

# **Benefit Sharing and Hydropower:**

Enhancing Development Benefits of Hydropower Investments Through an Operational Framework

# **Final Synthesis Report**

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A Sweco Report for The World Bank



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# FOREWORD

This report is the Synthesis Report of the project – Benefit Sharing and Hydropower: Enhancing Development Benefits of Hydropower Investments Through an Operational Framework. It includes a summary of the various deliverables provided the World Bank as part of the study, the most important being 5 discussion notes (theoretical framework) and 6 focal Case Study Reports (Lesotho Highlands Water Project, Khimti 1 HPP - Nepal, Angostura HPP – Costa Rica, San Carlos – Colombia, Glomma & Laagen basin – Norway and Nam Theun 2 HPP – Laos). The work has been undertaken by Sweco Norway for the World Bank, and for the Case Studies we also were provided inputs from the project owners/proponents as well as key stakeholders. An extended dialogue with the World Bank staff has also taken place in framing and developing the study, with Daryl Fields, Elena Correa and Chaogang Wang being the focal resource persons. Authors of this synthesis report are Mr. Leif Lillehammer, Mr. Orlando San Martin and Dr. Shivcharn Dhillion. Additional local authors that provided input to the case studies and summary's of them in this report are Mrs. Vuyani Tsabalala Monyake (LHWP), Dr. Bhim Subedi (Khimti 1 HPP), Ms. Somchay Soulitham (Nam Theun 2 HPP), Mr. Johnny Rosales Córdoba and Mrs. Laura Rodríguez (Angostura HPP) and Mrs. Ana Maria Arias and Claudia Lucia Alvarez (ISAGEN/San Carlos HPP). Additionally Mr. Wiliam Rex (World Bank, Lao PDR) has provided valuable input on the Nam Theun 2 HPP case study, as well as Marco Scuriatti and Marcus Wishart (World Bank, Pretoria) for the LHWP. Extended dialogue with the project proponents has also provided valuable input to the report and these are as follows: Nepal HPL/SN Power (Nepal); LHWC/LHDA (Lesotho/RSA); ICE (Costa Rica); ISAGEN (Colombia); NTPC (Lao PDR) and GLB (Norway). Finally, national and regional stakeholders have also provided input to the case studies, especially during the stakeholder workshops for each case.

# ABBREVIATIONS

ADB	-	Asian Development Bank
AESNP	-	AES Nile Power Limited
BID	-	Inter American Development Bank
BIU	-	Bujagali Implementation Unit
BOOT	-	Build Own Operate and Transfer
BS	-	Benefit Sharing
CA	-	Concession Agreement
CBD	-	Convention on Biological Diversity
CBO	-	Community Based Organization
CBT	-	Colombia Basin Trust
CDAP	-	Community Development Action Plan
CDP (PDC)	-	Community Development Programs
COMCURE	-	Multiregional Reventazón Watershed Commission
CSR	-	Corporate Social Responsibility
DRIFT	-	Downstream Response to Impounded Flow Transformations
EAP	-	Environmental Action Plan
EIA	-	Environmental Impact Assessment
EDF	-	Electricity de France
EDL	-	Electricity de Lao
EGAT	-	Electricity Generating Authority of Thailand
EGCO	-	Electricity Generating Public Company Limited
EMP	-	Environmental Management Plans or Ethnic Minority Plans
ERAV	-	Electricity Authority of Vietnam
ESIA/SEIA	-	Environmental and Social Impact Assessment
ESMP	-	Environmental and Social Management Plans
ESP	-	Environmental Service Payments
ESRA	-	Environmental and Social Risk Assessment
FI	-	Financial Institution
FONAFIFO	-	National Forest Office
GHG	-	Greenhouse Gasses
GoL	-	Goverenment of Lao PDR
GoU	-	Government of Uganda
GoV	_	Government of Vietnam

G&L	-	Glomma and Laagen
GLB	-	Glomma and Laagens Water Management Association
HAD	-	High Aswan Dam
HPL	-	Himal Power Limited
HPP	-	Hydropower Project
ICE	-	Instituto Costarriense de Electricidad
ICOLD	-	International Commission of Large Dams
IFR	-	Instream Flow Requirements
ITCR	-	Costa Rican Institute of Technology
IWRM	-	Integrated Water Resources Management
JITDA	-	Jinja Tourism Development Authority
KECU	-	Khimti Environment and Community Unit
KREC	-	Khimti Rural Electricity Cooperative
LFCD	-	Lesotho Fund for Community Development
LHDA	-	Lesotho Highlands Development Authority
LHSE	-	Lao Holding State Enterprise
LHWC	-	Lesotho Highlands Water Comission
LHWP	-	Lesotho Highlands Water Project
MDG	-	Millennium Development Goals
MW	-	Megawatt
NEA	-	National Electricity Authority
NGO's	-	Non-governmental organisations
NNT NBCA	-	Nakai-Nam Theun National Biodiversity Conservation Area
NTEC	-	Nam Theun 2 Elictric Company
NTPC	-	Nam Theun Power Company
NT2	-	Nam Theun 2
OMVS	-	Organisation for the Development of Senegal River
ORASECOM	-	Orange Senqu River Commission
PAP	-	Project Affected People
PAR	-	Population at Risk
PES	-	Payment for Ecosystem Services
PPA	-	Power Purchase Agreement
PPP	-	Public Private Partnership
RAP	-	Resettlement Action Plan

RSA	-	Republic of South Africa
SA	-	Stakeholder Analysis
SAP	-	Strategic Action Plan
SDP	-	Social Development Plans
SEA	-	Strategic Environmental Assessment/Social and Environmental
		Assessment
SEMFOP	-	Social and Environmental Management Framework
SINAC	-	Sistema Nacional de Areas de Concerviacion
SLO	-	Social License to Operate
SME	-	Small and Medium Enterprises
SWAP	-	Sector Wide Approach
ТСТА	-	Trans Caledon Tunnel Authority
ToR	-	Terms of Reference
TWh	-	Terra-watt hours
UETCL	-	Uganda Electricity Transmission Company Limited
UN	-	United Nations
UNEP	-	United Nations Environmental Programme
USD	-	United State Dollar
VCD	-	Village Development Committee
WB	-	World Bank
WCD	-	World Commission of Dams
WMPA	-	Watershed Management Protection Authority
WUA	-	Water User Associations
WWR	-	White Water Rafting

# **EXECUTIVE SUMMARY**

#### Introduction

After a hiatus of roughly a decade - and much debate as to its legacy and contribution to poverty and development - the World Bank has scaled up its investment in hydropower. Poverty eradication and the MDGs cannot be achieved without providing developing countries with the needed infrastructure among which hydropower is a basic component in several different parts of the developing world. Hydropower will also likely play a key role in climate adaptation as a renewable source of energy which can contribute to the reduction of GHG and to adaptation to changes from the foreseen increase in hydrological variability, e.g. help mitigate drought and floods. Furthermore, from the lessons learned of the past decade or so, hydropower is increasingly recognized as providing multiple opportunities to significantly enhance community, regional, national and transboundary development if planned, designed and implemented in a sustainable manner. Within this development benefit sharing has evolved over time as a core concept related to implementation of the principles of sustainability.

As a concept benefit sharing can be traced back to its origin in two UN resolutions some 30 years ago; e.g. the Agreement governing the activities of states on the Moon and other celestial bodies (1979) and the Convention on the Law of the Sea (1982).Ten years later, benefit sharing was introduced as a core concept in the objectives of the Convention on Biological Diversity (CBD 1992). The latter was followed up in 2002 by drafting of the "Bonn Guidelines", e.g. 187 parties to the CBD adopted the voluntary *Bonn Guidelines on Access and Benefit Sharing*. The Bonn Guidelines set out to establish a basic model for ABS (Access and Benefit Sharing), whereby individual users and providers of genetic resources are allowed to come to an informed agreement about how the resources will be used and how the benefits will be shared (UNU/IAS 2003).

Related to hydropower and water resources development, sharing of costs and benefits more equitably, e.g. Benefit Sharing, was recognized by the World Commission of Dams (WCD 2000) as one of their seven priority issues for improving decision making and the management of dams and their alternatives. Under the WCD New Policy Framework, the Strategic Priority reads - Recognising Entitlements and Sharing Benefits. Although much of the statements of WCD under this strategic priority are leaned towards traditional mitigation, resettlement and development entitlements, clause 5.4 reads "Adversely affected people are recognised as first among beneficiaries of the project. Mutually agreed and legally protected benefit sharing mechanisms are negotiated to ensure implementation" (WCD 2000a). Concurrently and after the WCD various other initiatives and publications has dealt with, analysed and described benefit sharing related to hydropower and water resources development (see for example Sadoff and Grey 2002, 2005, Grey and Sadoff 2007, Phillips et al. 2006, Quadumi 2008 and Teshome 2009). A huge sampler of the above work, and other literature, is at a theoretical level. Let alone the importance of that, this also needs to be properly anchored at a practical level for investments in hydropower and other water developments to take place under a benefit sharing framework.

Thus in 2008, the World Bank initiated deeper exploration of benefits-sharing in the hydropower sector. A framework for making benefits-sharing more operational was drafted; a review of literature completed and two workshops were hosted by the World Bank; a

meeting of experts and a technical workshop for experts and project managers. The results of these activities were; (i) a concept note (October 2009); (ii) a literature review (May 2009) undertaken by Mott MacDonald and; (iii) the transcript of meeting of experts and technical workshop of June 2008.

### Methodology

The World Bank further extended the BS program, by assigning Sweco in supporting them, to explore lessons learned and best practice through the project - Benefit Sharing and Hydropower Development. At the start of this project a methodology for assessing benefit sharing mechanisms and range of mechanisms implemented was elaborated. This has extensively been used in 6 selected case studies and 4 additional desk review studies; whilst synthesizing lessons learned and best practice at the end. Additionally 5 concept notes on pertaining benefit sharing issues (see Chapter 3 for summaries) have been elaborated to clarify them, spark dialogue and discussions, and eventually expand on new ideas. The notes constitute the following:

- Discussion Note 1 A working definition of enhancing and sharing development benefits
- Discussion Note 2 Benefits-sharing mechanisms
- Discussion Note 3 Governance Options
- Discussion Note 4 Economic Assessment of Enhancing Benefits
- Discussion Note 5 Social and Development Benefits

Selection of focal case studies was undertaken in a sequential manner that required several steps and re-iterations also in close dialogue with the World Bank staff. Criteria's for selection were heavily based on the framework outlined in the Concept Note (2009), with some adjustments/additional inclusions (see also Chapter 2.3 for details).

From the ranking process and an extended dialogue between the Consultant and the World Bank the following Focal Case Studies were selected for an in depth assessment.

- 1. Lesotho Highlands Water Project (LHWP), Lesotho/RSA
- 2. Khimti 1 HPP, Nepal
- 3. Angostura HPP, Costa Rica
- 4. San Carlos HPP, Colombia
- 5. Glomma and Laagen Basin (G&L basin), Norway
- 6. Nam Theun 2 HPP, Lao PDR

Each study included a field trip that precipitated in consultative processes with key stakeholders resulting in a Case Study Report (see Chapter 2.4). To support and extend the findings of the 6 focal case studies above, we also included an extended desk study review of additional international HPP/Multipurpose and river basin development projects, especially those that would add value on benefit sharing mechanisms that may be implemented in developing economies. Results from this simpler desk review are also summarized in Chapter 4.2 together with the focal case studies. The selected cases for the desk review were:

- 1. Bujagali HPP, Uganda
- 2. High Aswan Dam, Egypt

- 3. A'Vuong HPP, Vietnam
- 4. Columbia Basin and Columbia Basin Trust, Canada/USA

# **Defining Benefit Sharing**

### A Working Definition

A working definition of benefit sharing with its associated typology of mechanisms should be consistent with sustainability and aim for distributing social, economic and environmental benefits to the widest possible range of stakeholders at stake in any (new) hydropower/water infrastructure development. The benefit sharing mechanisms should also work across spatial and temporal scales, e.g. from local to national and further transnational level (where relevant), and also consist of a mix of short, medium and long-term benefit portfolios. Lastly, the working definition with its associated mechanisms needs to, where relevant, be framed within the concept of IWRM in a basin wide context to cater for sharing of benefits between multiple interests in an integrated manner. Thus our proposed working definition is as follows:

"A framework for governments and project proponents to maximize and distribute benefits across stakeholders, through relevant spatial and temporal scales by use of various mechanisms, and consistent with the principles of sustainability<sup>1</sup>"

Given this definition it is expected that it will assist in distribution of benefits in a fair, equitable and timely manner to the relevant stakeholders at stake, as defined in the box to the right, in any given new HPP and water infrastructure development.

#### Who are the stakeholders that should benefit?

Most commonly;

- Local communities
- Displaced people
- Local/Regional Government
- Project Owners
- National Government

#### And where relevant;

- Transnational and River Basin Organisations
- Special Interest Groups
- Private Sector

<sup>&</sup>lt;sup>1</sup> The principles of sustainability are outlined in Appendix 3.

#### Spatial and temporal scales: What are they?

**Spatial scale** refers to the scale of geographic coverage the benefit sharing mechanisms of a HPP/water infrastructure project has (as such it also has a demographic component tied to it; e.g. population size). Spatial scale in a project can thus refer to (from small to large subsequently); local communities; municipalities/counties; watershed and river basins; region and nationwide; cross county/transnational (note that river basins can be transnational and that especially watersheds can reside within municipalities and counties).

**Temporal scale** relates to at which timeline the various benefit sharing mechanisms are working; e.g. on short, medium and long term scales. A sustainable project should have mechanisms working at all scales. It is important to note that it should be *the pool of mechanisms* from a project that needs to work across these various time scales, since mechanisms may have various timespans, and some mechanisms need to be in place before others can function. Further to this is when in the lifeline of investment projects different benefit sharing mechanisms should be considered and implemented; e.g. during planning, construction, operation and beyond.

# Compensation vis - a - vis Benefit Sharing

The compensation vis-a-vis benefit sharing is a significant issue that needs to be discussed and elaborated further as it is central to long term sustainability of HPP development. The dilemma remains in distinguishing where the line is to be drawn, as this also can be case/project specific. Normally mitigations are to be found in commitments related to the EIA and license processes, either in international guidelines or more specifically in national legislations and regulatory processes. Benefit sharing goes beyond these commitments with focus on enhancing community development related to opportunities created by the projects instead of only mitigating impacts.

In several of the case studies the complementary investments undertaken by the proponents/project owners do fall within the scope of benefit sharing mechanisms (e.g. LHWP, Khimti 1 HPP, Angostura HPP, San Carlos HPP, Nam Theun 2 HPP, Bujagali HPP and Columbia Basin. Some elements that allow characterizing them as such are: (i). beneficiaries are spread over the project influence area and are not limited to the directly affected population; and (ii) the extent of the areas of intervention, in most of these cases (sectors including education, promotion of economic activities, human rights, health etc.) appear to extend well beyond the compensation of direct/indirect impacts of hydropower construction and operation. Below is a schematization intended to illustrate the relationship and differences between traditional compensation and mitigation measures compared to benefit sharing.

Overleaf is a schematization intended to illustrate the relationship and differences between traditional compensation and mitigation measures compared with benefit sharing<sup>2</sup>.

<sup>&</sup>lt;sup>2</sup> Adapted from the NT2 HPP Case Study in chapter 4.1.6.



Flow chart showing measures which go beyond their expected obligatory limits in quality and time (PES is Payment of Ecosystem Services).

# **Benefit Sharing Mechanisms**

# **Definition of Typologies**

To enable operationality of the working definition of benefit sharing presented above a defined framework that enables for implementation is needed. Thus a framework, with typology of mechanisms has been elaborated. Mind that our theoretical assessment and findings from the case studies has lead to a somewhat more refined typology than earlier initiatives<sup>3</sup>; and can be characterized as in the table below. The table also refers to the importance of the various typologies across spatial and temporal scales.

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Typology	Description of Specific Mechanisms	Spatial Scale Dependency	Temporal Scale Importance
Project Design and Operations	Maximize benefits of flexible infrastructure and integrated resource management. E.g., multi-purpose infrastructure (flood control, irrigation, navigation, water supply, water quality improvements), integrated cascade management of reservoirs, managed flows.	Increasingly important for larger and more complex project developments.	Heavily confined to long term and most important during construction and operation.

<sup>&</sup>lt;sup>3</sup> The WB Concept Note (2009) for example uses 4 main typologies, namely; Project Design and Operations; Ancillary Investments; Financial Allocations; and Policies, Institutions and Capacity Building.

Typology	Description of Specific Mechanisms	Spatial Scale Dependency	Temporal Scale Importance
Ancillary Investments	Investments outside core infrastructure to a broader reach of benefits. (i) <u>Physical</u> <u>infrastructure investment</u> : This include all (upgrading or creating new) infrastructure investments undertaken by the project owner directly or indirectly related to the construction or operation of the HPP/Water Infrastructure; e.g. roads, bridges and other project related facilities e.g. and (ii) <u>Socio-Environmental investments</u> : These are investments not always directly related to the main project structures. For example, social infrastructure (schools, health facilities and systems), community programs (job creation and enhancement, agriculture and livestock production enhancement, SME), watershed protection investments (catchment treatment, erosion management, afforestation e.g.), tenure security.	Most important at local communities, municipal/county scale, and beyond especially with roads. Most important at local communities and municipal/ county scale and watershed/river basin scale if investment is in protection.	Heavily confined to long term and most important during construction and operation. Works across all temporal scales. Implementation of mechanisms is most important during planning and construction.
Direct payments/ disbursement	Legally binding transfers related to royalties, taxes, license fees, development funds, preferential rates, revenue sharing. (Assurance of the mode of use of funds has to be ear-marked).	Works across all spatial scales depending on project.	All mechanisms but development funds in this typology is generally long term. Development funds can either be short, medium or long term.
Institutions and Capacity Building (Can also be a key enabler for benefit sharing)	Build enabling environment for leveraging benefits within institutions and amongst stakeholders. For example; knowledge sharing, river basin organizations, SME development, development planning capacities, joint ownership.	Important for organizations at all levels; from local to trans- national. Thus all spatial scales.	Heavily confined to long term and important during planning and decision-making (for participatory and ownership aspects), construction and operation.
Policies and Regulatory framework (Is also a key enabler for benefit sharing)	Legally binding mechanisms (laws, acts, concessions, licenses, Treaties) for distributing benefits across stakeholder groups. (Policies and regulations may for example trigger direct payments and disbursements).	Works across all spatial scales depending on project.	Heavily confined to long term and important during planning due to its function often as an enabler for benefit sharing.

The typology Policies and Regulatory framework can come in two *forms*. These are either as; (i) an enabler of other mechanisms (e.g. a meta-mechanism) or; (ii) as a mechanism that is spurred by a project. In the *first form* the enabler function is very often the prerequisite for other mechanisms to function, e.g. for example for direct payments/disbursement in the G&L and LHWP cases and for institutions and capacity building in the LHWP case. In the *latter form* a project can work towards having a new mechanism/policy put in place that for example ensures royalty payments to central government and/or local communities.

Similarly, stakeholder engagement, formation or strengthening of local institutions (e.g. CBOs) and public-private partnerships (PPP) can be central in acting as enablers to define and implement benefit sharing. In several of the cases in this study the above were important foundations and pillars for making the benefit sharing mechanisms operational. Core to this is increasing the capacity of the stakeholders in question, so that they can engage in the benefit sharing mechanism itself. In several of the cases, *capacity building* increased the ability of the stakeholders to make decisions, implement and maintain projects seeded through benefit sharing process. See also the section on key enablers below for more details.

# Combining Different Types of Mechanisms (portfolio approach for benefit sharing)

A portfolio based approach can secure that a combination of mechanisms works at different spatial and temporal scales as discussed earlier. This approach has been undertaken in a variety of the case studies; i.e. several mechanisms are used to satisfy the wide range of needs and expectations raised by stakeholder's at large and/or local communities. This is paramount and works across trans-national, national and local scale for the LHWP (regulatory framework, institutions, financial allocations, ancillary investments e.g). For Nam Theun 2 HPP and A'Vuong HPP legal and institutional frameworks/arrangements are closely linked to benefit sharing initiatives at local level, e.g. community development and enhancement and various ancillary investments to enhance livelihood. For Angostura HPP and San Carlos HPP case studies, the two watershed management initiatives are supported by the project owners; and watershed management plans/programs are in fact "portfoliobased" interventions, which may include, among other actions; capacity building, institutional support, and ancillary investments.

A general lesson however from the case studies is that a portfolio based approach has not been pre-conceived by the project proponent/government, but is rather a result of especially mitigation extensions and development needs. Pre-conceived portfolio based approaches, and the implementation of them, might however be the result of the current benefit initiative, in the way we have been grouping them in our study.

# Key Enablers for Benefit Sharing

There are several *enablers* triggering the interest and need for benefit sharing in the development of hydropower and water resources infrastructure. The four most important are; (i) policies and regulatory framework; (ii) stakeholder engagement and community participation; (iii) partnership formation, and (iv) institutions and capacity building. These are fundamental for making benefit sharing operational and thus for the implementation success of various benefit sharing mechanisms.

- Policy and regulatory framework
- Stakeholder engagement and communication
- Partnership formation
- Institutions and Capacity building

KEY ENABLERS or PRECURSORS FOR BENEFIT SHARING PROJECTS

#### Policies and Regulatory Framework

The various case studies indicate that having a strong policy and regulatory framework becomes more important when distributing benefits at larger scales and especially between nations as in the case of the LHWP and the Columbia basin. The G&L basin study also shows that distributing direct economic benefits effectively throughout the municipalities from HPP development in the basin necessarily need to be embedded within a legal framework (laws, concessions and licences).

At a smaller scale the A'Vuong HPP case indicate that legal frameworks on benefit sharing and establishment of institutions to cater for this can be important for successful provision of benefits to local communities and affected people. The A'Vuong HPP case is however still at a pilot stage testing benefit sharing mechanisms embedded in the new regulatory framework, so it success over time is still pending. However the Khimti 1 HPP case show that local level mechanisms (support to local level institutions and ancillary investment programs) can work even without a regulatory framework and governmental institutions in place, given that the project proponent has the interest, and will, to share its revenues, although it does not have a clear CSR policy. Having said this it is relevant to clarify that the Khimti 1 HPP owner responses were often reactive in nature and their social actions (programs) was to obtain a 'social license to operate (SLO)' within the highly sensitive political climate in Nepal, both locally and nationally.

# Stakeholder Engagement and Community Participation and Consultation

Stakeholder engagement and community participation has shown to be important for several of the case studies. Most importantly it affects however the success of ancillary investment mechanisms working at *local scale*, but also strengthening of local institutions and to some degree financial allocations to community development programs (as for the San Carlos HPP, Costa Rica). Stakeholder engagement and community participation has shown to affect the success of benefit sharing programs specifically at local level for LHWP (difference between Phase 1A and 1B for community enhancement and development programs), Khimti 1 HPP (enhancement of community level health service and institutions) and Nam Theun 2 HPP (e.g. enhancement of public health).

# Partnership Formation

Public – private partnerships (PPPs) can be important in setting the stage for bringing stakeholders together when undertaking project formulation and implementation. PPPs can also legitimize the project in that it can be seen as part of a neutral process, and work towards gaining trust of the proponent as in the case for Khimti HPP. There are a wide range of public – private partnerships (PPPs) initiated by Nam Theun 2 Power Company (NTPC) for implementation and sustaining benefit sharing programs. In the case of NT2 HPP the PPPs can be viewed as key to; (i) triggering processes related to benefit sharing; (ii) giving defined responsibilities and; (iii) implementing benefit sharing projects, as these acts as vehicles for benefit sharing mechanisms. In other words PPPs can act as enablers or precursors to benefit sharing projects (many seeded during the mitigation phase), and in many cases are key in the final formulation of benefit sharing interventions and their subsequent implementation.

# Capacity Building

In particular medium and large infrastructure projects in rural and remote areas, as is usually the case with hydropower developments, face the challenge of weak local institutions and scarce administrative and technical capabilities in the project influence area. The need for increased capacity at the local levels is therefore also a triggering force towards successful implementation of benefit sharing (as in most of the cases in this study). Increased capacity of national and transnational institutions for large projects, as has been seen in the LHWP case, will also enable for, and thus increase the possibilities of success for the implementation of benefit sharing mechanisms. Capacity building measures and supporting institutional strengthening among local, national and transnational institutions and their staff may be an efficient and cost-effective investment in human resources. In the long-run the hydropower producer will benefit from improved governance at the local/national/transnational levels through well organized and functioning institutions. Especially noteworthy here is also Nam Theun 2 HPP where capacity building of the government for managing the revenue funds has secured in-house competence as the revenue funds started flowing in.

# Best Practice and Lessons Learned from Case Studies

The best practice and lessons learned from and among the focal and extended case studies are manifold and has been grouped here as follows; (i) the importance of the mechanisms in the case studies; (ii) innovative and interesting approaches; (iii) understanding the impacts of benefit sharing; and (iv) rationale and hindrances for benefit sharing.

