

1.1.3 Context of Inga developments

Price of the Inga KwH is assumed to be around 3 cUS. Energy at such a price, and the scale of its availability, can boost economic growth in a substantial part of Africa. This fact makes the site extremely interesting. Considering the institutional weakness of the government of the DRC, development of the Inga site requires secure and credible off-takers of energy. Lack thereof will prove the Inga 3 Basse chute investment not bankable. The size of Inga 3 BS's power production (4755 kW) will need off-takers, not only in DRC, but also in the region to make it bankable. South Africa will purchase 2500 kW. SNEL is the national electricity company of the DRC. It is heavily indebted. It goes through a five-year program (2012-2017) for the financial and operational recovery and the enhancement of its corporate governance. The World Bank has a long time involvement in the power sector in the DRC through its Regional and Domestic Power Markets Project.
The government of DRC has a doubtful track record in the power sector. It revoked the terms of an in 2004 signed agreement on Inga 3 with the Western Power Corridor (WESTCOR) consortium (Angola, Namibia, Botswana and South Africa), that had carried out a costly pre-

feasibility study for the proposed 3,000 km 400 kV interconnector carried out in 2005, saying it had allocated the power to another customer.

1.2 The proposal

The 100 pages project appraisal document submitted refers to the Inga 3 Basse Chute and Mid-Size Hydropower Development Technical Assistance Project.
This project prepares the realisation and functioning of Inga 3 basse and haute chute and the realisation of an 800 kV power transmission line to Witkop in South Africa through Kolwezi.

Presently, project costs evaluate at 106,5 million US$ of which the World Bank proposes to cover 73,1 million US$ as an IDA grant to the government of DRC, complemented by a 33,4 million US$ financing by the African Development Bank.

The project proposes the following major components:

Component A) Inga 3 Basse Chute development support,
Subcomponents:

1. studies (20,0 million US$)
2. advice and procurement support (39,5 million US$)
3. institutional strengthening (21,4 million US$)

Component B) Mid-Size hydro development support
Subcomponents:

1. Mid-size hydropower (19,1 million US$)
2. Carbon financing market development (1,0 Million US$)
3. Institutional strengthening (5,5 million US$)

The proposal starts from the concept that development and management of Inga will be done on the basis of a Public Private Partnership and leans on a policy letter of the DRC government and signed by the prime minister of DRC making commitments on 1) project governance for Inga, 2) the fiscal framework for the project and using revenues for electrification of DRC regions currently without electricity, 3) allocation of the power produced, 4) structure of the PPP and use of public financing, 5) the selection process of the developer 6) and environmental and social aspects of the project.

The proposed partners in the project and their roles are:

AfDB African Development Bank	parallel co-financing of TA project
DBSA Development Bank of South Africa	Financing of studies for SAPP transmission lines (outside of scope of TA project)
USAID United States Agency for International Development	Potential support for ADEPI
EIB European Investment Bank	Member of the donor coordination group
AFD Agence Française de Développement	Member of the donor coordination group
IFC International Finance Cooperation	Member of the donor coordination group

1.3 The Request

The Directorate General International Cooperation of the Netherlands Ministry of Foreign Affairs (DGIS) formulated two main questions and a series of additional questions. These questions bear on the documentation that the DGIS has provided to the DSU. This documentation includes:

1. The Project Appraisal Document (PAD) for the Inga 3 Basse Chute and Mid-Size Hydropower Development Technical Assistance Project;
2. The cover letter of the Vice President of the World Bank with the above mentioned PAD;
3. Congo River: Death by a Thousand Cuts? Flaws in the Proposed Environmental Impact Assessment for the Congo's Inga Dams, a Briefing Paper by Peter Bosshard, Policy Director, International Rivers, January 28, 2014;
4. A letter of 30 January 2014 of Peter Bosshard to Mr. Frank Heemskerk Executive Director at The World Bank;
5. The Study of Inga Hydroelectric Site Development and Associated Power Interconnections, Feasibility Stage, Social and Environmental Impact Study Report, Volume 4[1], October 2012 + annexes 6, 7 and 8.

In its request, the DGIS asked for complete confidentiality on this DSU advisory process.

1.3.1 Main questions

DGIS agreed that the DSU addresses the following main questions:

1. Do the documents that the DGIS has submitted for consideration provide sufficient and correct information to decide whether the proposed project INGA 3 (and INGA in its development phases 3-8) contributes to the sustainable development of DRC and other affected countries
    a. Were essential issues not addressed in the documentation or addressed in the wrong way?
    b. Were promising alternatives overlooked?
2. Are any conclusions drawn in the documentation on the contribution of the proposed project to sustainable development of DRC, and, if so, are these reliable. If no or incomplete conclusions were drawn, what risks this poses to a Dutch standpoint on this proposal?

1.3.2 Additional questions

The DGIS formulated the following addition questions:

1. Does this proposal correspond with the criteria of the World Commission on Dams?
2. Did World Bank seriously apply its own safeguard policies?
3. Is the proposal in line with DRC's legislation on EIA/SEA, and does it correspond with international criteria in this field?
4. What is your opinion on the argumentation of the NGO "International Rivers" in their letter of January 30, 2014?

[1] The other volumes of the feasibility study were not available to the DSU.