<u>The Importance of – the Various Mechanisms and Spatial Scale in the Case Studies</u> The importance (frequency of use) of the various benefit sharing typologies in our case studies is reflected in the table below.

Mechanisms Case Study	Project Design and Operations	Ancillary Investments	Direct Payment/ Disbursement	Institutions and Capacity Building	Policies and Regulatory Framework
Khimti 1 – Nepal	0	•	•	•	•
LHWP – Lesotho/RSA			•	$\bigcirc$	•
Angostura – Costa Rica	•	•	•		•
San Carlos – Colombia	0	•	•		•
G&L Basin – Norway	•	0	•	•	•
Nam Theun 2 – Laos	•	•	•	•	•
Bujagali – Uganda	•	•	0	0	•
HAD – Egypt	•	•	0		0
A'Vuong – Vietnam	0	•		•	•
Columbia Basin – Canada/USA	•	•	0	•	•
Control in the portfoli					

# Frequency of use of different mechanisms

Central in the portfolio Present but not central Almost or fully absent

Note that ancillary investments are the most common central set of mechanisms across the selected case studies, and that policies and regulatory framework is central or present across all studies except HAD which was developed long ago under a different political regime. The fact that this mechanism typology is being employed often may not be unusual due to the wide range of sectors it can encompass. It can also easily be a carry-over or enhancement of traditional environmental and social mitigation. In most cases in our study the latter occurred often, i.e., benefit sharing projects had their roots in suggestions made in the ESMP. This anchoring in the ESMP may also allow for easier stakeholder engagement about issues of concern. Many of the benefit sharing projects were intimately tied with local development needs and livelihoods – which is usually well executed in ESIA's.

The case studies also had benefit sharing programs/mechanisms working at various spatial scales and the importance related to this scale is summarized in the figure below.

Spatial Scale	Local community	Region	National government	Transboundary
Case Study				
Khimti 1 – Nepal	•	•	0	0
LHWP – Lesotho/RSA	•	$\bullet$	•	•
Angostura – Costa Rica	ightarrow	•	ightarrow	0
San Carlos – Colombia	ightarrow	•	ightarrow	0
G&L Basin – Norway	$\bigcirc$	•	0	0
Nam Theun 2 – Laos	•	•	•	0
Bujagali – Uganda	•	ightarrow	0	0
HAD – Egypt	•	•		0
A'Vuong – Vietnam	•	$\bigcirc$	$\bullet$	0
Columbia Basin – Canada/USA	•	•	•	0

Benefit sharing programs with its importance at various spatial scales

Pre-defined and/or central 
Present but not central
Almost or fully absent

As can be seen and expected the benefit sharing programs/mechanisms at local community and regional scale are the most frequent and central. Related to their importance at the national level, LHWP and NT2 HPP stand out. LHWP and Columbia basin are the only two transboundary cases and this is reflected in the table above.

# Innovative and Interesting Approaches

The following are the key lessons assessed to be the most important, innovative and interesting approaches that are seen amongst and across the case studies.

• Stepwise development and phased implementation allows for lessons learned to be incorporated in benefit sharing programs, e.g. especially as seen in the cases of

LHWP and G&L basin. Equally relevant is that the adaptive management has been vital for the Nam Theun 2 and Khimti HPP projects, and in the former case it has also been a key driving force. Lessons from adaptive management approaches are also found in the Angostura and San Carlos HPP's.

- Results from the various case studies indicate that sound legal frameworks and institutional arrangements become more important when implementing benefit sharing mechanisms across larger scales and more complex geopolitical settings. At smaller scales and simpler project developments, local level benefit sharing initiatives can however function without this framework/arrangements given a good dialogue between proponent/project owner and local community, and due to the fact that the proponent see that this can benefit the project in the long run. The Khimti 1 HPP case shows that local level mechanisms can work without a legal framework and institutional arrangements in place, given that the project owner has the interest and sees it as a necessity (securing community good will) for sustainable and successful development and operation of the project. Nevertheless this does not reduce the importance of the presence of regulatory systems.
- The policy and regulatory framework is an enabler (meta-mechanism) that affects especially direct payments/disbursement (e.g. royalties, taxes etc. like in the LHWP, G&L basin, Angostura HPP and San Carlos HPP cases) but also project design and operation mechanisms (e.g. operation rules of reservoirs as in the G&L case through concessions and licenses) as well as institutions and capacity building mechanisms (especially establishment of institutions enacted in laws and regulations). Ancillary investment, however, doesn't necessarily need this enabler (meta-mechanism) to be successfully implemented as has been seen in the Khimti 1 HPP case, where the nature of the proponent played an important role.
- The Vietnam legislation is innovative in its own kind, with its new decree and policy framework around benefit sharing. It has employed new approaches to stakeholder involvement, community engagement to 'test various models/modes of benefit sharing at a wide geographical scale (regional). The models include a wide range of actions including direct involvement of communities and payments for ecological services. Note that the outcome of the new approaches still needs to be studied. Finally, national legal requirements for revenue contributions to the state, although present in some cases (e.g., Nepal, Vietnam, Lao PDR), do not always define the way the funds are to be used.
- In Costa Rica the actions from the COMCURE's watershed protection programs, with investments financed by contributions from water fees and payments for ecological services have led to a decrease in the erosion and sedimentation problems in the watershed benefiting both the project owner and the local communities.
- Stakeholder engagement and community participation are especially important for implementing benefit sharing initiatives at local levels, e.g. for Ancillary Investment mechanisms. Phase 1B of the LHWP is a good example of the importance of this. In the Columbia basin, the public involvement process used to develop the 1997 Columbia Basin Management Plan resulted in very strong public support for the CBT power project investments. Community support greatly enhanced the likelihood of a successful outcome of the regulatory process that also included benefit sharing mechanisms. Furthermore, community engagement is central to the long term viability of the Vietnamese legislation, and has also been core to the success of the projects in Nepal, Lao PDR, and Colombia amongst others.

- Related to stakeholder involvement in the various phases of project planning/operation (project life cycle) there are large differences between the case studies. This is somewhat reflected by the historical setting the case studies were developed (pre 90ties, pre WCD and bank guidelines) as for HAD, LHWP Phase 1A and most of the G&L basin development where involvement in the planning has been limited. In more recent developments like the LHWP Phase 1B, Nam Theun 2 HPP and the "new" Bujagali HPP stakeholder involvement in especially ancillary investment and community development throughout the project phases has been implemented and proven successful.
- Benefits derived from integrated operation of reservoirs can be paramount for the project owners and stakeholders across sectors, as in the G&L basin, LHWP and Columbia basin cases.
- Public Private partnerships (PPP) have shown to be key for success of implementation of benefit sharing mechanisms in some cases. Examples are the NT2 and Khimti HPP's. In NT2 HPP many partnerships across a range of stakeholder groups has been established. The Khimti HPP case is also significant in this aspect as it has empowered local communities to take charge of the rural electrification project, by organizing the beneficiaries into a cooperative (KREC) an entity established and owned by the users themselves prompted by the formation of a PPP.
- ISAGEN has shown to be innovative related to their cost sharing partnerships, through their co-financing approach used to contribute and enhance benefits among neighboring communities. This approach encourages interested communities to become partners in their development initiatives instead of passive receptors. In this way the local communities feel more empowered and assume much more responsibility in the projects, increasing the chances for success.
- The Angostura HPP, San Carlos HPP and NT2 HPP cases stand paramount in the innovative approach to watershed management and ecosystem protection based on the provision of funds (fees, taxes, transfers) from financial allocations by the generation companies. In these cases it is interesting to highlight that generation companies in addition to the legally required contributions engage in complementary investments for similar purposes (e.g. biophysical interventions in their watersheds).
- Related to transparency and accountability, and promotion of this, the Bujagali HPP and Nam Theun 2 HPP has shown to have a strong grievance redress system embedded in its RAP together with an open disclosure programme.
- The Columbia Basin/CBT case study stands out when looking at a very clear linkage between projects and regional development plans as HPP development, benefit sharing initiatives (environmental protection, land conservation and education programs) is an integral part of the Colombia Basin Management Plan.
- Enabling capacity building for/within institutions can be critical for the implementation success of benefit sharing mechanisms. At local level the Khimti HPP case study through its creation of KREC is a good example. At the national level the establishment of the Benefit Sharing Council in Vietnam is another. Lastly at the transnational level the capacities of LHWC have been crucial in framing the benefit sharing mechanisms of LHWP.
- The LHWP had quite a considerable impact on the national economy of Lesotho and sparked economic development that enabled and strengthened (new) industries and services. This falls within the – Additional Economic Benefit – aspect of IHA

Sustainability Assessment Protocol and scores high in the LHWP case. Similar is the case for Nam Theun 2 HPP.

# Understanding the Impacts of Benefit Sharing

When assessing our case studies we have found that rigorous tracking of benefits and impacts is generally not undertaken, for example through socio-economic indicators such as life quality and/or human development indexes, basic needs satisfaction statistics, access to basic public services, employment, public health etc. This is partly due to the fact that the many proponents are reactive in their responses and do not have tracking regimes in place, while in new projects (like Nam Theun 2 HPP) data is still being gathered however preliminary indicating significant benefits. Future closer studies of health and livelihood statistics may reveal additional impacts of benefit sharing. In fact the NT2 environmental and social programs involve comprehensive and continuous internal and international monitoring.

Monitoring and evaluation of specific benefit sharing mechanisms, initiatives and programs are not usually explicitly contemplated to monitor the effectiveness of the social investment. Rather they are to be found as an integral part of indicators for strategies (e.g. LHWP), CSR policies (e.g. Angostura HPP) or Environmental/Social Management Plans (e.g. San Carlos HPP). An exemption is the new Nam Theun 2 HPP where it is a stand-alone activity.

Participatory, transparent and accountable processes are very important when implementing grievance mechanisms as part of (or onto) a project. Grievance mechanisms provide a way to reduce risk for projects, provide an effective avenue for expressing concerns and achieving remedies for communities, and promote mutually constructive relationships, thus it's at core for proper benefit sharing to be implemented. Successful implementation of grievance mechanisms has for example been found in the NT2 HPP, LHWP Phase 1B and Bujagali case studies.

Related to economic impacts, cost of projects and total investments in benefit sharing programs the relationship remains unclear due to historical and/or system complexity reason (e.g. HAD, G&L basin and LHWP). Moreover this issue is often sensitive to the project owner and has been difficult to disentangle with clear figures.

However in the Colombian case, a quick review of the investment figures for 2009 showed that ISAGEN investments in social and environmental plans and initiatives are distributed as follows: 80% legally-binding commitments and 20% complementary contributions. Using the same figures (from 2009) the complementary social and environmental investments constitute roughly 1 USD per MWh.

A quick assessment of the figures for LHWP indicate a total project cost of 2.6 billion EUR (Phase 1A - 1.5 billion and Phase 1B - 1.1 billion), whereas royalties for water transfer paid per year to Lesotho ranged between 45-47 million USD and investment in revenue fund for community development amounted 35 million USD in 2006.

Notwithstanding efforts undertaken, the team was unable to collect detailed information on the economic development impacts of benefit sharing. Besides the issue of sensitivity described above this may be due to the fact that benefit sharing is a reactive strategy for the project proponent to deal with stakeholder acceptance and is most often not a structured approach for combining the project with broader economic development opportunities and goals. *This is an important gap, given the potentially important role economic impacts could have in maximizing effective benefits, enrolling governments and leveraging project funds effectively*.

#### Highlights, Rationale and Constraints for Benefit Sharing

#### Highlights and Rationale for Benefit Sharing

Benefit Sharing is a promising concept and approach for implementing hydropower and water infrastructure projects sustainably, and is emerging as a supplement to the standard requirements of compensation and mitigation.

Benefit Sharing is being driven by a societal responsibility to ensure local communities improved socio economic conditions compared to those of the pre-project. Core for the mechanisms to work can be policies and regulatory framework (government), corporate social responsibility policies (project proponent), and securing communities' acceptance of the project (social license to operate). With all these elements at work tripartite partnerships are more likely to become established.

Stakeholder engagement is essential in creating and designing benefit sharing initiatives, and a regulatory framework usually facilitate the design and implementation of the initiatives.

Our study supports a typology of benefit sharing mechanisms to create a balanced approach. The typology of mechanisms proposed may help deliver benefits which are balanced over time, across stakeholders and geography, especially if a portfolio approach is adopted.

The typology confirms that benefit sharing extends well beyond monetary payments through (for example); (i) extension of environment management plans beyond compensation; (ii) innovative programs of watershed management that benefits both the communities, the environment and the project proponent, and; (iii) integrated operation of reservoirs for multiple uses.

Lastly, benefit sharing can provide equity of development, sustainability and smooth project implementation for hydropower and water infrastructure development especially through proper involvement of stakeholders.

# Constraints and Hindrances for Benefit Sharing

Benefit sharing is often reactive, lacks coordination across players, and is not well embedded in an economic development context. The consequences in these cases may lead to investments (either by governments or developers) which may not fully lead to positive results, distribution may be skewed, project proponents lack a framework for limiting expenditures, while local communities may not be able to access benefits paid to higher levels of government.

The study could not find rigorous (pre- or post-) socio-economic evaluations of existing benefit sharing initiatives. This is obviously a weakness and thus advantages could be gained by planning benefit sharing initiatives in the context of local economic development goals/program, and tracking their impacts.

Lastly improper stakeholder involvement and lack of capacity building, especially for local institutions, might be a hindrance for successful implementation of benefit sharing programs. Likewise inappropriate institutional arrangements, especially related to the tripartite partnerships, can have the same effect.

# **1. INTRODUCTION**

# 1.1 Background

After a hiatus of roughly a decade - and much debate as to its legacy and contribution to poverty and development - the World Bank has scaled up its investment in hydropower. Poverty eradication and the MDGs cannot be achieved without providing developing countries with the needed infrastructure among which hydropower is a basic component in several different parts of the developing world. Hydropower will also likely play a key role in climate adaptation as a renewable source of energy which can contribute to the reduction of GHG and to adaptation to changes from the foreseen increase in hydrological variability, e.g. help mitigate drought and floods. Furthermore, from the lessons learned of the past decade or so, hydropower is increasingly recognized as providing multiple opportunities to significantly enhance community, regional, national and transboundary development if planned, designed and implemented in a sustainable manner.

However, it is also widely recognized that for hydropower infrastructure to effectively contribute to poverty alleviation and development, the quality of projects must be enhanced and driven by imperatives of sustainable development with a strong focus on broader development goals. Historically, one of the main criticisms towards hydropower projects - in terms of social development - is that in many cases local and regional communities are often the most adversely impacted by projects whilst benefiting the least. Foreseen macrobenefits were not necessarily trickling down to the local community level and, in many cases, the populations most affected were poor rural or vulnerable groups such as indigenous peoples residing in remote natural resource rich areas.

The World Bank's has therefore renewed its vision for hydropower development, based on enhancement of the quality of economic growth and reduction of poverty, whilst safeguarding the needs of the future generations. While a relatively substantial amount of literature has addressed the importance of safeguarding project affected people, vulnerable groups and environmentally sensitive areas from unsustainable resource development, the study of (operational) frameworks and mechanisms to enhance benefits (especially non-monetary ones) and share them equitably remains scarce and fragmented. Thus it will be imperative to move from vision and literature studies into action, making the benefit sharing initiative more operational and practical.

In general for many hydropower and multipurpose dams, especially the large ones, at any given time, there may be a huge number of possible options for use of the resource that can derive benefits to wider stakeholder groups. The need to consider multiple, and often conflicting, objectives for a large number of stakeholders, and across a broad spectrum of scales, means that a huge sampler of decision variables and constraints may need to be considered along with anticipated impacts and benefits. An example of the complexity for a hydropower/multipurpose project is given in the illustration overleaf (although this example is only confined to dam operation and benefit sharing mechanisms goes well beyond this – see Chapter 3.2 and 5.2). As such, elaborating frameworks and mechanisms to ultimately enhance the benefits of such projects, will need to be addressed within a complex framework.



# Figure 1. An example of the possible complex use of large multipurpose dams with associated interlinked issues, impacts and benefits (Source: McCartney 2007).

Thus in 2008, the World Bank initiated deeper exploration of benefits-sharing in the hydropower sector. A framework for making benefits-sharing more operational was drafted, a review of literature completed and two workshops were hosted by the World Bank: a meeting of experts and a technical workshop for experts and project managers. The results of these activities were; (i) a concept note (October 2009); (ii) a literature review (May 2009) undertaken by Mott MacDonald and; (iii) the transcript of meeting of experts and technical workshop of June 2008. The World Bank extended this program, by assigning Sweco in supporting them, to explore lessons learned and best practice through the project - Benefit Sharing and Hydropower Development. This project intended to help managers in mainstreaming enhancement of social and economic development benefits into the paradigm of sustainable hydropower. Thus a methodology for assessing benefit sharing mechanisms and range of mechanisms implemented was elaborated during the inception period. This has extensively been used in 6 selected case studies and 4 additional desk review studies; whilst synthesizing lessons learned and best practice at the end. Additionally 5 concept notes on pertaining benefit sharing issues (see Chapter 3 for summaries) has been elaborated to clarify them and eventually expand on new ideas.

# 1.2 Summary of Earlier Initiatives and Literature Review

The concept of benefit sharing can be traced back to its origin in two UN resolutions some 30 years ago<sup>4</sup>. Ten years later, benefit sharing was introduced as a core concept in the objectives of the Convention on Biological Diversity (1992). Correa (2010) outlines in her paper the underlying principles derived from these initiatives that are relevant for benefit sharing in hydropower/multipurpose development. In short, somehow revised from Correa (2010), this can be underlined in three bullet-points, namely;

- Equitable and fair sharing of benefits arising from resource use<sup>5</sup>
- Appropriate sharing arrangements and access to resources by those who contribute directly and indirectly to the exploitation and use of the resource
- Priority access and special consideration on benefit sharing to those in an disadvantaged position related to the utilization of the resource

Related to hydropower and water resources development, sharing of costs and benefits more equitably was recognized by the World Commission of Dams (WCD 2000a) as one of their seven priority issues for improving decision making and the management of dams and their alternatives (Paiment 2008). Concurrently and after the WCD various other initiatives and publications has dealt with, analysed and described benefit sharing related to hydropower and water resources development (see for example Sadoff and Grey 2002 and 2005, Grey and Sadoff 2007, Phillips et al. 2006, Quadumi 2008, Teshome 2009), although a practical and operational working definition was still to be developed. A huge sampler of the above work, and other literature, is at a theoretical level. Let alone the importance of that, benefit sharing also needs to be properly anchored at a practical level for investments in hydropower and other water developments to take place under a benefit sharing framework. Thus the WB has through its renewed benefit sharing initiative, by which this project is part of, created and advanced the momentum in making the approach more operational and practical.

The literature review on benefit sharing was undertaken for the World Bank by Mott Macdonald and was issued in May 2009. The key findings from this literature review can be summarized as follows (Mott MacDonald 2009):

**Making Benefits-Sharing Operational:** While the concept of benefits-sharing is often referred to, authors have found it difficult to express what it means in reality. There is a lack of documentation and analytical work to make the concept as useful as it should be for practitioners. This has led many authors to focus more concretely on the conditions required to facilitate benefit sharing, and the mechanisms most appropriate for achieving it. More documentation on how to make benefit sharing more operational, and how it achieves positive and quality results, is needed.

<sup>&</sup>lt;sup>4</sup> The Agreement governing the activities of states on the Moon and other celestial bodies (1979) and the Convention on the Law of the Sea (1982).

<sup>&</sup>lt;sup>5</sup> Although developed without clear relations to the benefit sharing initiatives the agreed upon Regional Vision for Sustainable Development of Lake Victoria Basin ended up focusing on equitable opportunities and equitable (shared) benefits for the basin population, e.g. "A prosperous population living in a healthy and sustainably managed environment providing equitable opportunities and benefits" (Lillehammer et al. 2010). This highly participatory project was funded by NORAD, coordinated by the World Bank and undertaken by Sweco (at that time Statkraft Grøner) and associates between 2002 and 2003, and followed up in 2006 with development of a Strategic Action Program (SAP).

**Benefits-Sharing Mechanisms:** There is systematic classification and documented examples on mechanisms for transferring monetary benefits, which tend to have a more developed country focus. However, there is little systematic information on mechanisms for transferring non-monetary benefits except for community investment programs.

**Legislation:** Generally legislation on benefit sharing is regarded as an enabler or necessary precondition. There are multiple examples from both developed and developing countries where laws or policies provide frameworks and rules for the sharing of monetary benefits. In most cases, they are fairly recent and the literature describes relatively well how they work, but with scarce information on monitoring or evaluation of the benefit sharing results from a stakeholder or beneficiary point of view.

**Additionality:** Benefit sharing mobilizes additional resources above and beyond what is required for traditional compensation and mitigation budgets. In particular, large projects can produce significant economic rent that provides real opportunities for enhancing development benefits to local communities.

**Involuntary Resettlement as a Development Opportunity:** Seen through a benefit enhancement lens, resettlement can provide a development opportunity to improve the conditions of displaced persons, especially in developing countries and remote areas. A wide range of both monetary and non-monetary benefit sharing mechanisms to communities can be implemented that reach beyond mitigation and compensation to enhance incomes and livelihoods of people adversely affected.

**Monitoring and Evaluation:** While monitoring and evaluation of benefits and transfer mechanisms may be taking place at the project level to meet country or donor requirements or for corporate responsibility reporting, it is scarcely documented, dependent on management interests, and generally not systematic. It is not clear what is being monitored or how the information is being used. This renders difficult comparing efficiencies and effectiveness of benefit sharing mechanisms among hydropower investment projects. Better documented and accessible monitoring and evaluation of schemes would greatly contribute to increasing operational knowledge of benefit sharing mechanisms.

As the above indicates the literature review focuses on findings within present literature of benefit sharing with the present knowledge and loopholes therein. As such it does not present a conceptual approach to make the benefit sharing framework more operational and that will support enhancement of development benefits of hydropower and water infrastructure project. Thus the latter has been one of the major tasks for the present project, using as a template the approach described in the concept note (2009). Moreover, the present study has focused more heavily on that hydropower and water infrastructure must be developed cautiously in the context of broader development goals, e.g. (i) responsible environmental management, (ii) poverty alleviation and social development, (iii) integrated water and energy management, and (iv) institutional development<sup>6</sup>, and that benefit sharing shall be derived from the development within this wider context.

<sup>&</sup>lt;sup>6</sup> See World Bank note – Building a Sustainable Hydropower Partnership.

# 2. METHODOLOGY

# 2.1 General

The general approach follows closely that outlined in the Concept Note (2009) and in the ToR for the study (Annex 2). After an inception period identifying core issues and potential case studies (see Chapter 2.3.1 and 2.3.2) a theoretical assessment was undertaken leading up to delivery of 5 discussion notes (see Chapter 2.2.). Concurrently with this theoretical assessment selection and studies on focal cases was undertaken (see Chapter 2.3.2 and 2.4). At the end of this period also 4 additional cases in an extended desk review were included in the assessment (see Chapter 2.3.2). Following the focal and extended case studies assessment comparison and harmonization for synthesis was undertaken (see Chapter 2.5) to derive at lessons learned and best practice, which is a major outcome of this report.

# 2.2 Theoretical Assessment – Discussion Notes

To spark dialogue and discussions about theoretical approaches and issues within the Benefit Sharing framework a set of 5 discussion notes were elaborated as part of the project. Relevant issues from these notes were also included in the assessment of the focal case studies, and are also revisited in this synthesis report. Their contents are described below, and follow closely those outlined in the ToR. The two first which was delivered were note's 1) and 2) as they are more general and somewhat defines issues of the other 3. Highlights and summaries from these notes are described in Chapter 3 – Theoretical Framework. The notes constitute the following:

- Discussion Note 1 A working definition of enhancing and sharing development benefits
- Discussion Note 2 Benefits-sharing mechanisms
- Discussion Note 3 Governance Options
- Discussion Note 4 Economic Assessment of Enhancing Benefits
- Discussion Note 5 Social and Development Benefits

# 2.3 Selection and Study of Case Studies – Focal and Extended Review

# 2.3.1 Selection and Study of Focal Case Studies

Selection of focal case studies was undertaken in a sequential manner that required several steps and re-iterations also in close dialogue with the World Bank staff. Criteria's for selection were heavily based on the framework outlined in the Concept Note (2009), with some adjustments/additional inclusions (see for example Figure 4).

# Step 1: Elaboration of criteria to assess range and typology of mechanisms in potential cases

In this step we used/elaborated criteria to assess the range and typology of the benefit sharing mechanisms based on two main dimensions: a) the mechanism-scale dimension, and b) interlinkage dimension.

a) Mechanism-scale dimension

Within this dimension we made use of the proposed typology from the Concept Note (2009) with the four major categories of benefit-sharing mechanisms (Figure 2) and three levels or scales of beneficiaries (illustrated vertically in Figure 3). The two diagrams were adopted and elaborated for later selection and ranking of case studies related to their range of mechanisms and scales they had covered. For the final synthesis, we strived at covering the widest possible range of mechanisms and scales across the case studies.