5. The approach appears to be dominated by energy interests, should it not be a 'nexus'-project?
6. Could you do a reality check, as the documents of the Board often tend to be (too) optimistic?
7. Does the proposal connect to the national priorities of DRC?
8. Does the proposal fit with Dutch Development Cooperation policies?
9. Can you assess the contribution by the IFI to donor-coordination: are the local stations involved, informed?
10. How do you appraise relevant political sentiments (for example consequences for support, commitment, implementation in the long term, sustainability)?
11. How do you appraise relevant/notable positions of other donors/parties involved?

2. Approach chosen

Leading objectives

The DSU advises to use the World Bank objectives as leading objectives. These objectives are read as follows:

Under a partnership of the DRC government with private parties (PPP)

1. Provide electricity to the population and industry of DRC
2. Provide electricity to the region

The World Bank means to realise the objectives through development Inga 3 Basse Chute, the subsequent stages of development of Inga and its interconnection to Witkop, South Africa, and the development of other Hydropower sites in DRC in a sustainable way.

The project upon which the World Bank will decide now proposes to prepare the first phase of realisation by complementing technical and environmental studies and by creating capacity in the relevant DRC government structures.

Beneficiaries of the project now proposed are (PAD para 33-35)

- DRC (ensuring fair sharing of the Inga rent, protecting future Inga's full development, balanced contracts between private and public shareholders and transparent selection of developers);
- Government of DRC by enhanced capacity to attract private financing for critical infrastructure and enhanced performance its public functions related to providing electricity;
- Indirectly (when Inga 3 is built), existing and new customers of SNEL (DRCs electricity company), the mines of Katanga and the Southern African Power Pool (SAPP) from reliable and affordable energy; DRC from additional revenues; local communities from jobs and fair compensation.

The DSU looks at the full range of aspects of the project and subsequent hydropower developments.

DSU working group

The DSU working group included expertise on the African power markets, hydrology, environment and social and gender issues.

Site visit
The DSU has not visited the site of Inga, neither the route of the transmission line. However, the experts on the team are familiar with the river, the site and the route of the proposed transmission line.

Disclaimer
The time available to the DSU for formulating this advice was limited. The DSU indicated to the DGIS that it would focus on the main questions and address the additional questions insofar time would allow.

3. Answers to the questions

3.1 Main questions

Do the documents that the DGIS has submitted for consideration provide sufficient and correct information to decide whether the proposed project INGA 3 (and INGA in its development phases 3-8) contributes to the sustainable development of DRC and other affected countries?

Answer:
No, the documents submitted do not provide sufficient information to decide whether the proposed Inga 3 BC and further Inga developments as foreseen in the Project Appraisal Document (as an PPP undertaking) will contribute to the sustainable development of DRC and other affected countries.

Were essential issues not addressed in the documentation or addressed in the wrong way?

Answer:
Yes, the following essential issues were not addressed or addressed in the wrong way:

1. *Given the objective to develop the project under a public private partnership with the DRC government, this government's track record on governance performance in general, and on sustainable development and investment climate in particular, would have warranted*

   1.1 an assessment of this track record and an in-depth analysis of the (pre)conditions under which this PPP can be made successful
   1.2 an assessment that underpins the time scale that the PAD proposes for this project and subsequent hydropower developments.

These analyses are not included in the Preliminary ESIA and should have been done before formulation of the PAD. Such studies could have assessed and compared the feasibility of other institutional set-ups.

2. *The PAD assumes that firm Power Purchase Agreements (PPAs) can be achieved with Katanga mines for a total of 1300 MW. The DSU considers this assumption to be*

overoptimistic: firstly, it is doubtful whether mining companies will be willing to commit now to bankable PPAs which will only come into effect in 5+ years' time and secondly, total mining demand in Katanga is presently in the order of only 500 MW.

3. *The preliminary ESIA assesses a series of important impacts of Inga development in a superficial way, indicating that further studies are needed (impacts on river and sea biodiversity and productivity [fish, fishing], dam safety and sedimentation).*

    a. *As argued in chapter 2 of this DSU advice, the present proposal to develop Inga 3 BC cannot be separated from further Inga developments. The Impact Assessment proposed under the project should address the cumulative impacts of development of Inga 3 through 8.*
    b. *These studies may lead to the conclusion that the impacts are significant and prohibitive for components of the proposed development. If that were to be the case, than it would be necessary to consider a redesign of the initial project and subsequent stages of development of the Inga site (i.e. to revisit the technical options analysis section of the 2012 Feasibility Study).*

4. *The preliminary ESIA does not, and should have, addressed the impact of climate change on river hydrology.*
5. *The preliminary ESIA does address gender issues for development of the Inga site. The PAD, however, does not, neither does it refer to gender aspects being secured by the Banks safeguard policies. It remains unclear how gender aspects will be paid with due attention to in project implementation.*

Were promising alternatives overlooked?

Answer:

Yes, realistic alternatives have been overlooked.

1. *alternative governance set-ups have not been assessed (see first bullet point in previous section) on their feasibility and potential chance to be successful in mitigating project risks, e.g. the use of independent power producers and power distributors.*

2. *Alternative power generation configurations have not been assessed on their environmental, social, economic and financial feasibility and impacts. The DSU would like to mention two alternatives in particular:*
    - *an alternative strategy that would not preclude Inga development but that would imply 'no regret' investments to produce power for the DRC and the region in a much shorter time frame and with less risk than Inga 3 BC:*
        - *Within DRC, to pay more attention to the small hydropower options in Katanga and work with the mining companies and IPP developers to bring these projects to fruition. There is a small provision in the current project for these projects to be considered (PAD paras 16 and 47-50), but under the alternative strategy this would become a primary rather than a subsidiary focus.*
        - *Accelerate the hydropower projects on the Zambezi (1,500 MW at Mphanda Nkuwa at a cost of about $2 billion, 1,245 MW at Cahora Bassa North at around $0,8 billion and 1,600 MW at Batoka at a cost of $4,4 billion), involving countries with a better governance track record (Mozambique, Zambia and Zimbabwe).*

    - *Reinforce the SAPP transmission grid to permit higher levels of power trade throughout the region. A high priority would be reinforcement of the Katanga-Zambia links, allowing the mines and SNEL to import power from southern neighbours in the short run, while also preparing for the export of power when eventually additional generating capacity at Inga comes on stream.*
- *the proposed Inga developments but without constructing a dam wall on the main river.*

Given the size of the Grand Inga project and the long duration of implementation of its components (perhaps in the order of 25 years or more), there are huge uncertainties with respect to future climate, hydrology, economic developments and regional and domestic political developments. Therefore a comprehensive and critical analysis is needed of potential alternative sequencing of implementing project components, that considers the choice for the alternative that avoids as much as possible lock-in risks, that prioritises no regret investments, that maximises degrees of freedom with respect to subsequent developments options, and that postpones the most dramatic irreversible decisions as much as possible.

The above positions of the DSU are further argued in Annex 1

Are conclusions drawn in the documentation on the contribution of the proposed project to sustainable development of DRC, and if so are these reliable or, if no or incomplete conclusions were drawn, what risks poses the fact that they were not or incompletely drawn to a Dutch standpoint on this proposal?

Answer:
The conclusion in the cover letter of the World Bank's vice president is that the proposed grant would comply with the Articles of Agreement of the Association and the recommendation is to approve the grant.

The DSU agrees with the Vice President except on one article. This article (Article V: Operations, Section 1 sub d.) states:
"The Association shall not provide financing except upon the recommendation of a competent committee, made after a careful study of the merits of the proposal. Each such committee shall be appointed by the Association and shall include a nominee of the Governor or Governors representing the member or members in whose territories the project under consideration is located and one or more members of the technical staff of the Association. The requirement that the committee include the nominee of a Governor or Governors shall not apply in the case of financing provided to a public international or regional organisation."

As follows from the above, the DSU has the opinion that the merits of the proposal were not studied carefully enough. The DSU thinks that the risk is that a Dutch standpoint on the proposal will not be sufficiently incorporated and that the project will therefore fail to ensure that a thorough, a solid knowledge base emerges from the project and consequently that the sequence of Inga projects that is eventually pursued will not deliver the full sustainable development potential that Inga offers.

3.2 Additional questions

Does this proposal correspond with the criteria of the World Commission on Dams?
Answer:
Many aspects of the WCD criteria are in one way or another included in the Preliminary ESIA and/or Project Appraisal Document, but their application has been too late and in some cases too limited in scope. It needs to be noted, however, that the Mid-Size Hydropower Projects component seems to be taking these criteria into account in an earlier stage – for example by selecting project options through multi-criteria analysis.
As far as the DSU is aware, the World Bank has acknowledged the general principles of the World Commission on Dams but has never formally adopted its criteria.

Did World Bank seriously apply its own safeguard policies?
Answer:
The fact is that the decision-making process on Inga has been fragmented and scattered in time. The decision-making process is now under time pressure related to the presidential elections in 2016 (the Government of DRC wants to organise a ground breaking ceremony in October 2015) (PAD p.37), which makes proper application of the safeguard policies (the right safeguard in the right moment) difficult.

Is the proposal in line with DRC's legislation on EIA/SEA, and does it correspond with international criteria in this field?
Answer:
As far as DSU is aware, the proposal is in line with the two legal texts on EIA in the DRC. The PAD refers to the DRC structures involved in EIA and ToRs produced.

What is your opinion on the argumentation of the NGO "International Rivers" in their letter of January 30, 2014?
Answer:
The DSU has the opinion that International Rivers is quite tendentious when they write that large amounts of river flow will be diverted – such a formulation seems to suggest that the water diverted is "lost" to the river – the proposed diversion is very local and flows will revert back to the original river channel within the local sphere of influence of the project.
The DSU fully agrees with International Rivers, however, when they write about the need for a Cumulative Impact Assessment. It is beyond doubt that Inga 3 is the precursor of the Grand Inga project. The existing World Bank policy should therefore be applied with respect to CIAs.
The DSU also agrees with International Rivers when they write that any assessment should include evaluating the impacts on the Congo estuary and the so-called "Congo Plume" in the Atlantic Ocean.

The approach appears to be dominated by energy interests, should it not be a 'nexus'-project?
Answer:
Inga is a typical single purpose energy project, for which links to other water related sectors does not seem urgent nor beneficial.

Could you do a reality check, as the documents of the Board often tend to be (too) optimistic?
Answer:

The reality check is reflected in the DSU's answers to the main questions of this advice.

Does the proposal connect to the national priorities of DRC?
Answer:
The DSU is not able to assess this without substantial research, for which time was not available.

Does the proposal fit within Dutch Development Cooperation policies?
Answer:
The DSU does not consider the proposal in conflict with Dutch Development Cooperation Policies but the final judgment on this questions is the competence of those politically responsible for this policy.

Can you assess the contribution by the IFI to donor-coordination: are the local stations involved, informed?
Answer:
The DSU is not able to assess this without substantial research, for which time was not available.