Typology	Description of specific mechanisms	
Project Design and Operations	Maximize benefits of flexible infrastructure and integrated resource management. E.g., multi-purpose infrastructure (flood control, irrigation), managed flows, watershed management	
Ancillary investments	Investments outside core infrastructure to broaden reach of benefits. E.g., social infrastructure, community programs. catchment treatment	
Financial allocations	Distribute economic rents. E.g., taxes, development funds, preferential rates, joint ownership	
Institutions, Policies, & Cap.	Build enabling environment for leveraging benefits. E.g., knowledge sharing, river basin organization, SME development, development planning capacities	

Figure 2. Proposed typology of benefit sharing mechanisms of the Concept Note (2009).



Figure 3. The typology of benefit sharing mechanisms across scales of beneficiaries (Adapted from the Concept Note, 2009).

b) Interlinkage dimension

Another key aspect we strived to consider when characterizing and comparing benefit sharing programs and mechanisms was their direct or indirect relation with other development initiatives. Thus we elaborated a framework for assessing synergies and interaction with other existing or planned initiatives in order to achieve efficiency in the allocation of resources (see Figure 4). In

brief we considered three main sets of development initiatives as relevant for this assessment:

- Environmental and social management plans (ESMP)
- Corporate Social Responsibility (CSR) plans/policies
- Regional/local development plans/programs



Figure 4. Interlinkages of benefit-sharing measures across initiatives.

Figure 4 above shows the three types of plans/policies to which the benefit sharing program can be related to or have some degree of relation with. Benefit sharing mechanisms usually however, fall within the interface of two or more of these plans or policies. As it is illustrated some benefit sharing measures can complement EMPs and CSR policies; others can reinforce the interrelations between CSR policies/measures and local/regional development efforts; whereas others may complement across the whole spectrum of plans (EMPs-CSRs and Regional/Local Plans).

# Linkages with environmental and social management plans

The environmental impact assessment studies of hydropower/multipurpose projects usually provide a set of mitigation and compensation measures organized into an ESMP. These plans are meant to compensate or remediate the negative impacts of the works and activities in the construction and operation phases of the hydropower projects. It happens that in some cases enhancement measures that go beyond the strict compensation are also included in these plans or in complementary plans. A good deal of measures that can be considered as developmental benefit sharing initiatives can be found among these enhancement measures.

# Corporate Social Responsibility - CSR context

Usually, the measures considered in environmental and social management plans associated to hydropower/multipurpose projects are to be monitored by the corresponding (public or private) agencies or institutions. The measures contemplated as part of these ESMPs become mandatory for the project proponent once these plans are approved by the corresponding authorities. In addition to these (often mandatory) measures the project proponent can, and usually do, offer additional goods or services to the host communities as part of their own (voluntary) corporate policies on social responsibility or relations with the community (CSR). An important share of the initiatives that project promoters undertake as part of their CSR strategies and policies will enhance development of benefit sharing among the beneficiaries and therefore has been included as part of this study, where relevant.

#### Linkages with broader regional or local development plans - geographic scale

Although it may appear as an obvious thing to do, linking local/regional development plans or initiatives with specific infrastructure development projects (as the case of HPP's) is not usually undertaken. Linking specific measures or initiatives that may arise due to the construction and operation of the hydropower/multipurpoise scheme with existing or ongoing local/regional development plans may generate synergies to both of them enhancing their developmental impacts. Since linking benefit sharing programs with broader development plans is a key success factor for promoting and achieving local development goals, the analysis of these linkages has also been incorporated in our study. In particular, the identification of cases where they have succeeded in joining efforts from infrastructure projects with broader development plans may provide light to the design and operation of successful benefit sharing programmes.

# Step 2: Identification of potential focal case studies

Using the criteria described in Step 1 we created a long list of the most relevant projects for further ranking, in order to select the most relevant focal case studies. This long list of cases built upon some of the already suggested cases from the Concept Note (2009) together with some new.

Thus the long list for ranking constituted in the Inception Report (2010), the following;

- 1. Bujagali, HPP, Uganda
- 2. HAD, Egypt
- 3. LHWP, Lesotho/RSA
- 4. A'Vuong HPP, Vietnam
- 5. Khimti 1 HPP,Nepal
- 6. Xiaulangdi HPP, China
- 7. Penas Blancas HPP, Costa Rica
- 8. Angostura HPP, Costa Rica
- 9. Miel HPP, Colombia
- 10. San Carlos HPP,Colombia
- 11. El Encanto HPP, Costa Rica
- 12. Brasil HPP, Costa Rica

After the delivery of the Inception Report we additionally included and evaluated in the long list, through dialogue with the World Bank, the three following cases.

- Nam Theun 2 HPP, Laos
- Glomma and Laagen Basin Development, Norway
- Colombia Basin and Colombia Basin Trust, USA/Canada

We did not perceive that every potential case would meet all typologies, per se, and inter-linkages, but in selecting the best combination of the 6 focal case studies we could cover all typologies with most of the mechanisms as described in the Concept Note. It was also important that the potential cases covered selected and specific aspects that would illustrate very sound and transferable mechanisms. For ranking of especially the first 12 cases above we used the following criteria (giving scores of high, medium and low for each attribute).

- **Tripartite partnership.** If there is defined use of benefit sharing mechanisms to enhance development outcomes through a working tripartite partnership of the (i) proponent, (ii) government and (iii) communities. Do these work successfully together?
- **Community involvement**. If the benefit sharing program has involved communities directly in a participatory manner.
- **Geographical coverage.** If the benefit sharing portfolio covers a large scale: Local, catchment/watershed, basin, regional, national and/or transboundary.
- **Range of mechanisms.** If a range of benefit sharing mechanisms (large benefit sharing portfolio; see Figure 2) are used and if there are mechanisms which work together in a synergistic manner. If mechanisms employed are linked or triggered by other mechanisms/processes.
- Likely transferability of mechanisms and lessons. Given the information available on the cases is it likely that mechanisms, processes and lessons learned can be used in other locations are they transferable or is the case too unique and thus unreplicable?
- Ease of logistics for field work and obtaining information. Is it possible to efficiently conduct the field work successfully through; (i) reliable local partners; (ii) our own knowledge of the case and country; and (iii) is key information/data accessible within the time frame of this project?

# Step 3: Selection of Case Studies

For each potential candidate case study key information on the above mentioned aspects was gathered and summarized in a compact form, as illustrated in Table1 to facilitate comparison.

Cases	Tripartite partnerships	Community involvement	Geographic scale	Range of mechanisms (synergies across mechanisms)	Likelihood of transferability of mechanisms and lessons	Ease of logistics for field work and obtaining information for this study
Case 1						
Case 2						

Table 1. Example of matrix for the identification of potential cases.

From the ranking process and an extended dialogue between the Consultant and the World Bank we ended up in selecting the following Focal Case Studies for in depth assessment.

- 1. Lesotho Highlands Water Project, Lesotho/RSA
- 2. Khimti 1 HPP, Nepal
- 3. Angostura HPP, Costa Rica
- 4. San Carlos HPP, Colombia
- 5. Glomma and Laagen basin, Norway
- 6. Nam Theun 2 HPP, Laos

For each of these studies we undertook a field trip that included consultative processes including a workshop with key stakeholders, and submitted a Case Study Report (see Chapter 2.4). Results from the focal case studies are summarized in Chapter 4.1.

# 2.3.2 Selection and Study of Cases for Extended Desk Review

To support and extend the findings of the 6 focal case studies above, we also included an extended desk study review of additional international HPP/Multipurpose and river basin development projects, especially those that would add value on benefit sharing mechanisms that can be implemented in developing economies. Results from this simpler desk review are summarized in Chapter 4.2. The selected cases for the desk review were:

- 1. Bujagali HPP, Uganda
- 2. High Aswan Dam, Egypt
- 3. A'Vuong HPP, Vietnam
- 4. Columbia Basin Development and Columbia Basin Trust, Canada/USA

# 2.4 Stakeholder approach, consultative process and field work – focal case studies

The stakeholder approach, consultative process and field work were to the extent possible undertaken as similar as possible for the 6 focal case studies using a stepwise approach as described below, with variations given the different nature of each project.

# Step 1 – Identification of key aspects of the relevant projects

Step 1 constituted a direct dialogue and consultation with the project owner/proponent beforehand the field visit and at the start of it, as well as consultation with select relevant local institutions/stakeholders (the last-mentioned identified with the project owner). This was undertaken in order to identify the key aspects of benefit sharing that were relevant for each case. Concurrently and beforehand consultations and/or field visit's we collected data, information and documents on relevant benefit sharing aspects of each project. During the initial consultations we also identified, with the project owner, the relevant stakeholders to participate in the stakeholder consultation workshops (step 4.

# Step 2

# Elaboration of questionnaire and data collection tool

Besides collection of relevant documents and information as part of Step 1, a standard form questionnaire (see annex 1) was elaborated for use in the dialogue and communication with the project owner mainly, but also in interaction with select stakeholders. The questionnaire had a common structure so they could be compared amongst the case studies. The questionnaires also included key issues raised in the "Discussion Notes".

# Step 3

# Stakeholder Consultation Workshops

Stakeholder Consultation Workshops (or mini-seminar as for the case of Glomma and Laagen basin) was conducted with the participation of the relevant stakeholders (as identified in Step 1). The main objective of the consultation workshops was to fill in the gaps that had been identified in previous steps and discuss the most important case relevant issues from the questionnaire. A specific workshop agenda was elaborated for each case.

# Step 4

# **Elaboration of Draft Case Study reports**

Based mainly on secondary information and information collected during the set of interviews, conversations and workshops that took place, the Consultant elaborated a draft version of the case study reports following to the extent possible a common outline that had been agreed on during the inception, with slight variations related to the different nature of the different case studies.

# Step 5

# **Elaboration of Final Case Study reports**

The final version of the Case Study reports was delivered after internal discussion and review with the project owner, the World Bank and the consultant.

# 2.5 Comparison, Harmonization and Synthesis

To compare studies and derive at lessons learned, best practice, transferability and innovations of key benefit sharing practices from each case a harmonization matrix was developed (see Table 2). Highlights from each case study (both focal and extended desk study) are summarized in Table 7 in Chapter 4.3, which is also followed up by a thorough synthesis in Chapter 6. Additionally our work has also led to a more operational definition of benefit sharing and its mechanisms, and this is described in Chapter 5.

Case Study	Typology (mechanism)	Aspect of Typology	Beneficiary Group and social/environment component	Process followed and outcomes

Table 2. Aspects of benefit sharing typology, beneficiary groups and processes.

# **3.** THEORETICAL FRAMEWORK

# 3.1 General

As discussed in Chapter 1 benefit sharing is being conceived as a tool for increased social sustainability in development projects through distribution of benefits among a wider spectrum of stakeholders. There are several *enablers* triggering the interest and need for benefit sharing in the development of hydropower and water resources infrastructure. Some of the main *enablers* are illustrated in Figure 5. These are fundamental for the operationality of benefit sharing, and thus the implementation success of various mechanisms discussed later. As such the enablers are shortly described below (see also Chapter 5.4 where they are discussed within the concept of our case studies and comes out somewhat rearranged).



Figure 5. Benefit-sharing: Enablers and triggering forces.

# 3.1.1 Policy and Regulatory Framework

The distribution of development benefits from large infrastructure projects to local communities can take place through a wide array of mechanisms. They can be based on "voluntary" measures or initiatives from the project promoters; or they can respond to national or international regulations or guidelines. In either case, the role of the current policy and regulatory framework is a key factor affecting the outcome of the initiatives and the efficiency of the resources used for this purpose.

# 3.1.2 Stakeholders and Public Participation

The success in the design and implementation of adequate social and environmental mitigation plans associated to large infrastructure projects, such as hydropower projects, are highly dependent on the degree of dialogue and consultation with a diverse array of stakeholders. The distribution of development benefits as part of specific "benefit sharing" programs or initiatives are even more dependent on a close dialogue and interaction between project promoter and relevant stakeholders. Since very often these programs or initiatives needs to be related to, or coordinated with, broader region-wide (provincial/district-

wise) plans and programs, the need for consultation with stakeholders at a larger scale may be required. Ideally it should be anchored in tripartite partnerships: proponent-government-communities (see also Chapter 2.3).

# 3.1.3 Social Impacts and Resettlement

Social impacts and resettlement *is not an enabler as such* but more a triggering force that can spark implementation of benefit sharing programs. Probably one of the most serious concerns in the social sphere among hydropower/multipurpose projects is the direct impact on human settlements and their livelihoods. Resettlement of households and communities due to project works (reservoir creation, power house, dam site, etc) and construction activities are an important challenge for planning and development. WB's Operational Policy 4.12 on Involuntary Resettlement already encourages project promoters to conceive resettlement as a development opportunity. In many cases resettlement plans do actually go beyond the strictly mitigation or compensation of damages and include initiatives to enhance livelihoods of affected communities, thus incorporating benefit sharing. However the experience is mixed with cases where resettlement entitlements have fallen short on this aspect.

# 3.1.4 Institutional and Local Community Capacity

In particular medium and large infrastructure projects in rural and remote areas, as is usually the case with hydropower developments, face the challenge of weak local institutions and scarce administrative and technical capabilities in the project influence area. The need for increased capacity at the local levels is therefore also an enabler/triggering force towards benefit sharing. Capacity building measures and supporting institutional strengthening among local institutions and their staff may be an efficient and cost-effective investment in human resources. In the long-run the hydropower producer will benefit from improved governance at the local/national levels through well organized and functioning local/national institutions.

# 3.1.5 Integration of water management, environmental and social factors in project design

The sustainability of energy projects is strongly linked to how well integrated the project is with its natural (bio-geophysical) and human (socio-cultural) environments. The integration of such aspects should take into account the life-cycle dimension in the use and management of the renewable resources which are at the root of the hydropower potential. For that reason integrated water resources management, where bio-physical and socio-cultural aspects are jointly considered, is a fundamental aspect to consider by all parties in the hydropower sector (private investors, regulators, local communities, etc.).

Development of benefit sharing programs within such an IWRM approach is further discussed in the next Chapter (3.2 - A working definition of enhancing and sharing development benefits).
### 3.2 A Working Definition for Enhancing and Sharing Development Benefits

#### 3.2.1 General

The definition as used by Fields in the Technical Workshop paper (2009) – "A framework to maximize and distribute benefits across stakeholders, consistent with the principles of sustainability" is a good starting point in developing a practical working definition of benefit sharing. Being consistent with sustainability the typology of mechanisms (as described in the Concept note (2009) and revisited in Figures 2 and 3) should then aim for distributing social, economic and environmental benefits to the widest possible range of stakeholders at stake, in any (new) hydropower/water infrastructure development. The benefit sharing mechanisms should also work across spatial and temporal scales, e.g. from local to national and further transnational level (where relevant), and also consist of a mix of short, medium and long-term benefit portfolios. Lastly, the development of the working definition will be framed within the concept of IWRM in a basin wide context, since as Loucks (2003) put it – "The interdependence of system components and decisions strongly argues for managing them in and integrated, holistic, sustainable, manner if maximum benefits are to be obtained from them". Loucks interpretation is neatly portrayed in the schematization (Figure 6) below by Fields (2006).



From Single Output ... to Multiple Interests

#### Figure 6. Interpretation of various aspects of benefit sharing across issues and scales. Source: Daryl Fields, WB, PowerPoint presentation (Hydro 2006, Greece).

#### 3.2.2 The Relevance of Spatial and Temporal Scales

Related to spatial scales various literature focus either on benefits directed into local sustainable development (predominantly HPP/multipurpose projects) (see Mott MacDonald 2009 for a review) or benefits derived from development and management at regional/basin level (see for example Teshome 2009 for the Nile Basin). The first mentioned focuses more on enhancing the direct/indirect benefits stemming from the HPP/multipurpose development, whilst the latter focuses more on benefits derived from development and management of

shared waters and the basin (and can thus also be transboundary in nature), whereupon HPP development is but one of a sampler of aspect. Both should however be relevant when outlining a working definition of benefit sharing.

Related temporal scale the set of benefit sharing mechanisms for to hydropower/multipurpose projects to be sustainable should work on short, medium and long term time scales. It is important to note that it should be the pool of mechanisms that need to work through these various time scales, since mechanisms may have various time-spans, and some mechanisms need to be in place before others can function<sup>7</sup>. Further to this is when in the lifeline of investment projects benefit sharing opportunities should be considered and implemented.

# 3.2.3 The Relevance of Scope

Another question to pose is if scope matters? E.g. which type of benefits should be leveraged within the overall benefit sharing framework. This has been studied prominently at theoretical level, and especially at basin management scale. Two central concepts here are that of Sadoff and Grey (2002 and 2005) and that of Phillips et al. (2006). The first mentioned identifies 4 types of benefits, e.g; (i) benefits to the river; (ii) benefits from the river (iii) the reduction in costs because of the river, and; (iv) benefits beyond the river. Phillips et al. (2006) re-categories these into three types of benefits, namely; (i) security; (ii) economic; and (iii) environmental. While the Sadoff and Grey approach works well within an overall basin management and development framework, the framework of Phillips et al. would be easier to adopt and measure related to investment in hydropower/multipurpose projects, even if the latter is ideally to be part of an overall river basin management plan. The Phillips et al. approach is also closely linked to the 3 basic tenets of sustainable development assuming that security covers the social dimension, the latter scale more often used in hydropower/multipurpose development. Thus for investments in hydropower/multipurpose projects it will be more practical to introduce the dimension social instead of security benefits. Measuring social benefits can more easily be derived from EIA's, mitigation measures, local livelihood enhancement, CSR's and regional/basin plans, as it is a common terminology in these.

# 3.2.4 A Preliminary Working Definition

Embarking from the definition of Fields (2009) a preliminary working definition was suggested in discussions note 1<sup>8</sup>, namely;

"A framework to maximize and distribute benefits across stakeholders, through **relevant spatial and temporal scales** by use of **various mechanisms**, and consistent with the principles of sustainability"

Note that the terms <u>relevant</u> spatial and temporal scales and <u>various mechanisms</u> would cater for project specific alignments, thus making the working definition more operational and practical by choosing the relevant scales and mechanisms for each project at hand. Within the term spatial and temporal scales is also the linkage of the working definition to local/regional plans, river basin management, IWRM development, power pools and transboundary cooperation.

<sup>&</sup>lt;sup>7</sup> As for example the enablers as discussed in Chapter 3.1.

<sup>&</sup>lt;sup>8</sup> This has been further revised in Chapter 5.

#### 3.3 **Benefits-sharing mechanisms**

#### 3.3.1 General

Related to the types of benefits discussed in Chapter 3.2, and further embarking from Figure 2 and 3 and the Concept Note (2009), four major categories of benefit-sharing mechanisms have been categorized. These are further discussed in chapter 3.3.3 below<sup>9</sup>. The typology is further defined by geographical scale and the segment of society likely to be affected by a given mechanism along this dimension, thus a scaling of referent groups is given in Chapter 3.3.2.

#### 3.3.2 Identifying Referent Groups

Referent (beneficiary) groups can be defined at many levels: each application of the suggested typology may thus be tailored to specific circumstances and country/regional conditions. The following four can however be used as a template for more project specific alignments in specific cases:

- Local people or communities (including indigenous): Those affected by the project • components (living in the direct or indirect area of influence of the project, with particular attention to vulnerable groups).
- Regional: The interest at concern at municipal, county/province level. Very often ٠ government but also private sector, civil society and NGO's.
- National/state: The interests and concerns at the country level. Same interest sectors as at regional level.
- Transboundary: The collection of states/countries cooperating in a project, thus this level is heavily represented by government and transnational organizations.

#### 3.3.3 Referent Groups and the Major Mechanisms

Applying the referent group concept to the typology indicates the prevalence of each mechanism for each group. For example, local interests may be addressed through various mechanisms of benefits-sharing. However ancillary investments and some project design mechanisms secure more direct and tangible benefits for local communities than for example broad policies<sup>10</sup>. Conversely, policy or financial mechanisms may provide more opportunities to support a regional/national/transnational visions than ancillary investments (see also Chapter 4.3. and 5 where this topic is revisited after analyzing results from the case studies). In the following the details of the typology of mechanisms are discussed with reference to its importance at various referent group levels.

#### Project Design and Operations:

This typology focuses on project infrastructure and site issues, and by corollary, water management either through operating rules or through physical works. It captures many of the components of multi-purpose infrastructure such as complementary irrigation, water supply or navigation, flood protection and management and managed flows (for economic, livelihood and/or environmental purposes). It may be important for beneficiaries from local (e.g. operation of a single HPP project), via cascade projects in a basin, to transboundary level.

<sup>&</sup>lt;sup>9</sup> A suggested revision of these categories is given in Chapter 5.
<sup>10</sup> However decisions on ancillary investments may be triggered by policy, regulatory and financial mechanisms.

#### Ancillary Investments:

The Ancillary Investment typology captures supplementary or ancillary elements that are not integral to the main infrastructure design. It includes such items as community infrastructure and programs investments, enhancement of rural electrification and other type of service delivery, health and education programs and catchment management initiatives. It is the typology of mechanism that is most confined to local level enhancement and community development, however opportunities may arise from a series of individual projects, such as cascade projects and basin development, which can be consolidated to justify larger scale or larger geographic spread of benefits (e.g. for example trough catchment management initiatives).

#### Financial Allocations:

This typology is the most evolved mechanism within the benefits-sharing literature and has been part of various initiatives for decades<sup>11</sup>, and includes mechanisms to distribute benefits such as development funds, preferred/subsidized electricity rates, royalties, taxes, and dividends or revenue sharing to various levels of government and/or shareholders<sup>12</sup>. It may work at all referent group levels but are mostly found from regional level and above. This typology is further revisited in Chapter 5 with suggestions for redefining it.

#### Institutions, Policies and Capacity Building:

This typology captures benefits that may exist in a diffuse or geographically distant way. The regulatory framework mechanisms (policies, treaties, laws and acts e.g.) can in fact be characterized as an enabler (meta-mechanism) affecting the outcome of other mechanisms and typology of mechanisms to various degrees (see Chapter 5 for a discussion on this topic, and or suggestion to separate it as a typology of its own).

Institutional development and capacity building mechanisms can include development and/or enhancement of sectoral or apex agencies at national/transnational level, river basin management organizations and regional/local water user associations as well as development and improvements of local level institutions in for example economic or natural resource management. The last mentioned can include strengthening the ability of local contractors and labor to take advantage of new economic opportunities during both project construction and operations and through ancillary services/activities.

Capacity building also covers the strengthening of local authorities and government institutions in local and regional development planning, as well as local user groups and communities which are targeted<sup>13</sup>. This mechanism appears to lead to direct benefits which may be critical to the sustainability of the specific targeted people.

Typically national and regional level institutions have the responsibility for implementing assistance and development plans in the areas where hydropower/multipurpose projects are located. This requires coordination of activities and efforts and the alignment of programs to create synergies and complementary actions for effective benefit sharing. A main challenge is how the various institutions can function for effective design and implementation of these

<sup>&</sup>lt;sup>11</sup> For the G&L case between 50-100 years.

<sup>&</sup>lt;sup>12</sup> In some cases specific project development funds might fall into this category as well.

<sup>&</sup>lt;sup>13</sup> as shown in both NT2 HPP and Khimti HPP case studies (see 4.1.6 and 4.1.2, respectively).

programs. Thus in some instances it can be relevant to strengthen and build capacity within a sector or across sectors in a country<sup>14</sup>.

# *3.4* Governance Options

# 3.4.1 Benefit Sharing Guidelines and Policies in International Finance Institutions

Increasingly over the last decade the concept of benefit sharing has been adopted in international finance institutions through their policies, guidelines, safeguards and strategies. The issue has somehow been spearheaded by the WB whilst other institutions have followed due. Thus benefit sharing is addressed in the WB Operational Policy 4.10 – Indigenous peoples and the Operational Policy 4.12 – Involuntary resettlement, with focus on that these groups get a share from the benefits derived from the project development in an equitable manner. Benefit sharing is also explicitly considered in the World Bank Hydropower Strategy – Directions in Hydropower (2009), where the WB asks itself how it can contribute to effective, sustainable hydropower development. One of the answers is directly related to benefit sharing and reads as follows:

"Leverage regional development by exploring synergies among complementary projects and development opportunities that can benefit local communities and contribute to broader development objectives. Key mechanisms include multipurpose projects, revenue management, and benefits-sharing."

The Safeguards of the ADB were recently revised, and benefit sharing is one of the newly introduced aspects in the policy principles (ADB Safeguard Policy Statement 2009). As for the WB the ADB Safeguards on Involuntary Resettlement and Indigenous people focus on that these groups get a share of the benefits derived from project development in an equitable manner. Additionally ADB's **Resettlement Plan** and the **Indigenous Peoples Plan** contain more detailed provisions for income restoration programs of displaced population through benefit sharing.