How do you appraise relevant political sentiments (for example consequences for support, commitment, implementation in the long term, sustainability)?
Answer:
The relevant political sentiments are reflected in the DSU's answers to the main questions of this advice.

How do you appraise relevant/notable positions of other donors/parties involved?
Answer:
From the documents, it is apparent that the interest comes mostly from the energy and hydropower sector.

Annex 1

DSU argumentation

Hydropower in Africa and Inga: Does Africa need hydropower?

Inadequate capacity in the power sector was the biggest infrastructure constraint identified in the comprehensive Africa Infrastructure studies under the World Bank, published in 2010[1]. Economic growth is crippled by shortages of electricity and the quality of life of 600 million Africans, who do not have access to electricity, is compromised. Installed capacity in Sub-Saharan Africa is only 68,000 MW, with South Africa accounting for over 40,000 MW.

Africa's resources for electricity generation consist of renewables (hydropower, solar, biomass etc) and thermal (natural gas, coal and petroleum). Of these, hydropower is the most significant by far. Total hydropower resource availability in SSA is approximately 380,000 MW, of which, less than 30,000 MW have been developed to date. Hydropower is the key to resolving the continent's power crisis because:

- *Large hydropower projects have significant economies of scale and should produce very low cost energy (of the order of 3 USc/kWh for Grand Inga, as compared with a long-run marginal cost in SAPP from all forms of generation of 7 USc/kWh).*
- *Hydropower is clean energy, avoiding the carbon emissions which the alternative of thermal generation would involve.*
- *Hydropower generation stations require far less maintenance than thermal stations and thus are more likely to be sustainable.*

These factors are evident from the large hydropower projects which were implemented in SSA in the past – Asokombo on the Volta River in Ghana, Kariba and Cahora Bassa on the Zambezi being cases in point. Unfortunately, Inga 1 (351 MW installed in 1972-74) and Inga 2 (1424 MW installed in 1981-82) in the DRC are the exceptions that prove the rule. Even the basic hydropower maintenance required, was neglected at Inga, and combined capacity declining from 1,775 MW to around 700 MW. These stations have in recent year's required extensive rehabilitation to restore their generation capacity.

Does DRC need Inga?

Inga is the epicentre of SSA's power generation potential. With a potential of 40,000 MW at a single site, Inga is unique and over the decades has given rise to grandiose schemes to ship cheap hydropower from the Cape, to Cairo and beyond, into Europe. Inga is a core component of the Southern African Power Pool (SAPP) least cost development plan.

The DRC needs the expansion of Inga in order to secure power for productive activities, particularly the mines in Katanga province in the south east of the country, and to expand access to electricity for its people. DRC has a population of over 70 million. Only 11% of who have access to electricity. Average per capita consumption is around 100 kWh per capita per annum, as compared with 520 kWh per capita per annum in SSA as a whole and 4,600 kWh per capita per annum in South Africa.

The DRC has other hydropower resources in addition to Inga. These are at sites with more 'normal' levels of potential, hence also lesser economies of scale and higher energy costs (of the order of 6.5 to 9 USc/kWh, as compared with ~3 USc/kWh for Grand Inga, though tariff for Inga 3 BC is likely to be considerably higher). In particular, there are a number of hydropower sites in Katanga province. With the passing of the new Electricity Law, which permits the private sector to develop power projects, the DRC Government is encouraging the mining companies in Katanga to develop these projects, either in their own right or by being the credit-worthy off takers for independent power producers (IPPs).

[1] Africa Infrastructure Country Dialogue studies, with the flagship report being published in 2010. http://www.infrastructureafrica.org/

Annex 1

Different costs and tariffs applicable in Katanga

Category	Tariff or cost
Large mine supply agreement tariff	3.5 c/kWh
HV tariff in force	4.7 c/kWh
HV tariff for SNEL viability (*)	5.5 c/kWh
New Katanga hydro (SNEL)	~6.5 c/kWh
SAPP LRAIC = value assumed for SAPM ERR calc. for electricity in Katanga (*)	8.7 c/kWh (7.0 c/kWh excl. transmission)
New Katanga hydro (IPP)	~9.0 c/kWh
Zambia imports	12.0 c/kWh

Source: Discussions with mining companies and for (*) items, the June 2012 World Bank Project Paper on *Southern Africa Power Market (SAPM)* project

Is management of the proposed project under a PPP the best choice?

Of more immediate concern than the social and environmental impacts of Grand Inga are questions about the realism of the proposed institutional arrangements for Inga 3. There is a significant risk that the project will take significantly longer than is envisaged in the Project Appraisal Document (PAD para 34 – financial closure by 2017 and first unit commissioning by mid-2021). It may well be, that it falters somewhere along the way, and gets delayed into the indefinite future.

In this context, it is prudent to bear in mind that Inga 3 has been discussed since the early 1980s, and began to crystallise after South Africa's democratisation in 1994. In the earlier concept, Inga 3 was to be a 3,500 MW project, premised on the bulk of the power being sold to members of the Western Power Corridor (WESTCOR) consortium (Angola, Namibia, Botswana and South Africa). A memorandum of understanding was signed between DRC and WESTCOR in 2004, with a company being formed and a costly pre-feasibility study for the proposed 3,000 km 400 kV interconnector that was carried out in 2005. Subsequently, DRC revoked the terms of the MoU, saying it had allocated the power to a smelter project in DRC, to be promoted by BHP Billiton. Inability to agree terms, however, led BHP Billiton to withdraw, and DRC had then to go back to the WESTCOR partners to secure the off-take arrangements, needed to finance Inga 3.