# 3.4.2 Benefit Sharing in Transboundary Initiatives and Cooperation

The concept of benefit sharing in a transboundary setting is heavily leaned towards sharing of benefits and costs related to water management (see also Chapter 3.2). However, within this context hydropower/multipurpose projects also offers the opportunity to build transboundary cooperation through regional initiatives and institutional arrangements in both shared water resources management and development of regional power pools (like for example those planned for the Nile Basin through the Nile Regional Power Trade Project that is part of NBI). Such initiatives have benefits beyond the river, and thus the project(s) per see (see also Sadoff and Grey (2002 and 2005) and the WB – Building a Sustainable Hydropower Partnership), thus supporting both water and energy security at various spatial scales. Clearly this water and energy security is a basic tenet/commodity for enhancing social, economic and environmental benefits across various stakeholder groups.

To enable such transnational initiatives and thus *cooperation* to proliferate – clearly transboundary policies, regulatory and institutional mechanisms should play a pivotal role. A continuum of cooperative options (see Figure 7 below) can be considered from *unilateral action* (independent, non-transparent national plans), to *coordination* (communication and

<sup>&</sup>lt;sup>14</sup> See for example the Vietnam case, Chapter 4.2.3.

information sharing), to *collaboration* (adaptation of national plans for mutual benefits), to *joint action* (joint plans for management or investment).



# Figure 7. A cooperation continuum for transboundary management of water resources as portrayed by Sadoff et al. 2008.

Joint Action represents the greatest level of coordination and is normally formalized in treaties and strong institutions, where benefit sharing arrangements such as joint ownership and management of assets can form the basis. Thus the LHWP with is Treaty (1986) and the institutions LHWC, LHDA and TCTA falls under this category (see also Chapter 4.1.1 for more details). *The LHWP Treaty is unique in that it explicitly states how benefits from cooperative development will be shared* (royalties from water, electricity from HPP, other ancillary benefits e.g.). It further adopts a needs based approach whereby benefits of water resources development are shared instead of only the water itself (see also discussions in Chapter 3.2).

Finally, the shared benefits of cooperative management and development can further provide the incentives to establish and sustain transboundary institutions (Grey and Sadoff 2007), like for example OMVS in the Senegal basin and LHWC.

#### 3.4.3 Government Arrangements, National policy's, Legislation and Institutions

When the benefit-sharing framework is defined in national legislation, it often takes the form of transfers of part of the revenues from hydropower projects to municipalities or regional entities. This is, amongst others, the case in the Norwegian, Brazilian, Colombian and Vietnamese legislations (see Discussion Note 5 (2011) and Egre (2007). Development funds can also be set up to provide additional long-term compensation to project-affected populations, as illustrated by the *Chinese legislation* on post-resettlement and rehabilitation for hydropower projects. The State specifies the destination of the funds that are transferred to local or regional authorities. In Thailand EGAT has introduced a community development fund for benefit sharing with local communities (revenue sharing) for all power projects. Legislation to set up development funds is enacted also in the cases of the *Columbia Basin Trust (CBT)* in Canada and the *Lesotho Fund for Community Development (LFCD)*.

These types of government arrangements works across the various mechanisms as defined in the Concept Note (2009), and refined in Chapter 5 in this report, although it probably is most important for Financial Allocations mechanisms and investments in, or establishment of, development funds.

3.4.4 Community Participation, Institutional Arrangements and Grievance Mechanisms An operational benefit sharing framework should, through community participation, encapsulate participatory, transparent and accountable processes so that they can be implemented more successfully. The success in the design and implementation of adequate social and environmental mitigation plans, and benefit sharing programs at local level especially, associated to large infrastructure projects, are highly dependent on the degree of dialogue and consultation with a diverse array of stakeholders<sup>15</sup>. The distribution of development benefits as part of specific "benefit sharing" programs or initiatives are even more dependent on a close dialogue and interaction between project promoter and relevant stakeholders. Since very often these programs or initiatives will need to be coordinated with broader region-wide (provincial/district) or basin plans, the need for consultation with stakeholders at larger scale's may be required. Ideally it should be anchored in tripartite partnerships: proponent-government-communities. As seen in Chapter 3.1., stakeholder involvement and community participation can also act as an enabler of benefit sharing mechanisms to work.

Participatory, transparent and accountable processes mentioned above is also very important when implementing grievance mechanisms as part of (or onto) a project. Grievance mechanisms provide a way to reduce risk for projects, provide an effective avenue for expressing concerns and achieving remedies for communities, and promote mutually constructive relationships (this is also related to the risk management strategy of a company treated under Chapter 3.5.2). Important for a well-functioning grievance system is that it (CAO 2008):

- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, and lasting.
- Builds trust as an integral component of broader community relations activities
- Enables more systematic identification of emerging issues and trends, facilitating corrective actions and preemptive engagements.

Thus a well functioning grievance system, especially at long-term, has the possibility to enhance the overall benefits from the project across stakeholder groups, including the project proponent. Good practice markers for a grievance resolution system can be (derived from CAO 2008):

- Refining core company/organization values for alignment towards a grievance system
- Implement system as early as possible in the project life-cycle
- Involve community in the design
- Ensure accessibility to diverse members
- Maintain a wide scope of issues to for example address multi-party and multi-issues complaints
- Develop culturally appropriate procedures, e.g. case specific.
- Incorporate a variety of grievance resolution approaches
- Identify a central point of coordination

<sup>&</sup>lt;sup>15</sup> See NT2 HPP (Chapter 4.1.6.), Khimti 1 HPP (Chapter 4.1.2.) and LHWP (Chapter 4.1.1.) for examples.

- Maintain and publicize multiple access points
- Report back to the community
- Use of a grievance log monitor for improving the organization
- Evaluate and improve system

#### 3.5 Economic Assessment of Enhancing Benefits

#### 3.5.1 General

Based on the typology of mechanisms defined, and having a governance framework supporting benefit sharing initiatives what would be the economic rationale for enhancing local development, distributing benefits to cater for social equity and environmental performance to improve sustainability of hydropower/water infrastructure projects?

The search for *"social justice"* and *"equitable distribution"* of development opportunities appear central in benefit sharing (IEA, 2000 and WCD, 2000a). One key question that emerges then is how sharing benefits to enhance local development can be justified from the perspective of the project promoter. Is it so that enhancing local development does imply sacrificing financial performance? And if so, what is the economic rationale or the motives behind it? This can be looked at from two different angles, namely:

- Enhancing development benefits as part of a risk management strategy. Important here is the relationship between the intentions of benefit sharing to enhance local development and the efforts by hydropower companies in the sphere of social responsibility.
- Enhancing development benefits from the perspective of three groups of stakeholders: the local communities, the project promoter, and the country.

#### 3.5.2 Enhancing Benefits to Local Communities: a Risk Management Strategy

The importance of managing social risk is becoming increasingly well understood by the proponents, authorities and financiers of large projects. Social risks arise among other reasons from the dissatisfaction and grievances of external community and non-governmental stakeholders (EAP 2008). Failure to manage these issues can have enormous financial costs, significantly damage the reputation of organizations involved and even put entire investments at risk. Usually, from the perspective of ministries of finance and/or the project developers there is concern regarding the potential costs of delays in the construction phases and/or from interruption of the operations in generation facilities due to conflicts with neighboring communities. Together with these concerns there is often - either explicitly or implicitly - the question about the returns or benefits one can expect from investing in local development initiatives.

While it is universally accepted that legal permits or license is required from the relevant government agencies, project proponents are also acknowledging the importance of obtaining a *social license to operate* (SLO). The concept of SLO has been described as addressing the demands and expectations that emerge from neighborhoods, environmental groups and community members, and other elements of the surrounding civil society. Failure to properly understand these expectations can generate a diversity of risks (reputational damage, project delays or abandonment, security problems, etc.).

Table 3 shows short and long-term social risks typical of hydropower projects. For each type of social risk, the last column reports a general assessment about the potential commercial consequences. In our case it is relevant to look at the last two rows; e.g. local-level economic risks and national-level economic risks. Usually, benefit enhancing initiatives aim at reducing these sorts of risks, which as can be seen in the Table score "high" in the (last column) potential commercial consequences. It is thus another indication of the (positive) "rate of return" of social investments; i.e. these investments reduce the risks for negative commercial consequences.

	Short term		Long term		
Risk issue	Risk to construction schedule and costs	Risk to operation and maintenance	Risk to reduced access to in-country growth opportunities	Global reputation risk	Commercial consequences
<b>Local-level economic risks</b> – Unfulfilled expectations of local communities to realise employment opportunities; 'boomtown' effects; local community jealousy of migrant workers, and intra and inter- community jealousies and rivalry, with potential for violence; construction wage levels in excess of market norms (eg in agriculture) leading to 'labour drain; adverse effects of employee/sub-contractor retrenchment post construction	~	~			High
National-level economic risks – Lack of transparency and accountability in payment of revenues to central and provincial government; production revenues fail to return to region of operations in a way that provides visible economic benefits to local population; national and provincial suppliers unable to access opportunities on project owing to economic barriers to market entry			√		High

#### 3.5.3 Cost-Benefit Considerations: A Stakeholder's Perspective

Local communities in a hydropower project's influence area, either directly or indirectly affected by the project works or activities during construction or operation phases, usually face a diversity of risks. Their legitimate claim is not to become worst off as a consequence of the new project. In principle, the mitigation and compensation measures aim at this. In many circumstances, unfortunately, traditional communities do not get their user rights for natural resources recognized, and are simply excluded from the use of the resource with no or insufficient compensation (Baland and Platteau 1996). The best way to face this challenge is through improved dialogue and participation of the affected parties, so that mitigation and compensation packages are able to achieve the "no worst off" scenario. Enhancing local development opportunities through benefit sharing mechanisms may often be a cost-effective way of facilitating project implementation, as long as local communities perceive these mechanisms as contributing positively to improve their baseline conditions. Local communities can enhance their development opportunities if supported by project promoters; either alone or in collaboration with other stakeholders – public or private. The eventual improvement of local communities' baseline conditions can be expressed and monitored by

indicators such as: per capita incomes, improvement of living standards (housing, communications, and access to social infrastructure/services), measures of economic activity (agricultural/livestock productivity, market access, etc).

From the project promoters' point of view there are at least two arguments to justify profit sharing initiatives in socially beneficial projects. The first argument (regarding the time perspective) claims that actions aiming to improve social and environmental performance may have effects on profitability that differ in the short versus the long term. Higher levels of social responsibility may generate unrecoverable costs. It is thus easy to understand that enhancing local development initiatives - beyond to what is required by a legal framework entail costs for the project promoters from which some of its benefits are only visible in the long run as well as being difficult to measure. In addition, voluntary social investment may be hindered because the costs related to not having a responsible corporate behavior are often hidden or unrecognized, while the savings from cutting corners seem obvious and may be considered as apparent benefits (Testa 2008). Benefit sharing measures may induce shortterm decrease in profits which are followed by a more-than-compensatory increase in longterm profits. Under this vision, CSR/Benefit Sharing is about taking a long-term perspective to maximizing (inter-temporal) profits. This suggests that socially responsible investors should position themselves as long-term investors who monitor management and exert voice to correct short-termism (Bénabou and Tirole 2009). The second argument claims that CSR can be explained by a new class of sociological and psychological ideas that have recently entered microeconomic theory in general and the individuals' agent utility function in particular; as such CSR can be perfectly compatible with profit maximization behavior (Reinhardt et al. 2008).

For the country as a whole benefit sharing initiatives may have a positive impact on income distribution. Since nearby (rural) communities usually face higher levels of poverty on average, the benefits from enhancing development opportunities supported by monetary or non-monetary mechanisms can make a significant contribution. Local development-enhancing initiatives promoted by monetary and non-monetary mechanisms may improve equity in income distribution, increase demand for local goods and labor triggering local multiplier effects (Bhatia et al. 2003). Induced demand for goods, services, and labor from realizing existing local opportunities (through multiplier effects; income and employment linkages) will generate additional economic growth in other economic activities. This will contribute to optimal resource allocation from a country/society point of view. In addition, for the country/national society, successful benefit sharing initiatives will also lead to improved relations between the project promoter (or investors in general) and the neighboring communities (or civil society in general) as well as a lower degree of conflict. The improvement of relationships between project proponent and local communities will directly or indirectly contribute to a sound investment climate for the country.

#### 3.5.4 Multiplier Effects: Income and Labour Linkages

The review on economic assessment of benefit sharing has shown that overall gains or benefits from hydropower projects can occasionally be low among the local communities – due to weak "backward linkages" between the hydropower investment and the local economy; and thus, require positive action to exploit synergies and activate local potentials. However, multiplier effects can be triggered – increasing the economic growth potential – when local opportunities are identified and realized through benefit sharing initiatives. These

initiatives can then bring benefits to: (i) The local communities in the form of improved living conditions; (ii) the investors in the form of long-term business potential, reduced reputation risks and goodwill from their neighbors; and (iii) the country, in the form of optimized use of scarce resources (capital), improved investment climate and through stronger multiplier effects leading to increased GDP growth.

# 3.6 Social and Environmental Development Impacts

# 3.6.1 CSR's, Development Impacts, Mitigation and Benefit Sharing

Embarking from the CSR issue briefly discussed in the previous chapter the ultimate measure of success in social-environment responsibility and responsible development is based on what the organization is doing and not just saying. It is becoming obvious that community engagement is part and parcel of a successful social responsibility strategy (CSR's)<sup>16</sup>. While some developing countries are starting to include benefit sharing and social responsibility and accountability into policy regimes, there is also a significant amount of theory building up around the issue of corporate social responsibility and its sustainability. However, the issue requires a deeper understanding from a practical standpoint; (i) which mechanisms work and may be used along various spatial and temporal scales; (ii) the type of assessments required to understand stakeholders; (iii) how impact assessments may be used and; (iv) how decisions on - responsible development - interventions or measures can be reached at the various scales. Furthermore, the evaluation of good practices in public communication for decision making has to be carefully reviewed as the process adopted has implication to sustainability.

# 3.6.2 Social and Environmental Development Impacts Related to Benefit Sharing

Table 4 overleaf aims to present a summary of project related activities, with social and environmental impact development related to benefit sharing and which occur along a continuum of scales – local / project level (e.g., direct, indirect or tertiary impact zones), regional-national and transboundary scales, thus trying to give answers to items (i) – (iv) above. In doing this it may be possible to disentangle the processes and approaches necessary at different scales over time for the implementation of benefit-sharing mechanisms.

<sup>&</sup>lt;sup>16</sup> See discussion on community engagement processes and engagement in, e.g., Dhillion and Granfeld (2010), Wynberg et al. (2009).

# Table 4. Spatial scale of impacts and related time line of impacts, stakeholders groups, possible mechanisms and interventions, and proponent attributes.

Spatial (geographic) Scale of Impacts of a project	Direct Impact Zone	Indirect Impact Zone	Tertiary Impact Zone	Regional - National	Transboundary
Impact of project manifested over time (Temporal aspects)	Short-term to long-term (project live span) (ESIA/SEIA ESRA)	Short-term to long-term (ESIA/SEIA ESRA)	Long-term (ESIA/SEIA ESRA SEA)	Long-term (SEA)	Long-term (SEA)
Stakeholders concerned (referents) and potential beneficiaries (only main groups are listed, a SA should be done)	Project Affected People (PAP) (Resettlement Action Plan) (loss of natural resource base, livelihoods, property rights, etc) Indigenous Groups	Indirect affected people due to changes in natural resource and water use/service (including ecosystem services/goods) Changes in (or pressure on) Public Services and Population Indigenous Groups	Stakeholders involved in natural resource use, agriculture, local economy, etc. (including ecosystem services/goods) Potential changes in (or pressure on) Public Services and Population Indigenous groups	Stakeholders depended on water resources and ecosystem goods, and possibly regional and local economy. Government NGOs	Stakeholders depended on water resources and the intact ecosystem services Governments NGOs
Nature of Mitigation and Enhancement Measures	Compensatory Enhancement (development) (Environmental and Social Management / Action Plan)	Compensatory in some instances Enhancement CSR	Enhancement CSR	Enhancement CSR (compensatory if impacts effect livelihoods connected to river use and water services)	Enhancement CSR (compensatory if impacts effect livelihoods connected to river use and water services)
Possible Integration level		Local and district/provincial plans. Maybe regional plans	Local Plans Regional Plans	Regional plans	Transboundary Joint Action Transboundary treaties and development initiative
Proponent's Attention	Immediate and obligatory	Immediate and obligatory	May be obligatory depending on policy	Not obligatory unless policy is there	Obligatory if there is regulatory instrument or requirement by donor/FI.

ESIA / SEIA: Environmental and Social Impact Assessment / Social and Environmental Impact Assessment; ESRA: Environmental and Social Risk Assessment; Strategic Environmental Assessment; SA: Stakeholder Analysis; FI: Financial Institution

# 4. CASE STUDIES – SUMMARY OF FINDINGS

### 4.1 Focal Case Studies

4.1.1 Lesotho Highlands Water Project, Lesotho

#### Introduction

The LHWP was selected as a case study due to its transboundary nature and development and impacts at basin scale. Thus it caters for, as the G&L basin case study a large spatial scale and (transboundary) IWRM issues as discussed in discussion note 1 (summarized in Chapter 3.2). Thus focus has both been at mechanisms working on and across basin and national boundary scales, as well as those for enhancing livelihoods for the communities in the highlands.

The LHWP is a massive bi-national multi dam construction project, and one of the biggest transfer schemes in the world. It was designed, based on the LHWP treaty arrangements in 1986, to divert about 40%, or 70 m<sup>3</sup>/s of the water of the Senqu River (Lesotho) into the Vaal River Basin<sup>17</sup> in RSA. Under the terms of the LHWP Treaty the Lesotho Highlands Water Commission (LHWC)<sup>18</sup> for joint overview of the LHWP by RSA and Lesotho was established. The Lesotho Highlands Development Authority (LHDA) and Trans Caledon Tunnel Authority (TCTA) was established in Lesotho and RSA respectively to manage the implementation, operation and maintenance of the project on either side of the border. LHDA and TCTA are required to consult with LHWC on a wide range of designated implementation and financial matters.

The project and the associated dam and infrastructure development have been divided into four phases, whereupon phase 1A and 1B has been undertaken. Preparations are underway to start phase 2 (Polihali), and phases 3 (Tsoelike) and 4 (Ntoahae) are considered for the future. Major dams constructed during phase 1A and B constitute, Katse, Mohale and Muela dams as well as Matsoku weir.

<sup>&</sup>lt;sup>17</sup> Both sub-basins of the Orange

<sup>&</sup>lt;sup>18</sup> Formerly known as the Lesotho Permanent Technical Commission



Figure 8. The Lesotho Highlands project layout; proposed, designed or in operation (Source: LHDA/Conningarth Economists 2004).

#### Main Social and Environmental Impacts

The main social impact of the LHWP was related to resettlement and highlands communities affected by the development. A total of 372 households, or approximately 2,300 people were affected in the process of implementation of Phase 1A. In the case of Phase 1B, and construction of Mohale dam, a resettlement programme was implemented where communities had options to move uphill within the highland regions or opted to resettle in the foothills and/or even in the urban centers. The resettlement was effected through three stages. First stage (involuntary) was for those that would be affected by the construction of the dam and camps. Second stage (involuntary) covered those that would be affected by impoundment and the last stage (voluntary) was addressing those that were precariously located. Altogether some 390 households, or nearly 1,700 individuals, were affected.

Impacts of the LHWP on the environment are especially related to the aquatic ecology in Lesotho and alternation of flow regime and resultant impacts on floodplains and wetlands in RSA. In order to assess the long-term impact in Lesotho, the LHDA requested Metsi Consultants to perform an Instream Flow Requirements (IFR) project to predict the long term impacts of reduced river flows caused by the LHWP. This study, using the DRIFT methodology, has been claimed to be one of the most comprehensive IFR studies ever undertaken in the world, and the approach elaborated has been adopted elsewhere around the globe.



Figure 9. Mohale Dam, Lesotho Highlands Water Project (Photo: Terje Farestveit, Sweco).

#### **Mitigation Measures**

Mitigation Measures has been more comprehensive in Phase 1B than 1A. However baseline studies were carried out in Phase 1A and used to identify and provide adequate mitigation measures, and thus led to lessons learned for later phases. For Phase 1B the application of an EIA in order to assess environmental and social impact of the project was paramount. The LHDA also started to work directly with communities and non-governmental organizations (NGOs) in this Phase.

Furthermore, the WATSAN program under the Environmental Action Plan (EAP) aimed at mitigating adverse impacts resulting from the implementation of the LHWP. The program provides water supply to affected communities. It also provides ventilated pit latrines, clean potable water, solid waste, and sullage management systems. This program has exceeded its initial targets, having provided piped water systems, 2545 VIP toilets and other facilities to 126 villages throughout the Phase 1B project area which had no piped water or sanitation at appraisal.

#### Highlights of the Benefit Sharing Program

Consultations and gathering of information revealed the following to be the most important benefits derived from the LHWP:

Main benefits to Lesotho consisted of: (i) Royalty Revenues from the water transfer (M 2.9 billion between January 1998 and April 2010); (ii) Electricity generation (for national grid and export sales); (iii) Job creation (both at local and national scale); (iv) Infrastructure development; e.g, roads, bridges, power lines, housing; (v) Industries development (tourism, fisheries); (vi) Health and sanitation enhancement; and (vii) Improvement of livelihoods through set aside development funds.

The direct benefit for South Africa is the provisioning of water for industrial development and municipal/rural use in the Gauteng province. South Africa paid the full cost of the project, which is US\$ 1.5 billion. Moreover it pays an average of US\$ 45-47 million per year to

Lesotho for the delivered water. The LHWP generated job opportunities for South African workers (engineers, consultant). South Africa also benefits from the increased project-related exports to Lesotho (Matete 2006, Duc 2007). A strong institutional strengthening of the TCTA and capacity building of its professionals was also a resulting effect of the LHWP.

The main type of benefits at national/transnational scale was monetary through generation of revenues from water delivery and electricity generation whilst at local level it was non-monetary through support to local infrastructure or development (local infrastructure, health facilities, schools, water supply and sanitation, catchment management etc.) or monetary through provision of local development funds, or a combination of these. A variety of capacity building and training has been undertaken as part of the LHWP at various levels and for various organizations including LHWC, LHDA and TCTA (RSA). At local scale in Lesotho a critical mass of personnel has been trained in public health systems, clinical skills and on the job training through contractors.

#### Lessons Learned, Innovations and Transferability

So far the LHWP has been a very successful project in reaching it overarching goals, although there were some shortcomings in social and environmental issues especially during Phase 1A. There is a variety of Lessons Learned from this project, the most important being.

- The LHWP development with its regulatory framework, and associated mechanisms for sharing benefits (e.g. royalties, water transfer, electricity generation especially) has shown to be highly resilient since it has adapted to changing circumstances. The original agreement in 1986 has been subject 1 revision reflecting changing geopolitical conditions in the region and the changing relationship between the countries, but has stood the test of time.
- The difference between Phase 1A and 1B related to enhancement of benefits, especially at local level, is also related to the changing emphasis to environmental and social considerations over the last decades, e.g. guidelines, safeguards and principles derived from the World Commission of Dams, evolving Bank standards and national legislations.
- The LHWP made, during Phase 1B, extra efforts to ensure that costs and benefits emanating from the project were shared in an equitable and clear manner. This was achieved through a series of collective measures, amongst others putting in place the necessary institutions and above all providing a legal framework for enabling other benefit sharing mechanisms to work. As a result the communities impacted and affected by the project are experiencing an improved quality of life.
- A key success of the LHWP Phase 1B was the full involvement of stakeholders both at local and national level as well as within the region. There were multi level communication channels between the affected communities and the implementing agency.
- To have a clear policy and regulatory framework, stating how benefits are to be shared, e.g. as for the royalties in the LHWP Treaty, is important for the fair, timely and equitable distribution of benefits.
- The adoption of an Adaptive Management (and holistic) IFR Model and Policy principles in setting instream flow targets and requirements (through the use of the DRIFT model) in the LHWP Phase 1B project is an important lesson. Such an adaptive and holistic model (also

including requirements for livelihood) allows for adjustments to be made throughout the project lifeline for enhancement of benefits to those affected.

At least three features of the LHWP are of an innovative nature: (i) The development and establishment of an adaptive and holistic IFR model with its associated policy to mitigate impacts and enhance benefits to downstream communities. The DRIFT model developed during the LHWP is also in the forefront globally and have provided benefits to the world: (ii) A highly transparent and participatory consultation process during Phase 1B, that included also finding measures to enhance benefits to the local communities: (iii) Ensuring timely and consistent sharing of benefits (trough royalties) at trans-national scale through establishment of a strong policy, regulatory and institutional framework. The innovative features of LHWP as noted above, as well as various other lessons learned, are transferable to other projects both in Lesotho/RSA and elsewhere (as for the case of the DRIFT model the transferability is at global level).

# 4.1.2 Khimti 1 HPP, Nepal

#### Introduction

Khimti I Hydropower Project (Khimti I HPP) is a run-of-river hydropower plant on the Khimti Khola, Central Nepal with a capacity of 60 MW. The Khimti I Hydropower Project and Power Purchase Agreement (PPA) was signed on January 15, 1996 between the Government of Nepal and Himal Power Limited (HPL). Khimti I HPP began commercial operation on July 11, 2000. The Project was completed after five years of construction, and was inaugurated on November 17, 2000. The plant is operated according to a fixed monthly energy contract during the wet season from mid-May to mid-November. In the dry season any energy produced above the contract level is purchased by the state utility according to a take-and-pay agreement in the PPA.