Such lack of respect for formal agreements and prevarication on the DRC side are symptomatic of a governance structure which is not conducive to investment being undertaken in the power sector. Yet the Inga 3 BC is based on the assumption that the project will be a successful public-private partnership (PPP) which will be brought to fruition through the technical assistance being provided by the TA Project which the World Bank Board is being asked to approve. Some pertinent considerations are as follows:

- *PPPs for power sector projects are notoriously difficult to negotiate, even for much smaller and simpler projects than Inga 3 BC, and by countries which are much stronger and better organised (DRC is designated as a 'fragile state' by both the African Development Bank and the World Bank). Also the process has to be competitive, but 2 of the 3 short listed consortia have members which are under World Bank sanctions (SNC Lavalin and Sinohydro).*

- *DRC has no real experience in this power PPP realm – as mentioned above, DRC has only recently introduced a new Electricity Law that allows private sector participation in the power sector. The law took a long time to be formulated and agreed upon. Even now, it is not clear, whether it has become effective through being signed by the President. Furthermore, there will be no investment in private projects until the legislation is underpinned by various regulations, which will take considerable time to formulate and gazette.*
- *Despite the lack of a legal framework for private participation, some mining companies have in recent years worked with the national electricity utility Société Nationale d'Electricité (SNEL) to improve power supplies. Katanga Mines is spending $320 million on a project, to refurbish generation and transmission capacity (the focus being 2 x 176 MW turbines at Inga), while Freeport McMorans has provided $170 million for the refurbishment of the 260 MW N'Seke hydro plant in Katanga and reinforcement of associated transmission lines.*
- *In 2013, in interviews, both companies expressed concern about the lack of capacity of SNEL to implement the projects. Various adjustments had to be made in the implementation arrangements to ensure delivery of the outputs. The managerial and financial weakness of SNEL is a major concern for the viability of Inga 3 BC and the ability of the World Bank project to deliver the PPP transaction that is envisaged.*
- *Because SNEL is not a credit-worthy off-taker, it is envisaged that only 1,000 MW of Inga 3 BC's capacity will be allocated to the national utility, thereby limiting the degree to which the economy and people of DRC can benefit from the expanded generation capacity. To provide the basis for debt financing of the project, the remaining 3,800 MW must be taken up by credit-worthy entities – this will be difficult to arrange and secure.*
- *In 2013, an inter-government treaty was signed, envisaging ESKOM of South Africa signing a power purchase agreement (PPA), covering 2,500 MW and the remaining 1,300 MW are to be taken up by financially robust international mining companies. One difficulty with this is that, according to the DRC Chamber of Mines[2], total mining demand in the main mining province of Katanga is only around 500 MW and is expected to have grown to 980 MW, by 2020. Some of this will already be committed to PPAs, to make the smaller IPP hydropower projects, the government is promoting in Katanga, bankable. Even if there were 1,300 MW of mining demand to be secured (elsewhere in DRC and not just in Katanga), it will be extremely challenging to get a number of disparate mining companies to commit to PPAs now which will only be effective many years in the future.*

The TA Project under consideration is part of the broader assistance that the World Bank is offering (for example through the Regional and Domestic Power Markets Project) to secure power for DRC and the southern African region. The DRC Government is also taking certain actions which point in the right direction – for example the comprehensive five-year program (2012-2017) for the financial and operational recovery of SNEL and the enhancement of SNEL's corporate governance (PAD para 15). However, this has been slow to get started, and its purported outcomes are by no means certain.

Has the right choice been made in the Inga 3 BC concept?

The much touted significance of Inga is not just that it has such large hydropower potential, but that the projects would be essentially 'run-of-the-river', requiring very little by way of civil works and hence obviating the environmental and social costs associated with large hydropower dam construction elsewhere in the world.

The earlier Inga 3 project was clearly run-of-the river, involving just the channelling of the water through the turbines, but the concept now is to divert the water into the Bundi valley and construct a

[2] Joseph Monga Besoin en énergie du secteur minier a l'horizon 2020.

100m high dam which will subsequently be raised (Inga 3 Haute Chute). In his comments, Eng van der Zaag considers this alternative to be essentially still run-of-the-river, but questions the proposal at a later stage to dam the Congo River itself. I fully agree with his comment on the International Rivers paper that it is inadequate to consider Inga 3 in isolation – a cumulative impact assessment for the whole of Grand Inga is warranted.

It is clear that Inga 3 BC will cause minor social and environmental impacts. It may in fact be one of the most environmental friendly projects with a capacity in the order of 4 GW. This is so, because Inga 3 BC does not involve the construction of a dam wall on the main river. It merely involves the diversion of some 6,600 m^3/s from the main river through a canal to a tributary, where a relatively small dam wall will create a relatively small reservoir from where water will flow through turbines to generate electricity and afterwards rejoining the river. According to the Preliminary ESIA report the residence time of the reservoir will be extremely short (18 hours) which is a measure of the potential impact on the flow regime, and indicates that Inga 3 BC is indeed a run-of-the-river scheme. This implies minimal impact on flow regime, sediment dynamics and biota (e.g. fish migration).

And Inga 3 Haute Chute?