Figure 10. Location of Khimti Hydropower Project in Nepal.

#### Main Social and Environmental Impacts and Mitigation Measures

Environmental impact studies had indicated no serious negative impacts, but recommended certain measures to mitigate the potential impacts of the Project. The main mitigation measures included compensation for lost assets, relocation of housing and school facilities, subsidizing the operation of a Project school, and community support programs (enhancement measures) such as rural electrification based on the establishment of a mini-hydro.

#### **Benefit Sharing Programme**

The Project's approach in developing benefit sharing programs included three mechanisms: monetary and non-monetary approaches, or a combination of both. The initiatives for benefit sharing were largely conceived through consultations with the prospective beneficiaries, usually prompted by concerns or needs shown by the communities. During the construction phase main consultations focused on how to provide compensations to the lost assets of the households and were primarily aimed for the directly affected households and the community. As the construction works progressed the communities began to demand support to many local development initiatives and the Project began to react upon the community demands. Consultations were held at the Project site and in the communities. Most of the community development activities/interventions benefiting beyond directly affected households and the community were conceived by the local community.

During the construction and operation phases the Khimti Environment and Community Unit (KECU) was set up to conduct community related mitigation on behalf of the project. Once the plant began its operation the mitigation activities were gradually expanded to community development activities. This meant expansion of project supported community activities initially from three Village Development Communities (VDCs), through six VDCs, and currently to 10 VDCs of Dolakha and Ramechhap districts. The evolution and expansion of community works owes much to the increased awareness among the community during the years as they began to perceive that the local community must benefit from "their" resources being utilized commercially and the gradual realization on the part of the Project that it has corporate social responsibility to the local community. The decision making process on benefit sharing activities was consultative but often as responding or reactive to those initiated by the community.

The country lacks a formal regulatory and institutional framework with respect to benefit sharing of hydropower projects. A few statements regarding royalties to the government are specified in hydropower policy and electricity acts. There is a national regulation for handing over of 10% of the royalties to the government. But the detailed operational mechanisms are yet to be developed. Whatever benefit sharing has taken place is so far project specific, and based on the initiatives from local communities, and as reactions to these demands, and/or pressure from the project management. There is no clear distinction between different measures, unless the projects are analyzed through time, space and direct project impacts. With respect to a timeline, there is a general perception that community development carried out after the project began its operation are not mitigation measures but those that can be classified as benefit sharing activities.

Perceptions differ with respect to what constitutes mitigation support and what constitutes benefit sharing. While the local community viewed that development activities supported by the project to improve the livelihood of their community as mitigations, the project

management perceived that mitigations are solely to compensate the loss and minimize the impact to the directly affected community exclusively. Accordingly mitigation measures were implemented before or during the construction phase of the Project. All community support activities developed during the project lifeline are part of benefit sharing and not necessarily mitigation, as understood by Himal Power Limited (HPL). Part of the difference in perception of mitigation support and benefit sharing revolves around the issue of what constitutes the project area, or project affected area, and what are its spatial-political boundaries. Setting aside the directly affected community, does the rest of the area within the wards of the VDC or the surrounding areas form an integral part of project affected area? The Khimti 1 HPP case shows that there is tendency among communities to keep on arguing for expanding the boundaries of the affected area. This occurs as long as the community perceives there is a possibility of obtaining benefits from the project.

#### Lessons Learned, Innovations and Transferability

The non-monetary approach was more effective in sharing benefits to the community than paying cash directly to the community or the households. Communities also appeared to prefer non-monetary mechanisms with a shared responsibility in getting the project in place.

Given that there is no formal national regulatory and institutional framework regarding the benefit sharing for hydropower projects, the Khimti 1 HPP cues towards benefit sharing anyway in the form of CSR with a project specific approach. The institutional arrangements are weak and the community development activities appear more of an expansion of compensation and rehabilitation measures than distinctly benefit sharing ones. Moreover there is lack of effective monitoring, evaluation and feedback mechanism. Similarly there is some lack of participatory initiatives from the project proponent.

At least two key innovative approaches can be identified from the experience of Khimti 1 HPP. The first one is that the project tried to bring other donors within its community development framework in, especially as a third and neutral agency. The second innovative approach was its success to expand its rural electrification by organizing the beneficiaries into a cooperative namely KREC, an entity established and owned by the users themselves.



The innovative features of Khimti 1 HPP are transferable to other projects, with tailoring to local stakeholder needs and feasibility.

# 4.1.3 Angostura HPP, Costa Rica

#### Introduction

The Angostura HPP began operation in 2002 with a capacity of 180 MW, and is the largest HPP in the country. Its construction lasted seven years (1993-2000) and had a total cost of USD \$280 million. It was built, as well as operated and administrated, by the Instituto Costarricense de Electricidad (ICE). It is located in the Reventazón River Watershed, where ICE also administrates and operates the Cachí HPP and the Macho River HPP (see Figure 11).

About 25% of the electricity consumed by the country is generated in the Reventazón River Watershed, as well as 50% of cement production and 50% of the water consumed by the larger metropolitan area. Eleven % of the country's total agricultural exports are produced in this region as well. In the year 2000, the total population was 550 000 within the watershed, and 607 896 are projected for 2015.



Figure 11. Map of the location of the Reventazón River Watershed.

#### Main Environmental and Social Impacts and Mitigation Measures

The Angostura HPP began construction before Environmental Impact Studies were required in Costa Rica. However, ICE headed the Banco Interamericano de Desarrollo's (BID) recommendations on elaborating a Management Plan for the Reventazón River Watershed as one of the requirements to finance the construction of the Angostura HPP (The elaboration of the plan was mandatory, but ICE was not required to execute it). The objective was "to formulate a management plan...that with a focus on sustainable development guarantees the decrease in river sedimentation as well as a goal to increase the useful lifetime of the hydroelectric reservoirs and (generate) subsequent benefits for the population within the watershed through an improved use of natural resources." As a result, various programs and a regulatory unit were formed. The Comisión de Ordenamiento y Manejo de la Cuenca Alta del Río Reventazón (COMCURE) was formed by the partnering of various individuals and institutions throughout the watershed and was responsible for the policies to follow within the watershed as well as the application of the actions laid out in the management plan.

# **Benefit Sharing Programme**

In this study, benefit sharing refers to the transfer of resources (monetary or not) on behalf of the HPP developers to institutions, public and private organizations, and individuals in order to carry out social, environmental and economic projects within the communities of the area of influence.

The monetary benefits are the (i)-Canon for Water Use and (ii)-Environmental Service Payments (ESP).

(i)- The Canon is a legal obligation for water users; a transfer of resources per cubic meter of water utilized for projects as an incentive for sustainable development. The ESP is an incentive that in this case is paid by the hydropower project developers in order to promote the protection of forests surrounding the watershed.

The revenues collected from the Canon are distributed in the following manner:

- 50% to in invest in conservation, maintenance and ecosystem restoration for both private areas as well as State protected wildlife areas. Investments should be made in the same watershed revenues are made. This percentage is divided in the following manner:
  - a. 25% for the Sistema Nacional de Áreas de Conservación (SINAC) in order to:
    - Promote and finance projects and actions dedicated to conservation, restoration, protection and sustainable use of water resources in watersheds, national parks and biological reserves.
    - Operation and maintenance of protected wildlife areas.
    - Payments for private lands in state protected wildlife areas such as national parks and biological reserves.
  - b. 25% for Environmental Service Payments through the Fondo de Financiamiento Forestal (FONAFIFO)
- 2. 50% to facilitate integrated water management by the Direccion de Aguas of MINAET on a national level in order to promote research, administration, monitoring, planning and control, investment in technical equipment, and projects and activities for conservation, restoration, protection and sustainable use. Some of these activities are carried out by specialized institutions with financial support from the Direccion de Aguas. Also, in the specific case of the Reventazón River Watershed, the Direccion de Aguas is authorized to transfer resources to community projects presented by COMCURE.

(ii)- Environmental Service Payments (ESP) refer to those services "that the forest and forest plantations provide, and that are directly involved in the protection and improvement of the environment." Environmental services are classified as; (i) the mitigation of greenhouse gases; (ii) the protection of biodiversity; (iii) water resources protection, and; (iv) natural scenic beauty. The law provided financing for the forest through a tax on fuel. For water resource protection, the hydropower projects that were interested in creating incentives for landowners entered into voluntary contracts with FONAFIFO. With the Canon of Water Use, financial resources were obtained in order to protect the surrounding private forests in the watersheds where hydropower was utilized for the generation of electricity, among other things.

The Angostura HPP, since ICE has initiated its payment, has been the principal contributor of funds to the Canon of Water Use and the ESP program, not only within the Reventazón River Watershed but also on a national level. The benefits the surrounding communities receive come in many forms, including the transfer of funds to the owners of forested properties and state-run, regional and local institutions for a number of projects. Other benefits include increasing forest coverage, increasing biological diversity in the surrounding forests, and guaranteeing water availability for various uses within the watershed.

Non-monetary benefits include programs, activities and resources invested by ICE in the implementation of the Reventazón River Watershed Management Plan. The plan's main objective is the reduction of sedimentation in the reservoirs. It began with 3 programs: Agroforestry and Livestock Program, Vegetative Cover and Environmental Education. In 2007, two more programs were developed: Biological Management and the Reservoir Drainage Management. Together these programs have contributed to the improvement of the watershed from an environmental point of view; but also, maybe indirectly from a socioeconomic point of view.

These benefits are neither rewards nor reparations for damages caused by the impacts of construction and operation of the hydropower project. On the contrary, in the case of the Angostura HPP, the land use practices in the upper and middle watershed and the geographic characteristics of the region have resulted in high amounts of erosion and sedimentation that work against the useful lifetime of the reservoirs. The land use and sedimentation control are not necessarily part of ICE's legal responsibilities, so any involvement with the development of the aforementioned programs is voluntary. Although ICE is legally part of COMCURE, they are not required to provide resources for COMCURE's programs.

The direct beneficiaries include agricultural producers and producers associations who through changes in land-use planning, technological innovations and sustainability in agricultural, livestock and forestry systems succeed in increasing their production efficiency, increase their incomes, decrease soil erosion, increase the vegetative cover and a decrease in contamination levels in the watershed. The implementation of the COMCURE's programs has contributed to increase the economic life of the Angostura HPP reservoir.

#### Lessons Learned, Innovations and Transferability

In regard to monetary benefits, there is little information about the results of the investments, acceptability and participation by the communities. There is a lack of initiatives that take into consideration the opinion of the beneficiaries and the communities. However, due to the magnitude of the amounts involved they are an important driver in the economic development of the watershed.

As for the non-monetary benefits, the actions from the COMCURE's programs have led to a decrease in the erosion and sedimentation problems in the watershed, as desired by ICE. But also, the beneficiaries participating in the programs and living in the communities recognize the economic and social benefits from the biophysical interventions. ICE is regarded to have a good image/reputation within the region, and is seen as a key factor for development.

The monetary benefits are transferable to other cases as long as legislation can be in place. The non-monetary benefits are transferable given that benefits both for the communities and the developer are realized. The example from the Angostura HPP has lead to the establishment of watershed management plans in other watersheds with hydropower facilities. However, there are still some challenges to overcome; it is not clear whether ICE has any defined policies or specific guidelines in order to establish watershed management plans in every watershed. The watershed management plans depend very much upon the directors of each individual hydropower project. In the case of the COMCURE it is clear that its very existence and success have been dependent upon the presence of the legal basis.

#### 4.1.4 San Carlos HPP, Colombia

#### Introduction

San Carlos Hydropower Plant is owned by ISAGEN S.A. E.S.P. and has an installed capacity of 1240 MW, with eight generation units 155 MW each. It has all the necessary infrastructure to add two additional units. Together with Jaguas HPP, Playas HPP, Guatape and Calderas HPP, San Carlos HPP is part of the Eastern Antioquia Hydroelectric Scheme. San Carlos HPP is located in the Department of Antioquia, 150 km east of Medellín city, within the territory of San Carlos Municipality, close to the El Jordán ward. The Punchiná dam is located across the Guatapé river, close to the township of Puerto Belo. It created a 3,4 sq. km. reservoir, with a storage capacity of 72 Mm<sup>3</sup>, out of which 53,2 Mm<sup>3</sup> are considered live storage. The dam is 70 m high above the river mean level, 800 m long, 6 Mm<sup>3</sup> of compacted material and the crest is at 781 m.a.s.l.



Figure 12. Location of San Carlos HPP

After 6 years of construction, the first stage of the plant became operational in 1984 and the second in 1987. With over 20 years of commercial operation, San Carlos HPP remains the largest installed HPP of the country, with 1240 MW.

#### Main Environmental and Social Impacts and Mitigation Measures

Environmental and social impact assessments were conducted prior to the construction of the plant in order to identify mitigation and compensation measures for potential impacts during construction and operation phases. Environmental and social concerns and standards by the time these studies took place, in the mid-to-late seventies were certainly not as demanding as nowadays. In spite of this, environmental management plans were designed and have been in place ever since. Most of these plans have been updated to take into account the increased awareness of the affected communities and the increased knowledge about the behavior of aquatic ecosystems, as well as social demands and concerns from the communities.

#### **Benefit Sharing Programme**

Enhancement of development benefits from hydropower projects in Colombia takes place through monetary and non-monetary mechanisms. Monetary mechanisms have been in place in Colombia since 1981 through Law 56 where among others generation plants were subject to pay (mainly land-based) taxes and fees to the municipalities on which territory the works/facilities were established. In addition to the above, in 1993 the Law 99 was approved establishing monetary transfers from the gross sales (6%) of electricity to Regional Authorities (Corporaciones de Desarrollo Regional) and to Municipalities in the area of influence of the generation units. Thus, in Colombia there is a legal/institutional framework which promotes (legally binding) enhancement of development benefits from hydropower projects.

In addition, ISAGEN does also -in accordance to the Company's mission and business model- voluntarily commit resources and efforts towards enhancement of the environmental and social conditions in the area of influence of the generation facilities. By means of non-

monetary mechanisms the company invests in environmental and social initiatives to enhance the benefits to the local communities. Voluntary environmental investments take place mainly through the following action lines; watershed conservation and restoration; conservation and sustainable use of natural resources; environmental education and disclosure of information; and GIS and remote sensing. Social investments take place mainly through the Community Development Program (PDC); the Institutional Capacity Building Support Program; the Development and Peace Program (PDP); as well as other initiatives related to Human Rights advocacy and awareness raising campaigns and activities for the company workers and their families.

#### Lessons Learned, Innovations and Transferability

There are at least three aspects from this Case Study which are worth considering, both for their innovation as well as for the potential for transferability. These aspects relate to; (i) the existing legal framework for monetary mechanisms; (ii) social investment in governance – civil/human rights initiatives; and (iii) the use of the co-financing approach in order to encourage co-participation from other institutions and ownership and empowerment among the beneficiaries.

The existing legal framework in Colombia provides the basis for financing local development initiatives from contributions by the hydropower companies. In particular, Law 56 from 1981 and Law 99 from 1993 established a framework, including taxes, fees and transfers from the generation companies to local and regional administrations. These monetary contributions provide the financial resources for enhancing local development in the areas of influence of hydropower generation facilities. There is however, still need for improving the efficiency in the use of these resources and provide a more dynamic administrative framework for the application of these funds.

ISAGEN has been very active promoting awareness and defense of human rights in their projects influence areas. This is probably not a very common field of intervention for standard hydropower companies. However, given the specific circumstances faced by civil society in Colombia in general and in the project influence areas in particular, ISAGEN has considered this to be also a relevant aspect to devote resources and efforts as part of their voluntary contributions to local development.

The co-financing approach used by ISAGEN to contribute and enhance benefits among neighboring communities has shown to be appropriate. This approach encourages interested communities to become partners in their development initiatives instead of passive receptors. In this way the local communities feel more empowered and assume much more responsibility in the projects, increasing the chances for success.

#### 4.1.5 Glomma & Laagen Basin, Norway

#### Introduction

The G&L basin covers an area of approximately 42 000 km<sup>2</sup> from Røros in the Northeast, Grotli in the Northwest and down to Fredrikstad in the south (Figure 13), encompassing a total length of 600 km (with 1 % of the basin residing in Sweden).

The hydropower development in the G&L basin reflects a history of more than 100 years. The main construction period in the basin was from 1945 to 1970. Most regulation dams and power stations in the G&L basin were built more than 30 years ago in a context quite different from the present situation in the G&L basin.

Today the G&L basin encompasses 40 regulation reservoirs with a total capacity of approximately 3500 million m<sup>3</sup> of storage, equivalent to 16% of the basin runoff. Generally the hydropower reservoirs are natural lakes with water level fluctuation of 2-12 meters after regulation. Lake regulation capacities result from a combination of heightening and lowering natural water levels. The increase in total basin lake area is approximately 46.6 km<sup>2</sup>. The highest dam in the basin is 40.8 meters and many of the lower dams qualify for the ICOLD definition of large dams due to the size of the reservoir they regulate. The largest power station in the basin has an installed capacity of 300 MW. The total installed capacity in the basin is 2 165 MW, with an average capacity of 42 MW for the 51 power stations. The management and operation of the dams, reservoirs and power stations is integral and done as a basin entity by the Glomma and Lågen's Water Management Association (GLB) that also serve as a stakeholder association related to basin management.

The main usage of the structures in the basin is the following:

- Production of hydroelectric power for the national and provincial power grid. Today the G&L basin hydropower plants supply approximately 10 TWh annually, or about 9% of Norway's national electricity supply.
- The reservoirs are also used for flood management and do for example reduces the flood peaks at extreme floods. Historically the G&L basin has experienced several major floods, eight of them in the last century, whereupon the last one in 1995 was the most severe.
- The river basin also provide water to some extent, during growth season in summer, for agricultural irrigation
- Several municipalities in the G&L basin abstract water from G&L for municipal and industrial water supply. Some 55 000 people use the Lake Mjøsa (Norway biggest freshwater lake) as their source of drinking water and 217 000 are connected to municipal drinking water plants with water from the river Glomma (the main sub-basin of G&L basin).
- Related to recreation and tourism the basin contains attractive trekking routes in mountainous and forested areas, as well as white water and rafting hotspots such as Sjoa river. Tourism and natural heritage protection has increasingly become more important for basin management and operation over the years.



Figure 13. The Glomma and Laagen River Basin (Source: WCD 2000b).

#### Main Social and Environmental Impacts

The step-by-step hydropower development took place during a period of more than 100 years. All but one reservoir are modified natural lakes. The water level fluctuations in most of these are small. Reservoirs with great water level amplitudes are located in remote mountainous areas. The conflicts during the licensing process and the construction phase have been very moderate. Projects with strong opposition have not been developed. However, there are divergent views on this issue among stakeholders, but there is general agreement that the current impacts have not caused major conflicts. All the G&L basin hydropower development projects have been predicted to result in no resettlement of people. Although the system of dams and reservoirs in the two major sub – basins are very extensive, the total inundated land from reservoirs in the G&L basin encompasses only 45,8 km<sup>2</sup>. This is an increase of 5,6 % compared to the natural area of all the reservoirs before regulation. In addition most of the areas inundated are high altitude forest and mountain areas. As a consequence resettlement of towns or single households from hydropower activities have not occurred. Thus effects on indigenous people and ethnic minorities have not been relevant issues (WCD 2000b).

As most of the hydropower licenses and dam construction took place in an era where there was little focus on environment and impact from human development (pre 1970's which was before EIA's were required), there are few investigations on the impact on environment from this period. Negative effect on fish harvesting was the only predicted impact at the time of dam construction. After construction the effects of hydropower on fish, fisheries, aquatic and terrestrial biology has been investigated on a regular basis. Few of these investigations were however designed as EIA's, but merely as pre-regulation registration and monitoring (WCD 2000b, Haugum 1998). As in most other regulated river basins in Norway, the impact on fish have been of particular interest due its importance for recreational and to some extent subsistence fishery.

#### **Mitigation Measures**

Since the first regulations, compensations have been paid to the fishery right owners for damages on the fishery. The size of the compensations is established by legal appraisals. Fish stocking as a mitigation measure has also been implemented from the dawn of the HPP development in the basin. Since the social impacts have been minor, focus in the G&L basin case has been on mitigating environmental impacts. Besides fish stocking mentioned above, these constitute:

- Habitat improvements:
- Construction of fish ladders:
- Minimum discharges and ecological flow:

#### **Benefit Sharing Programme**

Benefit sharing mechanisms and initiatives following from them, are not special for G&L basin solely, but are vested in the Norwegian regulatory framework relevant for development and operation of the country's watercourses and river basins as such. Central is the Industrial Concession Act No. 16 (1917), the Watercourse Regulation Act (1917), the Energy Act (1991) and the Water Resources Act (2000). The Norwegian legislation comprises a number of mechanisms that ensures monetary benefit sharing from water management and hydropower projects to regional and local communities. These mechanisms fall under three categories, and are as follows (Egre 2007):

- Provisions included in licenses pursuant to the Watercourse Regulation Act (2000).
- Taxes paid to regional and local authorities.
- Revenues received by counties and municipalities in the form of dividends to the owners.

As mentioned earlier, the benefit sharing programs of G&L basin has a history ranging almost hundred years, with mechanisms vested in the national legislation and regulatory framework. Benefits shared and harnessed from the development vary from local (municipal) via regional (county) to national scale. The main mechanisms worth highlighting covers; integrated operation of basin reservoirs; involvement of local communities in environmental programs related to mitigation and enhancement of benefits; taxes – license fees – business development funds; and finally a policy and regulatory system - providing a strong framework for distributing benefits across and within the basin, as well as for each HPP development. A summary and overview of the main aspects are given in Table 5 below.

# Table 5. Summary and overview of main aspects of benefit sharing mechanisms for the G&L basin.

Typology (mechanism)	Aspect of typology	Beneficiary Group and social/environme nt component	Process followed and outcomes	Links to Mitigation Measures and EMP
Project Design and Operations	Integrated operation of basin reservoirs.	HPP producers, project owners and stakeholders at large (e.g. related to flood management).	Part of the mission of the G&L Water Association. Operation rules also vested in the concession system. The integrated management has shown to be of large economic value.	Operation of reservoirs vested in the licenses and concession system.
Ancillary investments	Investment in local and regional environmental programs, including capacity building in these.	Local, Municipal and County levels.	Collaboration with local interest organizations and stakeholders. Local capacity building. Local ownership.	Environmental monitoring, mitigation and enhancement is vested in the licenses and concession system.
Financial Allocations <sup>19</sup>	Taxes, license fees, business development funds.	Municipal and County level Local land owners	Part of the license and concession system. Increased involvement and ownership by municipalities/com munities. Local acceptance.	None
Institutions and Policies and Capacity Building <sup>20</sup>	A mature regulatory system for distribution of monetary benefits.	Municipality, County, Basin and State level.	Part of the license and concession system.	None

Today the operation and management of the basin involves several governmental institutions (5 counties, 5 county governors and 60 municipalities in addition to the national ministries and directorates) with jurisdiction of different acts, different types of planning processes and monitoring, forecasting, and research activities. Operation and management also include the participation of nongovernmental organizations (NGOs) and management of the different water user interests by professional associations.

Benefit sharing approach or mechanism consisted of three types: monetary, non-monetary and combination of monetary and non-monetary. The main type of benefits has been monetary through generation of revenues (taxes, license fees, sales, owner incomes, local business development funds e.g) from electricity generation whilst non-monetary came largely from flood control of reservoirs and flood protection measures and through

<sup>&</sup>lt;sup>19</sup> For G&L these mechanisms would go under direct payment/disbursement in our revised typology of mechanisms in Chapter 5.

 <sup>&</sup>lt;sup>20</sup> For G&L these mechanisms would go under policies and regulatory framework in our revised typology of mechanisms in Chapter 5.

development of local and ancillary infrastructure. During the consultations with GLB at Lillehammer Tuesday January 25<sup>th</sup>, both monetary and non-monetary were stated as desirable mechanisms for successful sharing of benefits, although monetary mechanisms were conceived as more paramount.

A variety of capacity building and training has been undertaken throughout the history of the G&L basin development at various levels. Besides the obvious capacity building of staff in GLB the development has had a positive impact on the organizations of the hydropower sector in the area. At local scale representatives from interest organizations have been trained in monitoring and mitigation activities especially related to fisheries.

#### Lessons Learned, Innovations and Transferability

With its almost 100 years of history of stepwise hydropower and dam's development in the G&L basin this case has been a very successful in sharing benefits at large from local, regional and up to national level, especially related to monetary mechanisms. There is a variety of Lessons Learned from this project.

- The step by step development of hydropower and dams in the basin has reduced the conflicts to other user interests and sectors and maximized the benefits across user groups.
- A sound and mature regulatory system embedded within the various laws, acts and their associated planning, concession and licensing processes has ensured that benefits from hydropower and dams development has been spread equitable across and amongst local, regional and national scales. As such, this case demonstrates that to have a clear regulatory framework, stating how benefits are to be shared is important for the fair, timely and equitable distribution of benefits across the basin.
- Derived from the above framework regional and local distribution of benefits from hydropower development in Norway is ensured by compensation, taxes, license fees, sale of licensed energy and owner incomes.
- The same regulatory system has ensured participation and transparency throughout various development processes securing that needs and views from a large range of stakeholders has been included. The involvement have consistently increased over time securing more equitable benefits, however by increasing the involvement the process has become more time consuming, resource intensive and costly.
- Managing basin operation in an integrated fashion as undertaken by GLB ensures sustainable use of the water resources (including flood management), optimal water usage to the users, and thus helps GLB guarantee the reliability of supply to the hydropower industry in the basin. *The value of having this ability to regulate the water in the basin at an integrated level is estimated close to 0.7 billion NOK (GLB 2009).*
- Benefits from integrated management of a huge sampler of dams that include flood operation procedures, has high flood prevention effect thus benefiting the society at large against floods.
- The integrated management, forecasting and modelling at basin scale caters for Adaptive Management that benefits prime water users (in the G&L basin the hydropower industry) and other stakeholders/interest groups. Such an adaptive and integrated management allows for adjustments to be made for enhancement of benefits to various user groups under different conditions.

Having a clear-cut, participatory and transparent policy, regulatory and institutional system in hydropower development and operation that have evolved over many decades as in the case for Norway and the G&L basin can barely any longer be seen as innovative any longer but can be used as a model of departure in other country's when developing mechanisms for equitable sharing of benefits from hydropower development. Although local adaption always will be needed there is a high degree of transferability related to this system, also because it has worked successfully for a long period of time.

The most innovative approach related to the G&L basin case study is GLB's integrated management and forecasting/modeling for water usage and hydropower production to optimize the benefit from this at basin scale, whilst minimizing the effect on the environment. As such lessons from this integrated operation can also be transferred to other cascade and basin developments around the world, where the objective is to maximize benefits at basin/regional level.

# 4.1.6 Nam Theun 2 HPP, Laos

The Nam Theun 2 HPP (NT2 HPP), is an industrial and development investment owned by private shareholders, by which are; Electricité de France (EDF), Electricity Generating Public Company Limited (EGCO), and the Government of Lao PDR, which is represented by the Lao Holding State Enterprise (LHSE). The project is backed by commercial lenders and international financial institutions, including the World Bank and the Asian Development Bank. The project is designed as a build-own-operate-transfer (BOOT) project. The Nam Theun 2 Power Company (NTPC), created in 2002, is the company formed by the Lao Government and the private shareholders in the Nam Theun 2 Multi-Purpose Project to build and then operate the Project for the first 25 years. Prior to this, back in 1993, Government of Lao PDR (GoL) and NTEC (Nam Theun 2 Electric Company) signed a Project development agreement in accordance with World Bank guidelines. Thus an exclusive mandate was granted for the development of NT2 HPP as a private sector investment project (the GoL holding a 25% equity share), primarily for the export of power to Thailand. An elaborate and very detailed Concession Agreement (CA) was signed in 2002, while the Power Purchase Agreements with both Electricity Generating Authority of Thailand (EGAT) and Electricité du Lao (EDL) was signed in November 2003. The construction was started on site in 2005. It was completed in December 2009 as was planned and started operation in 2010.

NT2 HPP is a trans-basin diversion project affecting two rivers – water from the Nam Theun is dammed on the Nakai plateau with a small flow into Nam Theun downstream and the rest is released into the Xe Bang Fai river - via a regulating pond, regulating dam and a 27 km channel - after power generation. The basin has a catchment of 4,039 Km<sup>2</sup>. Located in the central part of Lao PDR, NT2 Hydropower Project has a geographic footprint that touches mainly Khammouane province, downstream from the dam site to Bolikhamxay Province (Nam Theun river) and with some project works in downstream areas in Savannakhet province (including Xe Bang Fai River). It is about 430 kilometers from Vientiane by road. It stretches from the Nakai Plateau to the lower Xe Bang Fai River confluence with the Mekong – thus spread over a large territory (ca. 200 km by 50 km).

The Project harnesses the industrial potential of the dammed water (reservoir) on the Nakai Plateau in Khammouane Province, and the about 350 m height difference between the Nakai Plateau and the Gnommalath Plain (Savannakhet province) below. The power of this water, channeled down a tunnel drilled through the karst mountain, can generate an average 6,000 GWh of electricity per year. Besides the 1,000 MW of electricity sold to Thailand, NT2 also supplies around 80 MW of electricity for domestic use in Lao PDR. The project is projected to provide the Lao PDR government an average of US\$80 million per year over the first 25 years of the Project's operation.

#### Main Environmental and Social Impacts and Mitigation Measures

Studies by many parties - including project shareholders, the Government, domestic and international NGOs, independent consultants and multilateral development institutions - predicted significant environmental, social, and economical impacts. The key impacts of the project operation on the physical environment were associated with changes to hydrology, water quality, erosion rates and to a lesser extent climate and groundwater. There were also predicted impacts on the biological environment, specifically on aquatic and terrestrial habitats, species diversity, protected areas and endangered species.

The key social impact of the project was the relocation of approximately 6,300 persons from 1,270 households in 17 villages. The establishment of the resettlement area on approximately 210 km<sup>2</sup> on the southwest side of the reservoir and the livelihood activities of the resettled people was also predicted to potentially impact on existing land and natural resources, including loss and disturbance of natural habitats, erosion and degradation of soil, overexploitation of wildlife and aquatic resources and human wildlife interactions, and deterioration of water quality resulting from fertilizer use and poor wastewater disposal. In addition impacts could be expected from the increase in population attracted by new infrastructure and economic opportunities, and the necessary shift from subsistence livelihoods to a market economy.

However, the adverse impacts have been reduced to the extent possible through project design and extensive participation of project affected people in the development. This has been done through extensive resettlement and compensation plans and their extent will be further managed and mitigated through implementation of the EMP (Ethnic Minority Development Plan), SDP (Social Development Plan) and SEMFOP (Social and Environment Management Framework and 1<sup>st</sup> Operational Plan) and other related programs<sup>21</sup>. In fact, the project has been designed to meet and it often exceeds the applicable World Bank guidelines on environmental and social issues. There are three key project areas where mitigation activities have taken place in the watershed, namely the Nakai-Nam Theun National Biodiversity Conservation Area (NNT NBCA), the Nakai Plateau, and the downstream areas.

Unanticipated impacts have also occurred, with backwater effects in both the reservoir and the Xe Bang Fai, extending far further than was envisaged. Along the Nam Xot, which feeds into the reservoir, backwater effects has lead to that NTPC has begun livelihood improvement activities in the Ban Na Hao area. Along the Xe Bang Fai upstream of its confluence with the downstream channel, several villagers have been added to the NTPC

<sup>&</sup>lt;sup>21</sup> ADB 2004, "Summary environmental and social impact assessment of Nam Theun 2 Hydroelectric Project" (November 2004)

Downstream Program.

#### **Benefit Sharing Program and Lessons Learned**

There are a myriad of lessons to learn from a multipurpose project like the NT2 HPP, due to its magnitude, geographic location and footprint, social-cultural makeup, natural environment status, and capacity needs. The presentation here is limited to those consepts, typologies and mechanisms relevant in our study.

As it is not always an easy task to separate mitigation from benefit sharing our investigation included a close study of the mitigation to tease apart what would be obligatory and within the expected, or rather practiced, realm of mitigation. This close scrutiny resulted in identification of key benefit sharing mechanisms which could easily fall under the definition of benefit sharing namely due to their; quality, extent (geographical), temporal perspective, and beneficiaries. The flow chart below illustrates the benefit sharing typologies<sup>22</sup>. Key for these typologies to fall into place was; (i) A strong participatory nature and the formation of private-public partnerships which function as vehicles/enablers for the mechanisms to take form and be implemented; and (ii) an early vision of these interventions anchored in ESIA recommendations, continuing through the mitigation process and beyond; and (iii) adaptive measures central to the current success and community acceptability.



# Figure 14. Flow chart showing measures which go beyond their expected obligatory limits in quality and time.

In the NT2 HPP, teasing apart the obligatory mitigation from that which could fall within the realm of benefit sharing has not been easy. However when the interventions are seen in light

<sup>&</sup>lt;sup>22</sup> Measures presented here are those which were studied in this project and were judged as contributing significantly to the intended beneficiaries and which could easily fall under the category of benefit sharing , and do not exclude other existing measures which may also fall within the benefit sharing framework.

of real practices of mitigation, based on international requirements, there are clear components which go beyond the obligations. The benefit sharing typologies and mechanisms investigated in this study also point to; (i) the need to anchor interventions in needs and impacts, that surface from the assessments, and are put forth in the management plans; and (ii) the need for continuity in the follow-up and development of the interventions.

Basic human needs, like health services, can be key interventions where the beneficiaries can include communities beyond project area boundaries. Ensuring tenure security and exclusive rights to resources can be vital to jump-start the livelihood restoration of resettlers. Again here the discussion of how one distinguishes mitigation levels from when benefit sharing kicks in is difficult. What is clear here is that it is not often project proponents help provide the above rights to communities. Several factors may determine the feasibility of creating such rights, e.g., government willingness, prior agreements (like the Concession Agreement in this case), community *rights* organizations, national and international policy, etc. *From the perspective of communities some clarity between mitigation and benefit sharing 'boundaries' may be useful to have for the proponent to keep expectations realistic, and allow for focus on improving interventions (e.g., allocating funds and building sustainability) already in place.* 

There are a wide range of public – private partnerships (PPPs) initiated by NTPC for implementation and sustaining benefit sharing programs. In the case of NTPC the PPPs can be viewed as key to; (i) triggering/enabling processes related to benefit sharing; (ii) giving defined responsibilities; and (iii) securing implementation of benefit sharing projects. In other words PPPs can act as precursors/enablers for benefit sharing projects (many seeded during the mitigation phase), and in many cases are key in the final formulation of benefit sharing interventions and their subsequent implementation.

In many countries proponents often ignore the watershed management issues due to their magnitude and costs, diffuse responsibility and/or simply lack of knowhow. In the NT2 HPP there is clear contribution from the project revenues that will be used to protect the watershed and more uniquely enhance development/livelihoods of local communities living in remote watershed areas. This is done through the development of partnerships and the establishment of a regional institution – the Watershed Management and Protection Authority (WMPA). What was central to this revenue contribution was a vision to do this early in the project cycle in close dialog with GoL.

Central to all interventions is the need to start building capacity at all levels, even the sector agencies, so that there is ample trained capacity to anchor the interventions towards sustainability. The use of large amounts of revenue funds or taxes is not usually done easily due to the poor, or lack of a functional, management system. In addition there can be a lack of focus on priorities based on participatory methods and transparency. The NT2 HPP showed that revenue management system can be set-up with the intention of securing proper management of funds.

The use of experts (the right discipline) for training and evaluating is also seen as necessary. Participatory processes are again important in allowing for views to be considered and priorities to be made. Local institution formation for resource management that also "feeds" into higher level institutions (district/regional/national) are important. Many of the programs

also had pilot phases which can be important to monitor, and adapt if needed. The instilling of transparent communication and reporting systems also contribute to good will for the project and generate interest from a range of interested parties, including international ones.

### **Innovations and Transferability**

Key to the typologies falling into place includes several elements centered around strong participatory processes and the formation of private-public partnerships which triggered the development and implementation of measures. An early vision of these interventions anchored in ESIA recommendations, continuity through the mitigation implementation period and beyond, and adaptive management were central to the current success and community acceptability. There are many elements to learn from in this project however the above mentioned aspects are central and can easily be transferred into the development of new HPP's from the start. Some seeds for a viable benefit sharing program based on the NT2 HPP experience include:

- Interventions Anchored in ESIA findings
- Strong Participatory Components Essential
- Establishment of Partnerships is key
- Continuity in programs/measures
- Sharing of revenues with the Government
- Inclusion in Concessional Agreement
- Follow-up, monitor, analyze and adaptation

In a broad sense it is valuable to be able to separate obligatory from benefit sharing interventions, especially as it gives dimensions of understanding and appreciation among communities (beneficiaries). For private developers this may be highly relevant to keep expectations realistic over the project cycle.

# 4.2 Findings from Extended Global Cases

#### 4.2.1 Bujagali HPP, Uganda

#### Introduction

The Bujagali Hydropower Project (Bujagali HPP) is a 250-megawatt power-generating facility being built on the Victoria Nile River near the Town of Jinja, in Uganda, by Bujagali Energy Limited. It is sponsored by Industrial Promotion Services (Kenya) Limited and SG Bujagali Holdings Ltd, an affiliate of Sithe Global Power, LLC (USA). An associated power transmission system, the Bujagali Interconnection Project, is a separate but associated project sponsored by Uganda Electricity Transmission Company Limited (UETCL) that will distribute the hydro electricity to the Ugandan power grid. The hydropower project will produce substantial benefits for Uganda and for citizens living in the area of the facility (www.bujagali-energy.com).

The dam will impound an area that extends upstream to the tailrace area of the Nalubaale and Kiira facilities (previously Owen Falls), inundating Bujagali Falls. The reservoir will have a surface area of 388 ha, comprised of the existing 308 ha surface of the Victoria Nile, and 80 ha of newly inundated land. The amount of newly inundated land is small, as the reservoir waters will be contained within the steeply incised banks of river. In total the project will require a land-take of 125 ha for newly inundated land and permanent facilities. An additional 113 ha of land is needed temporarily for the construction of the facility.

Development of the Bujagali HPP was initiated by AES Nile Power Ltd., (AESNP) in the late 1990's. AESNP prepared the Social and Environmental Assessment (SEA) documentation. In 2003 AESNP withdrew, leading the GoU to initiate an international bidding process for the project. In 2005 BEL was selected as the preferred bidder and entered into a power purchase agreement and an implementation agreement with the GoU (Burnside et al. 2006). The construction started in 2007, and will be finished in 2011.



### Figure 15. Construction of Bujagali HPP (Source: Bujagali Newsletter, Quarter 1 2010).

#### Main Environmental and Social Impacts and Mitigations

According to Burnside et al. (2006) land required for the construction and operation of the hydropower facility totals 238 ha. Landowners were either resettled or provided cash compensation for loss of land by the previous project sponsor. Eighty-five households were displaced. Immediate corrective activities being undertaken by BEL include: provision of new water supply hand pumps at 17 existing borehole locations in the surrounding communities; improvements to education facilities in the 8 affected communities; and, improvements to the health facilities at the Naminya resettlement site.

Furthermore, the project will result in inundation of Bujagali Falls and associated rapids. Burnside et al. (2006) reports that the operators are generally well-advanced in their preparations to re-orient their operations downstream, and expand it beyond rafting. To facilitate the move, BEL will provide new raft launching facilities downstream of the dam, the specific locations to be agreed upon with the operators. BEL has also been involved in consultations with the WWR (White Water Rafting) operators as to how it can further offset the impacts on their activities, and support the relocation process.

The Burnside et al. SEIA (2006) did not anticipate the project to have any significant long term effects on water quality or aquatic life although some erosion might occur during initial operation and fish stocks will naturally increase in the reservoir compared to "natural" conditions. Related to terrestrial environment the Bujagali HPP will result in disturbance and loss of land that falls within the Jinja Wildlife Sanctuary. According to the Burnside et al. SEIA
(2006) consultations with the management authority for the Sanctuary indicate that planned enhancement planting will offset the losses.

At cumulative impact level, that includes the assessment of Bujagali together with Nalubaale (Owen Falls), Kiira (Owen Falls Extension) and Karuma, some issues of impacts have been highlighted, although not anticipated to be the most significant. These includes amongst others:

- Disruption of natural flow regime over an + 8km stretch of the river Nile, with associated impacts on;
  - Aquatic organisms and communities
  - o River users
- Loss of wildlife populations due to habitat fragmentation and loss of ecosystem connectivity
- Disruption on fish migrations

# Sharing of benefits from the project

To be finished in 2011, it is anticipated that the Bujagali HPP will generate a number of economic and developmental benefits at both the macro-economic and local levels, and it is also expected to make a major contribution towards the GoU goal of poverty eradication. The key macro-economic benefits expected include (Burnside et al. 2006):

- Reduced electricity rationing and the associated costs of alternative self generation;
- Creation of conditions to attract direct foreign investment to Uganda;
- Increase in productivity and lower costs for government, education, health, business and industry;
- Facilitation of rural electrification; and,
- Decrease cost of electricity for consumers.

Related to local economic benefits from the project, for the wider community over and above the benefits accruing from alternative income generating activities, this includes (Burnside et al. 2006):

- Direct employment of Ugandans during construction (600 to 1,100 persons) and operation (50 persons) of the project;
- Induced employment (an estimated 9,000 to 16,500 jobs during construction and 250 during operations) and increased trade in service industries, particularly during the dam construction period; and,
- Benefits from indirect employment and trade, in industries and commercial activities, which become established as a result of the greater availability of electricity.

Besides the economic benefits described above BEL has institutionalized a benefit sharing program by developing a Community Development Action Plan (CDAP) which sets out proposed actions that will benefit the wider communities in the project area, beyond those individuals and households who have been or will be directly affected, such as by loss of land, crops or other assets. The area that will benefit from the CDAP consists mainly of the eight directly affected villages: four on the West Bank (Mukono District): Naminya, Buloba,

Malindi, Kikubamutwe; and, on four the East Bank (Jinja District): Bujagali, Ivunamba, Kyabirwa and Namizi.

BEL proposes to support long-term sustainable development initiatives, rather than to generate them. Thus the CDAP was developed, based on the following strategy:

- Construction of the hydropower facility will provide direct sources of employment to directly-affected persons;
- Local communities should benefit from indirect employment opportunities;
- Water supply within the directly affected communities will be improved;
- Improved marketing of farm produce for improving farm incomes;
- Provision of new sources of non-agricultural income specifically for women and young people, given the current land scarcity;
- Financial services and training to directly-affected persons
- Better access to credit for development of small-scale businesses;
- Support to recreational facilities due to their importance for a good quality of life

Related to institutional development and policies, sponsor's has committed themselves to GoU's regulation and standards as well as the safeguard policies and guidelines of IFI's. Furthermore, sponsor's has committed themselves to preserve the heritage and culture of nearby villages. Lastly, a strong grievance redress system has been elaborated and is included in the Resettlement Action Plan (RAP).

Specifically BEL will construct a visitor's centre at the HPP and a cultural centre near Bujagali Falls, and work with Jinja Tourism Development Authority (JITDA) on sustainable tourism activities for recreation related to the new reservoir.

# Lessons Learned, Innovations and Transferability

As for the LHWP project design was adjusted to enhance development opportunities, e.g. stakeholder involvement through consultative processes were significantly increased resulting in an increase in jobs and local communities, and revenue and development funds is planned for ancillary infrastructure and financial allocations. Range of benefit portfolio spans infrastructure, job enhancement and funds for local development. The Bujagali HPP also has a strong grievance redress system embedded in the RAP, and an open disclosure programme in promoting transparency and accountability.

# 4.2.2 High Aswan Dam, Egypt

# Introduction

The development of the High Aswan Dam, situated some 7 km up the Nile from the city of Aswan, was decided for in the late 1940's, since the Old Aswan Dam no longer satisfied the countries needs and the desire for comprehensive control of the Nile flow to safeguard Egypt from high floods and severe droughts as well as water needed for irrigated agriculture. Thus construction started in 1960. The dam was completed in 1967, whereas the 12 turbines for hydropower generation were operational in 1970. Inauguration of the project was in March 1971 (Abu-Zeid et al. 1997).



# Figure 16. Panorama view of High Aswan Dam (Picture: Benjamin Frank 2005, from Wikipedia).

The High Aswan Dam constitutes the following salient features:

# Technical data

- A rockfill dam with grout curtain and clay core
- Total crest length of 360 m and height 111 m above river bed
- A reservoir capacity of 162 km<sup>3</sup> with a 500 km long reservoir extending into Sudan
- 12 installed hydropower turbines, each of 175 MW, totaling 2100 MW, with a generating capacity of some 10<sup>9</sup> kWh per year
- Connections both to the national and local electricity grid

The Main Usage and Benefits derived from the Dam are the following.

- Downstream flow control for matching actual water needs for different requirements
- Protection from high floods and drought hazards due to variations in the Nile flow
- Irrigation expansion: (i) Change from basin irrigation (one crop per year), to perennial irrigation (two or more crops per year) including expansion in rice and sugarcane cultivation, and (ii) land expansion by reclaiming new land for irrigation.
- Generation of hydropower to the national and local grid
- Improvement of navigation throughout the Nile
- Fisheries on Lake Nasser

# Main Environmental Social and Impacts

Although HAD's manifold benefits, it became a symbol of environmental and social problems caused by a large scale development project (Ahmed 1999). Some argue that this is partly due to its links to superpower politics and that in retrospect a more balanced assessment should have been credited the development of it (Biswas 2002). The major impacts of the dam constitute however:

- A change in water quality due to less discharge, and a practically silt-free river flow. This has
  changed bed and bank erosion. The siltation in Lake Nasser has also caused correspondent
  erosion and land loss in the Mediterranean coastal areas due to the trapping of sediments that
  normally was transported down to the delta areas during especially flood periods.
- Less silt downstream the impoundment has also led to degradation of soil fertility, sparking the use of chemical fertilisers. These fertilizers have affected the agricultural drainage water, which in many cases are routed back to the agricultural and domestic water systems.
- Salinity and water logging problems due to over irrigation of lands, increase in cropping intensity and expansion of rice and sugarcane cultivation

- Propagation of scistosomiases and the northward migration of malaria mosquito vectors from Sudan. It is however now clear that this propagation occurred not during irrigation, but during human contact with canal water due to the absence of water-supply and sanitation facilities (Biswas 2002).
- Negative effects on fisheries in the Nile system and coastal lakes, due to the fact that
  migration of certain species were dependent on the arrival of turbid floodwater now absent.
  Furthermore, the mineral rich silt in the turbid floodwaters nourished species such as sardines
  which breed in the estuaries of the Nile. The sardine almost disappeared after post
  impoundment but during the last years it has resurged back. Scientists do not have a clear
  answer to the resurging, however it is a possibility that the sardines could have adapted to
  new ecosystem regimes in the Mediterranean sea and the Nile delta areas as well as the
  dynamics between these.
- The rise of groundwater levels, requiring new approaches to land drainage.
- Widespread growth of weeds in waterway channels as a result of inflow of silt-free water, use of fertilizers and intensification of agriculture. This has endangered the safety and effectiveness of irrigation and drainage networks and disturbed environmental conditions.
- Resettlement of between 100 120 000 Nubians and inundation and relocation of historical sites and monuments.

#### **Mitigation Measures**

The High Aswan Dam was developed at a period of time when full EIA's (including mitigation measures) and public participation normally was not part of the planning of big infrastructure development projects. Actually, not until the late 70's Environmental Impact Statements were added onto the end of previously designed projects, and only as late as the 90's real public participation started to be part of the processes (Lillehammer et al. 1999). This is also reflected in the "ad hoc" inclusion of mitigation measures and in public participation related to the development of the High Aswan Dam. Although some minor mitigation measures have been undertaken related to environment most of it is focused on resettlement of the affected Nubian population. Implementation of the resettlement suffered because of inadequate capacity, however the planning was well undertaken according to today's standards including design of new housing and choice of resettlement locations. Related to participation the Nubians were not directly involved in the policy making and planning, by which was exclusively a national and provincial government responsibility. Regardless these shortcomings the government wanted the Nubians to be better of following removal, as well as more integrated within the Egyptian Society. Plans included both compensation and development, and development would include both arable land and non-farm employment opportunities (Scudder 2003). After about 30 years, the social impact on the resettled people has been viewed remarkably positive by the population concerned (Abu-Zeid 1997), except for the Arab pastoralists that were not "in handy" of land titles, thus not compensated for loss of livelihood.

# Sharing of Benefits from the Project

It has been estimated that the cost of the dam was recovered within only few years amounting to annual returns to the national income mainly from increase in agricultural production and hydropower generation, but also from flood protection and improved navigation (Biswas 2002). Moreover it has improved management of water supply throughout the Egyptian water system (Ahmed 1999). Thus the main sharing of benefits from the dam are strongly related to the various multipurpose use. These are shortly described below.

#### Irrigated agriculture

The dam releases on average 55 billion m<sup>3</sup> of water every year by which some 46 m<sup>3</sup> billion are diverted into the irrigation canals. In the Nile Valley and delta almost 8 million feddan (a feddan is 0.42 ha) benefit from these waters producing on average 1.8 crops per year. This availability of water has secured flexibility of agricultural planning, crop patterns and crop rotation. Thus both cropping area and especially yield did increase considerably due to the dam, specifically for rice and sugar-cane.