However, the subsequent phases of Grand Inga, starting with Inga 3 HC, first of all, involves the construction of a dam wall on the main river. The environmental impact of constructing a dam wall across the main Congo River is of a completely different order, and will be much larger, than that of Inga 3 BC. Damming the main Congo River will

- *modify the flow regime (although this modification may be limited since the residence time of the water in the newly created reservoir may remain fairly short but I could not find in the Preliminary ESIA of Oct 2012 any details of the volume of the reservoir, the average residence time, only that the average water velocity is likely to be halved);*
- *largely affect the rapids in the main river locally (which can be compensated by a minimum flow, for which the Preliminary ESIA rather arbitrarily proposes a 10% flow of 4,000 m^3/s);*
- *affect the natural silt dynamics (but the Preliminary ESIA belittles this impact and simply states that the project impact in reducing sediment transport "should be very limited" but admits that "More detailed studies are recommended");*
- *create a barrier for fish migration (but the Preliminary ESIA doubts whether fish migration currently occurs, given the height, length and current of the rapids, but nevertheless recommends further "detailed scientific studies" … "to decide whether a dedicated structure would be useful and necessary"; and recommends to consider building a fish ladder connected to spillway 1).*

<u>The preliminary ESIA</u>

As the World Bank appraisal report is (supposed to be) informed by the Preliminary ESIA, it is important to assess the quality of that Preliminary ESIA.

After the -seen the limited time available-, very quick scan the DSU has the impression that the Preliminary ESIA report (apart from issues mentioned under 3.1 1 through 5) is not appropriately addressing the following:

Have environmental issues sufficiently been assessed?

- *The ESIA mainly focuses on the local downstream impact of Inga 3 HC (e.g. the reduced flow over the rapids at Inga). What the impact of Inga 3 HC is on the downstream flow regime (and what the residence time (or detention time) is of the reservoir created by Inga 3 HC) is*

in my view only lightly assessed, but not based on locally derived data and specific knowledge on the Congo river.

- *It remains unclear what the impacts of the altered silt and sediment dynamics will be on downstream areas, including off shore on the "Congo plume" in the Atlantic Ocean, although the report states that this will be minor (p. 346-347).*
- *It remains unclear what the impact on biota and in particular fish will be, and it remains debatable whether physical structures could mitigate these impacts.*
- *The 10% "environmental flow" remaining to flow over the rapids, appears to be a totally arbitrary percentage, not based on any understanding of local processes.*
- *The safety issues related to the dam remain unconvincingly addressed. Apparently the preliminary design is based on a 100 year flood, which seems to be inadequate and risky.*

Is benefit sharing made credible?

It remains unclear to the DSU to what extent local people, in proximity of the works and negatively affected in various ways by the project, will benefit from the project. One solution would be to give local people, and all others somehow affected, equity/shareholding in the venture and/or guarantee them access to electricity at an affordable rate.

Overview – alternatives

The first main question the working group is asked to address, relates to whether the documentation received adequately and correctly permits an assessment of the level of social, environmental and economic sustainability of the Inga 3 BC and Inga 1-8 in comparison with alternative power generation. The precise answer to this is 'no', but it would be unreasonable to require alternatives to a project such as Inga to be elaborated in a way to permit direct comparison. Inga is in a league of its own – in terms of resource potential, there is no power generation option to rival it on the African continent.

That said, resources are only a start: as will be discussed in more detail below, the viability and sustainability of Inga 3 is a function of the detailed design of the project, and the adverse institutional, regulatory and governance context for its implementation. If Inga 3 does not go ahead at this juncture, the alternative for DRC and the region is to develop other large hydropower projects, such as Mphanda Nkuwa, Cahora Bassa North and Batoka on the Zambezi, backed by transmission investments to strengthen the regional grid to allow enhanced levels of power trade.

At a high level of analysis, these alternative options (together with the development of some smaller hydropower projects in Katanga) would appear to be a more economic and practical approach in the short to medium run. This strategy would better assure the real significance of Inga 3 BC, which is that it is the first stage of a sequence of projects which should eventually deliver a very significant amount of clean, low cost power.

Have promising alternatives been overlooked?

As to the possible alternatives, both the ESIA and the World Bank appraisal document do not seriously consider possible alternatives to the Inga 3 BC and Inga 1-8. DSU thinks this is a major weakness. It appears that a kind of tunnel vision has crept in these reports where the Grand Inga concept is viewed as the only possible development option, although, indeed, Inga is in a league of its own – in terms of resource potential, there is no power generation option to rival it on the African continent.

That said, resources are only a start: as will be discussed in more detail below, the viability and sustainability of Inga 3 is a function of the detailed design of the project, and the adverse institutional,

regulatory and governance context for its implementation. If Inga 3 does not go ahead at this juncture, the alternative for DRC and the region would have to develop other large hydropower projects, such as Mphanda Nkuwa, Cahora Bassa North and Batoka on the Zambezi, backed by transmission investments to strengthen the regional grid to allow enhanced levels of power trade. At a high level of analysis, these alternative options (together with the development of some smaller hydropower projects in Katanga) would appear to be a more economic and practical approach in the short to medium run. This strategy would better assure the real significance of Inga 3 BC, which is that it is the first stage of a sequence of projects, which should eventually deliver 40,000 MW of clean, low cost power.

Figures for costs for Zambezi projects:

	MW	***EPC $b***	***$/kW***
Batoka	*1,600*	*4.3*	*2,679*
Mphanda Nkuwa	*1,500*	*2.5*	*1,648*
Cahora Bassa Norte	*1,245*	*0.771*	*619**

Data is from recent Irena publication and refers to engineering, procurement and construction contract values, excluding transmission lines. http://www.irena.org/DocumentDownloads/Publications/SAPP.pdf
** Comparable figure for Inga 3 BC is $6.2 b ($1,292/kW). Note, however, that this Cahora Bassa Norte option requires Mphanda Nkuwa to be in place. So the Inga 3BC investment cost cannot be compared with the cost of Cahora Bassa Norte.*

One alternative, that should have been seriously considered, is the Grand Inga WITHOUT A DAM ON THE MAIN RIVER, which should be possible, given the natural high base flow and the natural large head. This would nevertheless significantly reduce the potential energy generating capacity (namely 35 m less head; perhaps halving the total potential capacity; but still remaining with perhaps 20 GW capacity, i.e. similar to Three Gorges), but it would also minimise some of the observed impacts due to the dam and the reservoir on the Congo.

Given the staged implementation of the Grand Inga project, it would be wise to carefully consider the order in which the various parts will be implemented, to avoid lock-in, to ensure no regret investments, to benefit from incremental learning over time while implementing the first stages of the project, and to be able to respond to broader socio-economic, political and geopolitical developments that will occur over the years that implementing these parts will take. This would require a thorough insight in all the details and aspects of the various building blocks and conducting scenario analyses.

Annex 1

Have gender aspects in PAD and Preliminary ESIA been properly addressed?

A number of documents has been reviewed[3] to assess the extent to which attention has been paid to gender equality in the World Bank TA proposal concerning the INGA3 project in DRC, in view of the main questions which the DSU is requested to address.

The following findings of the review can be reported about the Technical Assistance Project Appraisal Document[4]:

1. *It does not refer, directly neither indirectly, to gender or women's issues in the various phases of the proposed TA project and the proposal as a whole. Importantly, this also applies to the subcomponents under the TA project focus on various studies 'to update and complement the preliminary ESIA which was prepared as part of the feasibility study.' – Which will include the ESIA and the associated Resettlement Action Plan for the transmission lines in DRC – and 'the definition of a community plan (…) and the preparation of a resettlement action plan for the Camp Kinshasa settlement.' (par.58 p.12). No reference is made to one of the preliminary ESIA, Volume 4,[5] which gives extensive information about the socio-economic context/ livelihoods of the local population in the different areas of the Inga3 development and the transmission lines and the impact of the proposed development. This volume pays attention to the division of labour between men and women; men's and women's access to resources (related to forest products, fishing) and decision making processes; and organisations of men and women. It specifically emphasizes the importance to include women, for instance in consultations, compensation procedures, etc.[6]*
2. *It does not refer to men's and women's issues in the elaboration on how safeguards policies are triggered and additional studies and frameworks that will be undertaken (par.141 – p.149, p.27-29)*
3. *It does not refer to efforts to specifically hear the voices and concerns of women, both who live in the Inga3 development area and potential energy users (consumers) in the DRC.[7]*
4. *It does not refer to the capabilities of both government institutions (to be) involved as well as the civil society organisations that are (proposed to be) involved in the process, more especially as watchdog,[8] to include men's as well as women's points of view, promote equal opportunities for men and women and address inequality issues.*

Conclusion 1**: in view of the above, **it cannot be assessed to what extent

- *women relative to men will be **affected by** activities related to the construction of the proposed Inga3 BC infrastructure and the clearing around the transmission lines (1850 km – par.38 p.8), including resettlement. The proposal states in general terms that 'Local communities around*

[3] See the footnotes below.

[4] IDA. 22 January 2014. Project Appraisal Document. Democratic Republic of Congo, Inga 3 Basse Chute and Mid-size Hydropower Development Technical Assistance Project

[5] AECOM-RSWI/EDF. October 2012. Société National d'Electricité (SNEL). Preliminary Study of Inga Hydroelectric Site Development and Associated Power Interconnections. Feasibility Stage. Social and Environmental Impact Study Report. Volume 4.

[6] Unfortunately, the Monitoring and Evaluation Plan proposed in this volume (p.446 and further) is not sex-differentiated.

[7] The proposal mentions that 'a participatory process at local and provincial level, including dialogue with private sector, civil society representatives, and development partners has validated the project scope. The consultative approach has established an ongoing, accessible dialogue with potentially affected populations and other stakeholders so that their views could be fed-forward in decision-making processes related to the TA project.' (par.138, p.27)

[8] e.g. par.89, p.18; par 112, p.22

Inga will benefit from fair compensation, local development and job creation' – not further defining what 'fair' means. (par.35, p.7). It further speaks of Involuntary Resettlement and Indigenous Peoples without paying attention to gender issues. The preliminary ESIA, Volume 4, addresses this issue of impact (including complaints mechanism), specifically referring to women as one of the vulnerable groups (e.g. p.417, 442).