#### Hydropower Generation

Installed capacity is 2100 MW, with all twelve turbines operational from 1971. By 1976 two transmission lines to Cairo, with west and east off-shoots to Alexandria and Port Said, had been completed. In 1974 the high dam generated some 53% of Egypt's entire energy output, whereas this number in 1998 was 16% due to construction of more capacity elsewhere (White 1988, Osman 1999). The power generation from the dam has also been successfully used in the electrification of Egypt's countryside, the running of old and new factories as well as for pumping stations for irrigation and drainage (Abu-Zeid et al. 1997).

# Flood Management and Water Security

The construction of the dam and the 1959 agreement between Egypt and Sudan managed to satisfy both countries irrigation requirements for land under cultivation and expansion plans as well as safeguarding Egypt against the periodic drought conditions<sup>23</sup>. Moreover, the dam safeguarded the Egyptian Nile Valley and the Delta against the perils of inundation due to high floods in 1964, 1975 and 1988 (Abu-Zeid et al. 1997).

#### Navigation and Tourism

The dam has improved navigation along the river, both upstream and downstream down to the Mediterranean. This has resulted in an increase in the efficiency of transport economics. Improved navigation has also affected tourism positively (e.g sailing along the Nile from Cairo to Aswan). Moreover the High Aswan Dam has itself become a tourist attraction.

# Fisheries

Fisheries has developed along Lake Nasser, reportedly with an annual production of about 35 000 tons (Abu-Zeid et al. 1997). Availability to market and landing/processing infrastructure has however been a bottleneck for the fisheries, although factories are now in operation in the vicinity of the lake.

Related to benefit sharing the design thus included considerations for, irrigation expansion and improvement, water supply improvement, electricity to national and local grids, flood protection, navigation improvement, and increase in fisheries – Lake Nasser. HAD also created new jobs both at national and local scale and boosted the economy of Egypt. Locally it enhanced fishing opportunities and tourism specifically and funds were set aside for local - land reclamation, housing, social services, and infrastructures.

Government and investors involved national and regional level stakeholders, however the involvement of local level communities has been criticized, especially for not including

<sup>&</sup>lt;sup>23</sup> From 1978 and 10 years onwards consecutive drought conditions persisted in Egypt and 90 000 MCM of water were released from the reservoir to compensate the "deficit" in the Nile flow.

vulnerable groups like the Arab pastoralists, albeit Nubians with land titles benefited and often increased social capital and network.

HAD was finished in early 70's and development do not comply with present day policy, guidelines and safeguards related to impact assessments and benefit sharing. However HAD's environmental and social impacts have benefited Egypt tremendously at national and local scales, and sparked for example the development of Water User Associations (WUA's) amongst others.

#### Lessons Learned, Innovations and Transferability

A review of the impacts of the High Aswan Dam based on more than 30 years of operation indicates that it has had an overall positive impact despite having contributed to various environmental problems and some discrepancy in public participation<sup>24</sup>. Thus HAD generally deserves more credit for its significant beneficial contributions to Egypt's overall social and economic contribution. The project did for example maximize benefits at large through improved flood control, enhancement of irrigation and better navigation e.g. Related to ancillary investments, funds were also set aside for land reclamation, housing, social services and infrastructure. However, if the dam had been developed today more transparency in the impact assessment and public participation process would have been required as well as more focus on mitigation and monitoring of the environmental and social impacts, including those of the loss of livelihood.

#### 4.2.3 A'Vuong HPP, Vietnam

#### Introduction

A'Vuong HPP on the A'Vuong River, a tributary of the Vu Gia River, is located in the Quang Nam Province, Central Vietnam. Power generation capacity is 210 MW. Water storage volume is 343 Mm<sup>3</sup>. The RCC dam height is 83 m. The dam crest length is 250 m and the tunnel is 5 km long. The construction started in August 2003 and it was completed in 2008.

It was selected as a pilot study for benefit sharing mechanisms in Vietnam, where the Government of Vietnam and Asian Development Bank were involved.

<sup>&</sup>lt;sup>24</sup> E.g. not to include compensation for the Arab pastoralists.



Figure 17. Picture and location of A Vuong HPP, Vietnam.

# **Benefit Sharing Programme**

The benefit sharing programme for A'Vuong HPP chosen as a pilot project led to the testing of benefit sharing models to enhance livelihoods of the project affected peoples.

Testing of 3 types of Benefit Sharing was done:

- (i) Equitable access to power services
- (ii) Revenue sharing or monetary benefit sharing
- (iii) Non-monetary benefit sharing (development and job creation)

Partnership was developed early in the project phase. These were periods where consultation led to changes in mechanisms. Various councils, including a local Benefit Sharing Council was established (also sparked by expression of needs from local organisations/groups, e.g. women's groups, minorities).

The proponent has been active in engaging communities and the authorities in the A'Vuong HPP. Thus there has been engagement of local communities, NGOs, Commune Authorities (regional government) and the ministries of the GoV. Networks have been established to facilitate decisions for benefit sharing options.

Key to the pilot project at the national level was also to trigger government benefit sharing as a policy instrument. Thus the Benefit Sharing Decree (articles based on modern thinking, bottom-up approaches, participatory processes, range of benefit sharing options) was drafted.

The project tested innovative processes – pushed by a young new generation of staff from the National Electricity Authority (NEA). A communication committee has further been set-up within NEA.

The benefit sharing programme led to the establishment of a special Fund with fund combinations rooted in the Environmental Protection Law (Environment Protection Fee, PES), Water Resources Law (Water Resources Fee, PES) and Benefit Sharing Regulations (Tariff and other options).

Viet Nam's current legal framework, finalized by ERAV - the new electricity authority embodies a wider array of benefit sharing mechanisms suited to people adversely affected by resource development projects, e.g.: (i) Equitable sharing project outputs and services (like water and energy services from dam projects) - Project-affected people are targeted within existing rural electrification programs and budgets, as appropriate; (ii) Sharing monetary benefits of resource extraction and use (also hydropower generation) - Local communities who permanently give up their land, or have their resource access permanently transformed due to the project development, can receive a share of project revenue according to a formula defined in regulations; and (iii) Non-monetary benefit sharing - People adversely affected by hydropower projects receive extra resource access entitlements to offset permanent loss or reduction of resource access (e.g. enhanced forest access rights; preferential or exclusive rights to develop reservoir fisheries, preferential rights to land downstream to practice freshwater aquaculture, etc.). The organizational setup, fund administration and delivery mechanisms of benefits are shown in Figure 18. Note the establishment of the Benefit Sharing Council and its role in allocation of grants from the funds.



Figure 18. The organizational setup, fund administration and delivery mechanisms of benefits in Vietnam (from Haas 2010).

#### Lessons learned, Innovations and Transferability

Vietnam with its new decree and policy framework around benefit sharing has employed new approaches to stakeholder involvement and community engagement to test various

models/modes of benefit sharing at a wide geographical scale (regional). The models include a wide range of actions including directly involvement of communities and PES payments. It is noted that the community engagement and involvement is significant. Although the current status of the benefit portfolio and follow-up of various mechanisms triggered in the last 2 years has to be reviewed, the A'Vuong HPP is certainly a case which has shed light on possible stakeholder involvement to shape benefit sharing mechanism. However, recent flash floods (2009), dam overflows and dam water releases have resulted in deaths and loss of local community assets in the region resulting in charged situations. This has hampered studies on the results and viability of the benefit sharing regime put in place.

# 4.2.4 Columbia Basin/Columbia Basin Trust, Canada/USA

# Introduction

The Columbia River is one of the most dominant bio-geophysical features of the Pacific Northwest in Northern America, encompassing areas in both Canada and US. Beginning high in the mountains of southeastern British Columbia, the Columbia River flows 2,000 kilometers (1,243 miles) through alpine and subalpine environments, montane forests, lava fields, semiarid grasslands, and low-elevation rainforests before entering the Pacific Ocean in Oregon (adapted from <u>www.waterencyvclopedia.com</u>). More than 400 dam structures have been built on the river and its tributaries, although those relevant for this case study are the ones covered by the Colombia Basin Treaty and Columbia Basin Trust (CBT).



Figure 19. Map over the entire Columbia River Basin.

Representatives of Canada and the US signed the Columbia River Treaty in January 17, 1961 (ratified in 1964). The most significant features of the Treaty can briefly be summarized by the following (UNDP Dams and Development Project at <u>www.unep.org</u>):

1) Canada was to provide 15.5 million acres-feet of storage by constructing dams at Lower Arrow Lake, Duncan Lake and Mica Creek.

2) Canada was to operate the amounts of storage for flood control purposes in accordance with principles set forth in the Treaty, for a period of 60 years, for which Canada was to be paid \$64.4 million US by the US for flood control benefits on the commencement of respective storage operations.

3) Canada was entitled to one-half of the downstream power benefits, that is, additional power generated in the US at existing dams as a result of river regulation by upstream storage in Canada. Portions of the Canadian entitlement could be sold in the US.

4) The US was to have the option of commencing construction of the Libby storage dam (Montana) on the Kootenay River, and Canada was to provide the associated land.

The above dams improved flood control and power production capacities in both countries.

#### Main Social and Environmental Impacts and Mitigation Measures

During the creation of the Columbia River Treaty, there was a lack of consultation and public involvement of the residents of the Canadian Columbia Basin, even though they were the ones most impacted (UNDP Dams and Development Project at <u>www.unep.org</u>). The following is the highlights of the impacts:

- Two thousand three hundred (2,300) people along the Arrow Lakes and the Koocanusa, Duncan and Kinbasket reservoirs were displaced.
- Sixty thousand hectares (500 square kilometers) of high-value, valley-bottom land was flooded.
- Numerous First Nations traditional, archaeological and burial sites were submerged or buried.
- Areas that were critical to the cultural, economic and environmental well-being of the region were lost.

The region is still dealing with the following impacts from the rise and fall of water levels:

- Recreation on reservoirs is limited because of the large seasonal fluctuations of water levels, thereby limiting potential economic development through tourism.
- Fish and wildlife species and populations are impacted by the loss of key habitat and this increases pressures on residual low elevation areas.
- Dust storms around reservoirs impact human health at times of low water.
- Transportation infrastructure in the region is more complex and difficult to maintain.
- Agriculture and forestry activities are limited due to the loss of fertile, low-elevation land.

# Benefit Sharing Programme

In 1995, the Columbia Basin Trust was formed with a unique mandate to support the efforts of the people of the Basin to create a legacy of social, economic and environmental wellbeing in the region affected by the Columbia River Treaty (UNDP Dams and Development Project at <u>www.unep.org</u>). Through a financial agreement with the Province of B.C., the Columbia Basin Trust was endowed with USD 295 million of capital funding, equivalent to approximately five per cent of the downstream benefits owned by the Province of B.C. Of the USD 295 million, USD 250 million of the capital was identified for investment in joint venture power projects with the Province of B.C. (through Columbia Power Corporation who invested a further USD 250 million), and USD 45 million is considered to be endowment capital for the Trust to invest on their own (UNDP Dams and Development Project at <u>www.unep.org</u>).

Under the terms of the Columbia Basin Trust Act, the Trust was required, within two years of the appointment of the first directors of the corporation, to prepare a long term Columbia Basin Management Plan setting out the corporation's objectives, priorities and programs. The programs presented in the Plan include long-term goals and short-term objectives which guide the CBTs annual work plan and budget (UNDP Dams and Development Project at www.unep.org).

Public consultation was sought throughout the development of the Plan. In addition to symposia held in 1995 and 1997, focus groups and information sessions were held throughout the Basin to ensure that the Plan was the creation of the people of the Basin. In 1997, the Board of Directors of the Trust approved the Columbia Basin Management Plan.

As set out in the Plan, the two core functions of the Trust are (UNDP Dams and Development Project at <u>www.unep.org</u>):

- To invest the capital and manage the assets of the Trust; and
- To spend the income earned from the Trusts investments to deliver benefits to the region.

These two core functions are the basis of the Trusts Investment and Spending Programs. The Plan sets out the goals and objectives of each Program. The Columbia Basin Management Plan set the stage for investments in power projects at existing dams located in the Canadian part of the Columbia river basin e.g.; purchasing and upgrading of Brilliant Generation Station; construction of Keenleyside power plant project (Arrow Lakes) and construction of Brilliant expansion project. Besides investing in the power projects mentioned above that also delivers electricity to the people in the basin the investment program to deliver benefits to the region covers private placement and market securities.

Private placement includes all investments CBT makes in businesses located in the Colombia basin region, and constitute amongst others; real estate that offer a range of services to the basin residents; direct lending in basin-based businesses managed exclusively by CBT; and investment in basin-based businesses. CBT's priority investment opportunities is in the Colombia basin, however, given the limitations of the region there is also a balance of funds that is also invested in a portfolio of market securities, thus covering a broader geographic scale than the basin solely (www.cbt.org).

Specific programs related to benefit sharing that CBT has committed itself to include amongst others the following (CBT 2009):

*EIP Granting* – Funding community projects in the Basin which addresses or aims to reduce the impacts humans have on ecosystems, through education, stewardship, conservation and/or restoration.

*Education in the Wild Program* – CBT is a founding and continual supporter of a school based, ecosystem awareness program that support teachers in delivering lessons through hands on, outdoor learning opportunities for students.

*Columbia Basin Environmental Education Network* – CBT initially facilitated the evolution of this umbrella network which fosters environmental education initiatives, stewardship and sustainability in the Basin through a diverse membership of individuals and organizations. CBT continues to support their ongoing activities.

*Land Conservation Initiative* – Provides funding towards land conservation efforts which will assist in maintaining a range of community values on lands in the Basin.

*East Kootenay Conservation Program* – CBT supports this partnership to promote habitat and ecosystem management for private land, while balancing social and economic needs.

#### Lessons Learned, Innovations and Transferability

The process leading to the development of the 1997 Columbia Basin Management Plan was, a comprehensive process in that it considered options for the investment of the Trusts investment in benefit sharing initiatives. The public came to view the investment of the endowment in hydro projects at existing dams as a means of creating a sustainable cash flow to benefit communities in the Columbia Basin. This was seen to be an appropriate way of recognizing the past adverse impacts of dam construction on basin residents and on basin ecology (UNDP Dams and Development Project at <u>www.unep.org</u>).

Thus a comprehensive consultation with basin residents to develop an agreed basin plan, highlighting benefit sharing mechanisms as part of the implementation, established a strong planning framework for subsequent power projects. This latter encapsulates the Loucks (2003) interpretation of developing hydropower and water infrastructure within an IWRM framework<sup>25</sup> strongly in order to maximize benefits.

The public involvement process used to develop the 1997 Columbia Basin Management Plan resulted in very strong public support for the CBT power project investments. This contributed substantially to the CBT applications for regulatory approvals for the 185 MW Keenleyside Power project in 1998 and the 120 MW Brilliant Expansion project in 2001 (UNDP Dams and Development Project at <u>www.unep.org</u>). Furthermore community support greatly enhanced the likelihood of a successful outcome of the regulatory process that also included benefit sharing mechanisms.

<sup>&</sup>lt;sup>25</sup> "The interdependence of system components and decisions strongly argues for managing them in and integrated, holistic, sustainable, manner if maximum benefits are to be obtained from them"

# 4.3 Highlights of Cases – Focal and Extended Case Studies

This chapter extracts the highlights key issues and mechanisms for the focal and extended case study review's and is summarized in table 7 below. Additionally some key quantitative figures are given for the focal case studies in Table 8.

Case Study	Typology (mechanism)	Aspect of Typology	Beneficiary Group and social/environment component	Process followed and outcomes
Focal Case	Studies			
LHWP	Institutions, Policies and Capacity Building	Transboundary regulatory framework for water diversion to RSA and electricity generation from Muela HPP mainly to Lesotho.	Government of Lesotho and RSA.	Was undertaken as a result of the Treaty arrangements from 1986. Water diversion to RSA and electricity generation to Lesotho started in 1998.
LHWP	Financial allocations	Royalties related to cost saving (LHWP instead of OVTS) + royalties related to sale of water.	Government of Lesotho and businesses (cost saving royalties) and funds set aside for local development (royalties related to sale of water).	Cost saving royalties paid consecutively since 1998 and amounts a total of 2.9 billion Maluti up to 2010. Has affected the economy of especially Lesotho government positively during this period. Water sales royalties totally reinvested in a revenue fund (Lesotho Fund for Community Development) and allowed for the creation of job opportunities and other development projects for local communities.
LHWP	Ancillary investments	Investments in infrastructure (roads, bridges, power lines, housing and telecommunication e.g.).	Government of Lesotho, Basotho nationals, local communities in the highland.	Undertaken due to "opening" of the highlands both for the project and needs from the communities. Affected local business development and commerce positively
LHWP	Institutions, Policies and Capacity Building	Capacity building of local communities (agricultural production, fisheries, awareness and education.	Local communities	Training in recreational fishing, establishment of mountain horticulture and field crops programme, e.g., skills transfer.
Khimti 1	Institutions, Policies and Capacity Building (non- monetary)	Establishing local institutions. Establishing public private partnerships. Creation of user groups (e.g. the KREC cooperative). Partnership with UNDP.	Helped expanding rural electrification for the local farming communities.	Allowing neutral organizations (NGOs) to facilitate and manage (partly) implementation programme (with KREC). Community initiated needs led to community level institutions (user groups) which facilitated benefit sharing interventions. Significant number of household having electricity through a stage-wise process over time. The degree of acceptance is very high.

# Table 7. Key issues from focal and extended

Case Study	Typology (mechanism)	Aspect of Typology	Beneficiary Group and social/environment component	Process followed and outcomes
Khimti 1	Ancillary Investments	Non-monetary and monetary inputs to enhancing health and education services in addition to water supply systems (irrigation and drinking water). Enhancing user group roles.	Local communities and affected people.	Community initiated needs led to community level institutions (user groups) which facilitated benefit sharing interventions. Significant improvement of general public health, education and water supply situation e.g. in the community.
Angostura	Ancillary Investments	In-kind support to catchment treatment/protection initiatives. Enhance agricultural productivity and sustainable soil use through provision of equipment for agricultural production under steep slopes, biodigestors.	Local communities due to improved productivity and incomes. Project owner and communities due to reduced erosion in the watershed and sedimentation of reservoirs.	Limited participation of communities or local organizations in design phase. Increased level of participation of beneficiaries –but mostly ad- hoc – during implementation phase.
Angostura	Institutions, Policies and Capacity Building	Institutional initiatives, such as the creation of COMCURE. Enhance agricultural productivity and sustainable soil use through capacity building among farmers and farmers associations.	Project owner, public institutions and local communities increase dialogue and participation.	Power company, together with public institutions, local authorities and community representatives participate in the steering committee of the river basin organization.
Angostura	Financial allocations	Water fees paid by hydropower company for water use (water canon).	Communities in the river basin should benefit from conservation and restoration investments undertaken using the collected fees.	Collections from water fees are to be invested in same river basin – however since this procedures is still in early phase – there are no easy to find registers about application of funds.
San Carlos	Institutions, Policies	National framework for proper compensation and sharing of benefits with local communities and river basin (Law 56 and Law 99)	Regional environmental authority (CORNARE) and (15) Municipal administrations.	Strengthened Regional Environmental Authority and Municipal finances.
San Carlos	Financial allocations	Transfers, fees, taxes, contributions to rural electrification funds.	Collected funds should be invested in natural resources restoration/conservation initiatives; in water supply and sanitation projects and support to rural electrification funds.	Creation of new, and modification of existing legislation. Established a framework for monetary transfers to local/regional levels.
San Carlos	Financial allocations	Co-financing projects as part of the Community Development Program.	Enhanced benefits for neighboring communities.	Program was conceived by the Company; but project proposals are developed and implemented in a highly participatory manner with beneficiaries and local authorities.

Case Study	Typology (mechanism)	Aspect of Typology	Beneficiary Group and social/environment component	Process followed and outcomes
San Carlos	Ancillary Investments	Support a wide variety of local development initiatives – mainly through collaboration agreements with relevant public and private institutions.	Enhanced benefits for neighboring communities. Strengthened local organizations.	
GLB	Project Design and Operations	Integrated operation of basin reservoirs.	HPP producers, project owners and stakeholders at large (e.g. related to flood management).	Part of the mission of the G&L Water Association. Operation rules also vested in the concession system. The integrated management has shown to be of large economic value.
GLB	Financial Allocations	Taxes, license fees, business development funds.	Municipal and County level.	Part of the license and concession system.
			Local land owners.	ownership by municipalities/communities. Local acceptance.
GLB	Institutions and Policies and Capacity Building	A mature regulatory system for distribution of monetary benefits.	Municipality, County, Basin and State level.	Part of the Norwegian license and concession system.
NT2	Financial Allocation Capacity needs for management of funds	Funds from revenues to the Government. Capacity building to manage funds.	Government and eventually provinces, districts and communities if funds are used for development purposes as planned	The revenue allocation was part of the Concession Agreement, and thus a requirement of the GoL for the project. To assure management of funds capacity and a management system has been highly necessary and this has been the first focus as revenue allocation started after operation in 2010.
NT2	Ancillary Investments	Enhancement of public health.	Affected communities and communities at-large in the region (3 provinces).	Strong participatory process followed which allowed for formulation of interventions and high acceptance and positive outcomes on health.
		Conservation of forest biodiversity.	Watershed conservation and communities associated with these areas.	The autonomous body formed for watershed management has responsibility to cover both social and environmental development aspects.

Case Study	Typology (mechanism)	Aspect of Typology	Beneficiary Group and social/environment component	Process followed and outcomes
NT2	Policy and local institutions – tenure security	Tenure Security over natural resources and land. Local institutions.	Local communities affected by the project. Land and forest management authorities through some capacity building for managing measures related to land and forests.	The mitigation was continued into an elaborated tenure securing regime, where affected people have exclusive rights of fishing (in the reservoir), own plots of agricultural land, and have a forest under a concession agreement for 70 years. Through participatory processes several functioning local institutions (also user groups) have been formed.
NT2	Institutions through partnerships	Private-public partnerships (PPPs)	Central and Local government, local communities	PPPs have been formed in several sectors including health, agriculture, conservations-biodiversity, which have led to institutions which have been essential for the formulation and implementation of benefit sharing interventions. The presence of PPPs has acted as precursors for the development of benefit sharing mechanisms.
Extended ca	ase study review			
Bujagali	Ancillary Investments	Strong stakeholder involvement trough consultative processes.	Local communities.	After a "negative" first phase stakeholder involvement was improved. This lead to increase in jobs for local communities, funds for local development.
Bujagali	Institutions, Policies/C.B	Strong grievances redress system.	Local communities and affected people	Part of the Resettlement Action Plan (RAP)
High Aswan Dam	Projects Design and Operations	Maximized benefits through improved flood control, irrigation, navigation e.g.	Society at large, local communities (for example through improved irrigation).	Had great impact on benefits derived from irrigation agriculture, hydropower generation, flood management and water security, navigation, tourism and fisheries.
High Aswan Dam	Ancillary Investments	Set aside funds for land reclamation, housing, social services and infrastructure.	Local communities.	
A'Vuong	Institutions, Policies and Capacity Building	Strong national framework for sharing of benefits, including institutions.	Local communities and affected people.	Pilot studies for testing of BS mechanisms embedded in the regulatory framework.
A'Vuong	Ancillary Investments	Set aside funds for communities and affected people.	Local communities and affected people.	Pilot studies for testing of monetary (and non-monetary) BS mechanisms.
Columbia basin/CBT	Design and Operations	Transboundary flood protection benefits.	Project owners, provinces and local communities.	Embedded in the Columbia Basin Treaty and not part of the mission of CBT as such.
Columbia basin/CBT	Ancillary Investments	Investment in business dev. programs, education and ecosystem protection.	Provinces and local communities.	An outcome of the Columbia Basin Management Plan amongst others.

# Table 8. Some key quantitative features of the development funds of focal case studies<sup>26</sup>.

Case Study	Cost of Project	Amount of Fund for Benefit	Numbers and
		Sharing	Beneficiaries
LHWP	Approximately 1.5 billion USD	In 2006 Lesotho Fund for Community Development received 35 million USD.	Basically unknown but 2545 VIP latrines were provided highlands communities during Phase 1B besides other local infrastructure and projects.
Khimti 1 HPP	140 million USD	Total investment in electrification and community development was approximately USD 10 million. Main areas constituted amongst others:	
		Rural Electrification	8000 households
		Microenterprise support	170
		Drinking water	40 systems
		Irrigation	20 systems
		Training for income generation	1800 people
Angostura HPP	280 million USD	Agroforestry and Livestock program = 868 000 USD	2000 farmers
		Vegetative Cover Program = 683 000 USD	3000 persons
		Environmental Education Program = 252 000 USD	100 schools, 50 instructors and over 3000 students
San Carlos HPP	Unknown/not provided	Community Development Program = 665 000 USD	Beneficiaries in over 20 wards
		Complementary social investment = 460 000 USD	23 municipalities of Eastern Antioquia
		Institutional Corporation Program = 225 000 USD	San Carlos Municipality and surrounding communities
G&L basin	40 regulation reservoirs/HPP's developed over a period of over 100 years	Scarce data from older projects however two examples are the Aursund HPP and Osen HPP. For Aursund HPP funds for local services and industry development amounted 16 million NOK, whereas for OSEN HPP it was 8 million NOK.	Local service providers and industry.
NT2 HPP	1.3 billion USD	Management and Conservation of NNT NBCA = 31.5 million USD	People/communities living within the watershed + strengthening of WMPA.