- *women's **concerns** compared with those of men have been heard and taken into account.[9] The proposal mentions that great care will be taken to develop a consultation and communication strategy for the Inga3 BC development[10]. This point is even more critical where it concerns the private sector: 'the power station and the transmission lines in DRC will be developed, designed, financed, constructed, and operated by a private consortium under a concession contract' (par.44 p.10) – how can it be assured that both men's and women's concerns will be taken seriously? The preliminary ESIA, Volume 4, addresses this issue of women's involvement (e.g. p.442, 445, 450).*
- *women relative to men will be affected by the effects/ impact of the INGA3 hydropower development in terms of their **livelihood**. Reports point at the negative effects on the biodiversity and (marine) ecosystems[11], which may have an impact on gathering, fishing and processing/ marketing of forest products and fish. The preliminary ESIA, Volume 4, describes the diverse roles of men and women in the concerned zones, from which it can be assumed that the impact of the hydropower development will be different for men and women.*
- *women relative to men will **benefit** from energy services to households and businesses. The question can be posed whether in view of the different socio-cultural opportunities of men and women, efforts will be made to promote equal access to such services and to hear the views of women and men about such services (par. 27, p.6 of the TA Proposal: new electricity access for seven million people in the Grand Kinshasa and two million people in the hinterland).*

***Conclusion 2:** In view of the lack of attention to gender issues in the proposal as a whole, and in the safeguards policies in particular, it cannot be assessed to what extent the TA project will mitigate the negative effects of the Inga3 development on women's livelihood and opportunities relative to those of men and, to take the issue a step further, to promote gender equality. The latter is even more critical because of the different stakeholders involved, among which the private sector: 'the power station and the transmission lines in DRC will be developed, designed, financed, constructed, and operated by a private consortium under a concession contract (par.44 p.10).*

[9] The TA proposal mentions that two public hearings/ consultations were held in which CSOs and local leaders were involved but it does not indicate men's or women's participation nor concerns (par.139 p. and p.65, 66.)

[10] par.66 p.13, par.89, p.18; par.136-140, p.138, 139.

[11] Peter Bosshard, International Rivers. 28 January 2014. Congo River: Death by a Thousand Cuts? Flaws in the Proposed Environment Impact Assessment for the Congo's Inga Dams. Letter of Peter Bosshard to Mr. Frank Heemskerk, Executive Director, The World Bank, dated January 30, 2014

Annex 1

Have the PAD and Preliminary ESIA been based on WCD criteria?

An assessment of the Preliminary ESIA and the World Bank's Project Appraisal Document based on the World Commission on Dams' criteria reveals a number of gaps in these documents with regard to social and environmental issues. Although most of the mechanisms that the WCD suggests for taking into account social and environmental issues are mentioned in these documents, they are often introduced at too late a stage. The WCD describes the stages of needs assessment and selection of alternatives as stages in which such issues should specifically be taken into account, but the Project Appraisal Document indicates that most of them are planned as future components of the project – when needs assessment is a stage long-passed and selection of options has already been done.

Neither of the documents refers to a needs assessment as part of the preparations for this project. In fact, the project seems inspired by the promising potential for hydropower generation (e.g. by the supply side) instead of a well-defined need or demand. It remains unclear who will benefit from the project, as the Product Appraisal Document alternately mentions local users in the DRC and users in South Africa and other countries in the SAPP (South African Power Pool).

The same obvious suitability of the site for hydropower generation may have led to a too easy omission of alternatives. For Inga 3 – low head, one alternative is described in the preliminary ESIA. The document presents a comparison of the selected technical option and the discarded 'tunnel' option, but assesses it merely on technical criteria, without paying attention to social and environmental effects. Despite the fact that the tunnel option scores better on all except one criteria, this option was not selected due to the risks of underground operations, including 'geological and technical hazards' and 'risks of not meeting completion dates'. Concerning these completion dates, the Project Appraisal Document indicates that the possibility for a groundbreaking ceremony during the 2016 presidential election campaign was an important consideration: start of construction works by that time is only possible for the selected option.
Consideration of alternatives for other project components is described superficially in the Project Appraisal Document and the Preliminary ESIA. For Inga 3 – high head, it seems that no alternative is seriously considered – the ESIA mentions the option of a number of smaller schemes instead of one large construction, but does not elaborate on this.

Involvement of stakeholders is an important component of various WDC criteria. The Project Appraisal Document describes two stakeholder meetings and the Preliminary ESIA indicates that there have been meetings with representatives of villages nearby the Inga site. These meetings however have been held long after the needs assessment and the selection of options, and appear to have the purpose of informing rather than consulting the public.

In general, social and environmental aspects have only superficially been taken into account in project development so far. Full-fledged ESIAs are yet to be conducted. In the current Preliminary ESIA, environmental and social issues Inga 3 – low head are considered 'less relevant' because of the 'limited surface area of the reservoir to be created on the Bundi River'. Due to this assumption, a number of environmental and social aspects that are mentioned elsewhere in the report are too easily omitted. For example, the report indicates that the land in the Bundi valley that is to be submerged belongs to clans and is partially used for production, but the project proposal contains no clear measures to compensate for this. An environmental concern could be the fish mortality of '5-90%' due to the turbines, which is not considered to be an issue of interest. The limited attention to social and environmental impacts in the current Inga 3 – low head phase is moreover due to the fact that effects of Inga 3 – high head are considered beyond the scope of 'low head' effects. It should be realised, however, that the 'low head' phase clearly paves the way for next stages of Inga hydropower

development; 'high head' effects such as the replacement of over 10,000 people could therefore be considered as cumulative effects of the current phase.

Conclusion:
Many aspects of the WCD criteria are in one way or another included in the Preliminary ESIA and/or Project Appraisal Document, but their application has been too late and in some cases too limited in scope. It needs to be noted, however, that the Mid-Size Hydropower Projects component seems to be taking these criteria into account in an earlier stage – for example by selecting project options through multi-criteria analysis.