<sup>&</sup>lt;sup>26</sup> More details are found in the case study reports and to some extent also in Appendix 4.

# 5. OPERATIONALIZING BENEFIT SHARING

# 5.1 Defining Benefit Sharing

# 5.1.1 A Working Definition

To further opertationalize the preliminary working definition of benefit sharing we provided in Chapter 3.2, and also based on the assessment from the case studies, we see the need to include who are the major developers (government and project proponents) and recipient (stakeholders) of the framework and benefit sharing mechanisms. This is reflected in the final proposed working definition below and in the box defining who are the stakeholders to benefit. Furthermore we also define the spatial and temporal scales in the box below, whilst the principles of sustainability is given in Appendix 3, as theses are integral to our working definition. Thus our proposed working definition reads as follows:

"A framework for governments and project proponents to maximize and distribute benefits across stakeholders, through relevant spatial and temporal scales by use of various mechanisms, and consistent with the principles of sustainability"

Given this definition it is expected that it will assist in distribution of benefits in a fair, equitable and timely manner to the relevant stakeholders at stake, as defined in the box to the right, in any given new HPP and water infrastructure development.

#### Who are the stakeholders that should benefit?

Most commonly;

- Local communities
- Displaced people
- Local/Regional Government
- Project Owners
- National Government

#### And where relevant;

- Transnational and River Basin Organisations
- Special Interest Groups
  - Private Sector

#### Spatial and temporal scales: What are they?

**Spatial scale** refers to the scale of geographic coverage the benefit sharing mechanisms of a HPP/water infrastructure project has (as such it also has a demographic component tied to it; e.g. population size). Spatial scale in a project can thus refer to (from small to large subsequently); local communities; municipalities/counties; watershed and river basins; region and nationwide; cross county/transnational (note that river basins can be transnational and that especially watersheds can reside within municipalities and counties).

**Temporal scale** relates to at which timeline the various benefit sharing mechanisms are working; e.g. on short, medium and long term scales. A sustainable project should have mechanisms working at all scales. It is important to note that it should be *the pool of mechanisms* from a project that needs to work across these various time scales, since mechanisms may have various timespans, and some mechanisms need to be in place before others can function. Further to this is when in the lifeline of investment projects different benefit sharing mechanisms should be considered and implemented; e.g. during planning, construction, operation and beyond.

#### 5.1.2 Compensation vis – a vis Benefit Sharing

The compensation vis-a-vis benefit sharing is a significant issue that needs to be discussed and elaborated further as it is central to long term sustainability of HPP development. The dilemma remains in distinguishing where the line is to be drawn, as this also can be case/project specific. Normally mitigations are to be found in commitments related to the EIA and license processes, either in international guidelines or more specifically in national legislations and regulatory processes. Benefit sharing goes beyond these commitments with focus on enhancing community development related to opportunities created by the projects instead of only mitigating impacts.

In several of the case studies the complementary investments undertaken by the proponents/project owners do fall within the scope of benefit sharing mechanisms (e.g. LHWP, Khimti 1 HPP, Angostura HPP, San Carlos HPP, Nam Theun 2 HPP, Bujagali HPP and Columbia Basin. Some elements that allow characterizing them as such are: (i). beneficiaries are spread over the project influence area and are not limited to the directly affected population; and (ii) the extent of the areas of intervention, in most of these cases (sectors including education, promotion of economic activities, human rights, health etc.) appear to extend well beyond the compensation of direct/indirect impacts of hydropower construction and operation.

Below is a schematization intended to illustrate the relationship and differences between traditional compensation and mitigation measures compared to benefit sharing.



Figure 20. Flow chart showing measures which go beyond their expected obligatory limits in quality and time (PES is Payment of Ecosystem Services).

Details from some of the cases that go beyond strict compensation and mitigations are given in Appendix 4<sup>27</sup>.

# 5.2 Definition of Benefit Sharing Typologies

To enable operationality of the working definition of benefit sharing presented in Chapter 5.1. a defined framework that enables for implementation is needed. Thus a framework, with typology of mechanisms has been elaborated. Mind that our theoretical assessment and findings from the case studies has lead to a somewhat more refined typology than earlier initiatives<sup>28</sup>; and can be characterized as in Table 8 overleaf. The table also refers to the importance of the various typologies across spatial and temporal scales. The revision of the typologies and their mechanisms constitute the following (see Table 9 for details):

**Project design** / **operation:** More or less the same as earlier initiatives. Watershed management is however not as we see it part of this typology, and should rather be under Ancillary Investments. Investment in watershed management and protection can however positively affect the benefits derived from Project Design and Operation.

**Ancillary investments:** We have furthered detailed this typology and divided it in two subtypologies (see Table 9 for details). (i) <u>Physical infrastructure investments</u>: and (ii) <u>Socio-</u> <u>Environmental investments</u>.

**Direct payments/disbursements:** We suggest this terminology instead of Financial Allocations since financial allocations are also undertaken under Ancillary Investments. To differentiate it even more from the previous typology we include mainly the legally binding transfers under this typology.

**Policies and Regulatory Framework**<sup>29</sup>: In the Concept Note (2009) this was part of the Institutions, Policies and Capacity Building typology of mechanisms. We propose however to extract it as a separate typology since it is quite different from institutional and capacity building mechanisms and is very often also an enabler for the latter to function. Policies and Regulatory Framework mechanisms is also an enabler for other mechanisms, for example direct payments/disbursements.

**Institutions and Capacity building**: The mechanisms of this typology should focus on building an enabling environment for leveraging benefits within institutions and amongst stakeholders. e.g., knowledge sharing, river basin organizations, SME development, development planning capacities, joint ownership<sup>30</sup>.

<sup>29</sup> National, regional and transboundary frameworks.

<sup>&</sup>lt;sup>27</sup> Together with details from example cases where (i) integration of water management in project design as an approach to benefit sharing has been undertaken as well as (ii) ancillary investment funds has been set aside for land reclamation, housing, social services and infrastructure etc.

<sup>&</sup>lt;sup>28</sup> The WB Concept Note (2009) uses 4 main typologies, namely: Project Design and Operations; Ancillary Investments; Financial Allocations; and Policies, Institutions and Capacity Building.

<sup>&</sup>lt;sup>30</sup> Joint ownership is moved from financial allocations to this typology since we perceive the institutional issue to be most paramount.

Table 9. Suggested	d typology	of benefit	sharing	mechanisms.
			3	

Туроlоду	Description of Specific Mechanisms	Spatial Scale Dependency	Temporal Scale Importance
Project Design and Operations	Maximize benefits of flexible infrastructure and integrated resource management. E.g., multi- purpose infrastructure (flood control, irrigation, navigation, water supply, water quality improvements), integrated cascade management of reservoirs, managed flows.	Increasingly important for larger and more complex project developments.	Heavily confined to long term and most important during construction and operation.
Ancillary Investments	Investments outside core infrastructure to a broader reach of benefits. (i) <u>Physical</u> <u>infrastructure investment</u> : This include all (upgrading or creating new) infrastructure investments undertaken by the project owner directly or indirectly related to the construction or operation of the HPP/Water Infrastructure; e.g. roads, bridges and other project related	Most important at local communities, municipal/county scale, and beyond especially with roads.	Heavily confined to long term and most important during construction and operation.
	facilities e.g. and (ii) <u>Socio-Environmental</u> <u>investments</u> : These are investments not always directly related to the main project structures. For example, social infrastructure (schools, health facilities and systems), community programs (job creation and enhancement, agriculture and livestock production enhancement, SME), watershed protection investments (catchment treatment, erosion management, afforestation e.g.), tenure security.	Most important at local communities and municipal/ county scale and watershed/river basin scale if investment is in protection.	Works across all temporal scales. Implementation of mechanisms is most important during planning and construction.
Direct payments/ disbursement	Legally binding transfers related to royalties, taxes, license fees, development funds, preferential rates, revenue sharing. (Assurance of the mode of use of funds has to be ear-marked).	Works across all spatial scales depending on project.	All mechanisms but development funds in this typology is generally long term. Development funds can either be short, medium or long term.
Institutions and Capacity Building (Can also be a key enabler for benefit sharing)	Build enabling environment for leveraging benefits within institutions and amongst stakeholders. For example; knowledge sharing, river basin organizations, SME development, development planning capacities, joint ownership.	Important for organizations at all levels; from local to trans- national. Thus all spatial scales.	Heavily confined to long term and important during planning and decision-making (for participatory and ownership aspects), construction and operation.
Policies and Regulatory framework (Is also a key enabler for benefit sharing)	Legally binding mechanisms (laws, acts, concessions, licenses, Treaties) for distributing benefits across stakeholder groups. (Policies and regulations may for example trigger direct payments and disbursements).	Works across all spatial scales depending on project.	Heavily confined to long term and important during planning due to its function often as an enabler for benefit sharing (see text below).

The typology Policies and Regulatory framework can come in two *forms*. These are either as; (i) an enabler of other mechanisms (e.g. a meta-mechanism) or; (ii) as a mechanism that is spurred by a project. In the *first form* the enabler function is very often the prerequisite for other mechanisms to function, e.g. for example for direct payments/disbursement as in the G&L basin and LHWP cases, and for institutions and capacity building in the LHWP case. In

the *latter form* a project can work towards having a new mechanism/policy put in place that for example ensures royalty payments to central government and/or local communities.

Similarly, stakeholder engagement, formation or strengthening of local institutions (e.g. CBOs) and public-private partnerships (PPP) can be central in acting as enablers to define and implement benefit sharing. In several of the cases in this study the above were important foundations and pillars for making the benefit sharing mechanisms operational. Core to this is increasing the capacity of the stakeholders in question, so that they can engage in the benefit sharing mechanism itself. In several of the cases, *capacity building* increased the ability of the stakeholders to make decisions, implement and maintain projects seeded through benefit sharing process. See also the section on key enablers for benefit sharing in Chapter 5.4 for a more detailed discussion on the issue.

# 5.3 Combining Different Types of Mechanisms (Portfolio Approach)

A portfolio based approach can secure that a combination of mechanisms works at different spatial and temporal scales as discussed earlier. This approach has been undertaken in a variety of the case studies; i.e. several mechanisms are used to satisfy the wide range of needs and expectations raised by stakeholder's at large and/or local communities. This is paramount and works across trans-national, national and local scale for the LHWP (regulatory framework, institutions, financial allocations, ancillary investments e.g). For Nam Theun 2 HPP and A'Vuong HPP legal and institutional frameworks/arrangements are closely linked to benefit sharing initiatives at local level, e.g. community development and enhancement and various ancillary investments to enhance livelihood. For Angostura HPP and San Carlos HPP case studies, the two watershed management initiatives are supported by the project owners; and watershed management plans/programs are in fact "portfoliobased" interventions, which may include, among other actions; capacity building, institutional support, and ancillary investments.

A general lesson however from the case studies is that a portfolio based approach has not been pre-conceived by the project proponent/government, but is rather a result of especially mitigation extensions and development needs. Pre-conceived portfolio based approaches, and the implementation of them, might however be the result of the current benefit initiative, in the way we have been grouping them in our study.

# 5.4 Key Enablers of Benefit Sharing

# 5.4.1 Defining the Key Enablers

There are several *enablers* triggering the interest and need for benefit sharing in the development of hydropower and water resources infrastructure. The four most important are; (i) policies and regulatory framework; (ii) stakeholder engagement and community participation; (iii) partnership formation, and (iv) institutions and capacity building. These are fundamental for making benefit sharing operational and thus for the implementation success of various benefit sharing mechanisms.

- Policy and regulatory framework
- Stakeholder engagement and communication
- Partnership formation
- Institutions and Capacity building

KEY ENABLERS or PRECURSORS FOR BENEFIT SHARING PROJECTS

# Figure 21. Key enablers of benefit sharing mechanisms.

# 5.4.2 Policies and Regulatory Framework

The various case studies indicate that having a strong policy and regulatory framework becomes more important when distributing benefits at larger scales and especially between nations as in the case of the LHWP and the Columbia basin. The G&L basin study also shows that distributing direct economic benefits effectively throughout the municipalities from HPP development in the basin necessarily need to be embedded within a legal framework (laws, concessions and licences).

At a smaller scale the A'Vuong HPP case indicate that legal frameworks on benefit sharing and establishment of institutions to cater for this can be important for successful provision of benefits to local communities and affected people. The A'Vuong case is however still at a pilot stage testing benefit sharing mechanisms embedded in the new regulatory framework, so it success over time is still pending. However the Khimti 1 case show that local level mechanisms (support to local level institutions and ancillary investment programs) can work even without a regulatory framework and governmental institutions in place, given that the project proponent has the interest, and will, to share its revenues although it does not have a clear CSR policy. Having said this it is relevant to clarify that the Khimti 1 HPP owner responses were often reactive in nature and their social actions (program) was to obtain a 'social license to operate (SLO)' within the highly sensitive political climate in Nepal both locally and nationally.

Both in the Costa Rican and the Colombian cases there are legally-binding instruments demanding hydropower companies to contribute to local development; either through water use fees (as in Costa Rica) or transfers (based on gross electricity sales), taxes or rural electrification funds (in the case of Colombia). In both cases the legal framework provide the basis for the application of these funds at the local level; however in both cases the efficiency and/or transparency in the application of funds in the HPP influence areas could be improved.

# 5.4.3 Stakeholder Engagement and Community Participation and Consultation

Stakeholder engagement and community participation has shown to be important for several of the case studies. Most importantly it affects however the success of ancillary investment mechanisms working at *local scale*, but also strengthening of local institutions and to some degree financial allocations to community development programs (as for San Carlos, Costa Rica). Stakeholder engagement and community participation has shown to affect the success of benefit sharing programs specifically at local level for LHWP (difference between

Phase 1A and 1B for community enhancement and development programs), Khimti 1 HPP (enhancement of community level health service and institutions) and Nam Theun 2 HPP (e.g. enhancement of public health).

# 5.4.4 Partnership Formation

Public – private partnerships (PPPs) can be important in setting the stage for bringing stakeholders together when undertaking project formulation and implementation. PPPs can also legitimize the project in that it can be seen as part of a neutral process, and work towards gaining trust of the proponent as in the case for Khimti HPP. There are a wide range of public – private partnerships (PPPs) initiated by Nam Theun 2 Power Company (NTPC) for implementation and sustaining benefit sharing programs. In the case of NT2 HPP the PPPs can be viewed as key to; (i) triggering processes related to benefit sharing; (ii) giving defined responsibilities and; (iii) implementing benefit sharing projects, as these acts as vehicles for benefit sharing mechanisms. In other words PPPs can act as enablers or precursors to benefit sharing projects (many seeded during the mitigation phase), and in many cases are key in the final formulation of benefit sharing interventions and their subsequent implementation.

# 5.4.5 Institutions and Capacity Building

In particular medium and large infrastructure projects in rural and remote areas, as is usually the case with hydropower developments, face the challenge of weak local institutions and scarce administrative and technical capabilities in the project influence area. The need for increased capacity at the local levels is therefore also a triggering force towards successful implementation of benefit sharing (as in most of the cases in this study). Increased capacity of national and transnational institutions for large projects, as has been seen in the LHWP case, will also enable for, and thus increase the possibilities of, success for the implementation of benefit sharing mechanisms. Capacity building measures and supporting institutional strengthening among local, national and transnational institutions and their staff may be an efficient and cost-effective investment in human resources. In the long-run the hydropower producer will benefit from improved governance at the local/national/transnational levels through well organized and functioning institutions. Especially noteworthy here is also Nam Theun 2 HPP where the capacity building of the government for managing the revenue funds has secured in-house competence as the revenue funds started flowing in.

One particular feature worth mentioning when comparing the institutional arrangements in the Costa Rican and Colombian cases has to do with the existence of a river basin organization COMCURE in the Costa Rican case; whereas in the Colombian case the voluntary interventions follow more the administrative boundaries (Municipalities). However, in the Colombian case, the existence of the basin wide environmental authority (CORNARE, in the case of San Carlos HPP) may facilitate the application of the legal contributions (transfers/ fees) in the same river basin, making it more similar to the Costa Rican case mentioned above. River basin organizations have also been seen to be of great importance in the G&L basin case and the Columbia basin case. For the G&L the importance of GLB is most paramount related to integrated operation of the reservoirs in the basin and the benefits derived from it<sup>31</sup>. Integrated operation, for especially flood protection, is also very important

<sup>&</sup>lt;sup>31</sup> The Financial Allocation mechanisms are embedded in the national regulatory framework.

in the Columbia basin, however CBT is more of an investment organization than a "basin operator" like GLB, with main focus on investing in hydropower projects and ancillary infrastructure/programs (business development programs, education, and for example watershed management programs like in Costa Rica) benefiting the residents of the basin.

# 6. BEST PRACTICE AND LESSONS LEARNED

This chapter summarizes the best practice and lessons learned for the focal and extended case studies specifically. Highlights from each case are discussed in Chapter 6.1 and innovative and interesting approaches across case studies in Chapter 6.3. The importance of the various mechanisms<sup>32</sup> in the different case studies is presented in Chapter 6.2. As Chapter 4.3 focused on highlighting and comparing mechanisms solely this best practice and lessons learned has a wider focus also looking at processes and initiatives behind these mechanisms.

# 6.1 Focal and Extended Case Studies

# <u>LHWP</u>

- To have a clear policy and regulatory framework, stating how benefits are to be shared, e.g. as for the royalties in the LHWP Treaty, is important for the fair, timely and equitable distribution of benefits.
- Where there was detailed, competent, transparent, <u>collaborative</u> planning and preparation this is highly likely to result in sound outcomes enhancing benefits to the local communities, e.g as can be seen by involving local communities during Phase 1B.
- Managing and conserving the catchments ensures sustainability of the water resources and thus helps Lesotho guarantee the reliability of supply as defined in the Treaty and safeguards the benefits from the royalty revenue stream.
- The phased implementation of the project allowed for lessons learned to be incorporated into the benefit sharing programs/initiatives.

# <u>Khimti 1 HPP</u>

- Given that there is no formal national regulatory and institutional framework regarding the benefit sharing for hydropower projects, the Khimti I HPP cues towards this in the form of CSR (note no clear policy is in place) with a project specific approach. The institutional arrangements are weak and the community development activities appear more of an expansion of compensation and rehabilitation measures than distinctly benefit sharing ones. The very project specific and rapid responsiveness to community needs/request on the company's part have been successful. There is however, a lack of effective monitoring, evaluation and feedback mechanisms. Similarly there is some lack of participatory initiatives from the project owner, which could have targeted interventions earlier and made the proponent's responses less reactive in nature.
- At least two key innovative approaches can be identified from the experience of Khimti I HPP. The first one is trying to bring in other donors within its community development framework especially as a third and neutral agency. The other innovative approach was its success to expand its rural electrification by organizing the beneficiaries into a cooperative namely KREC, an entity established and owned by the users themselves – the establishment of public-private partnerships.

<sup>&</sup>lt;sup>32</sup> Our revised typology of mechanisms portrayed in Chapter 5.2., Table 8,

# Angostura HPP

- The ancillary investments undertaken by the COMCURE's programs have led to a
  decrease in the erosion and sedimentation problems in the watershed, as desired by
  ICE. The beneficiaries participating in these programs and living in the communities
  recognize economic and social benefits from the biophysical interventions. ICE is
  regarded to have a good image/reputation within the region, and is seen as a key
  factor for local development. One risk of course is when communities perceive the
  social investments of the power company as a substitute to responsibilities or roles
  corresponding to other public institutions.
- It seems that ancillary investments are triggered by, and thus may be transferable to, other cases when they are also valued as positive by the developer. In addition, the example from the establishment of a river basin organization has lead to the elaboration of watershed management plans in other watersheds with hydropower facilities. However, there are still some challenges to be overcome; it is not clear whether ICE has any defined policy or specific guidelines in order to establish watershed management plans in every watershed they have presence. Currently, the existing watershed management plans depend very much upon the directors of each individual hydropower project. In the case of the COMCURE it is clear that its very existence and success have been dependent upon the presence of the legal basis.
- The disbursements/direct payments (e.g. water fees) as an instrument for enhancing benefits may be transferable to other cases as long as legislation and an enabling institutional framework are in place. In the Costa Rican case, one challenge for increased efficiency and transparency in the collection and use of the collected fees from the hydropower company is to be able to track the application of funds in the same territory (river basin) where the collection has taken place.

# San Carlos HPP

- The existing legal framework in Colombia provides the basis for financing local development initiatives through contributions from the hydropower companies. In particular, Law 56 from 1981 and the modifications introduced by Law 99 from 1993 established a framework, including taxes, fees, transfers from the generation companies to local and regional administrations and the creation of rural electrification funds. These monetary contributions provide the financial resources for enhancing local development in the areas of influence of hydropower generation facilities. There is however, still need for improving the efficiency in the use of these resources and provide a more dynamic administrative framework for the application of these funds.
- ISAGEN has been very active promoting awareness and defense of human rights in their projects influence areas. This is probably not a very common field of intervention for standard hydropower companies. However, given the specific circumstances faced by civil society in Colombia in general and in the project influence areas in particular, ISAGEN has considered this to also be a relevant aspect to devote efforts and resources as part of their voluntary contributions to local development.
- The co-financing approach used by ISAGEN to contribute and enhance benefits among neighboring communities has shown to be appropriate. This approach encourages interested communities to become partners in their development

initiatives instead of passive receptors. In this way the local communities feel more empowered and assume much more responsibility in the projects, increasing the chances for success.

 Another important development dimension to be highlighted is the capability of transferring benefits from the hydropower company beyond the areas of influence of their facilities through the contributions to the rural electrification funds. Since, the rural electrification funds are of national character with focus in more isolated (and poor) regions, the contributions from the hydropower companies may contribute to improve income distribution region-wise.

#### Glomma and Laagen Basin/GLB

- The step by step development (as for LHWP) history/process of hydropower and dams in the basin has reduced the conflicts to other user interests and sectors and maximized the benefits across user groups.
- A sound and mature regulatory system embedded within the various laws, acts and their associated concession and licensing processes has ensured that benefits from hydropower and dams development has been spread equitable across and amongst local, regional and national scales. As such, this case demonstrates that to have a clear regulatory framework, stating how benefits are to be shared is important for the fair, timely and equitable distribution of benefits across the basin.
- Managing basin operation in an integrated fashion as undertaken by GLB ensures sustainable use of the water resources (including flood management), optimal water usage to the users, and thus helps GLB guarantee the reliability of supply to the hydropower industry in the basin. *The value of having this ability to regulate the water in the basin at an integrated level is estimated close to 0.7 billion NOK* (GLB 2009).

# Nam Theun 2 HPP

- The NT2 HPP development has been undertaken with a strong participatory approach and with the formation of public-private partnerships which have been key for enabling benefit sharing.
- An early vision of these interventions was anchored in the ESIA recommendations, by which continued through the mitigation process and beyond, and adaptive measures were central to the current success and community acceptability.
- Provisions of funds is important for enhancement of public health and ecosystem conservation as well as forest protection
- Revenue allocations to the government can potentially have significant development impacts. Capacity building to management funds is also important. Inclusion of such allocations in the Concession Agreement, or creation of a policy and possibly the earmarking of the use of funds may be options to consider in a project.
- Securing rights for affected people over a wide range of diverse resources (fish, forest, land), may be key to developing sustainable livelihoods.

# <u>Bujagali HPP</u>

As for the LHWP project, after initial critique, the Bujagali HPP was adjusted to;

- Enhance the local development opportunities, such as direct and indirect employment opportunities, agricultural practices and better access to credit for small scale businesses, e.g.
- Stakeholder involvement through consultative processes was significantly increased resulting in an increase in jobs and local communities, revenue and development funds are planned for ancillary infrastructure and financial allocations.
- The Bujagali HPP also has a strong grievance redress system embedded within the RAP, and an open disclosure programme in promoting transparency and accountability.

#### <u>High Aswan Dam</u>

- A review of the impacts of the High Aswan Dam based on more than 30 years of operation indicates that it has had an overall positive impact despite having contributed to various environmental problems and some discrepancy in public participation. Thus HAD generally deserves more credit for its significant beneficial contributions to Egypt's overall social and economic development.
- The project did for example maximize benefits at large through improved flood control, enhancement of irrigation and better navigation. Ancillary investments funds were also set aside for land reclamation, housing, social services and infrastructure.
- However, if the dam had been developed today more transparency in the impact assessment and public participation process would have been required as well as more focus on mitigation and monitoring of the environmental and social impacts, including those of the loss of livelihood.

# <u>A'Vuong HPP</u>

- Vietnam with its new decree and policy framework around benefit sharing has employed new approaches to stakeholder involvement, community engagement to test various models/modes of benefit sharing at a wide geographical scale (regional). The models include a wide range of actions including directly involvement of communities and PES payments. The community engagement and involvement is significant.
- Although the current status of the benefit portfolio and follow-up of various mechanisms triggered in the last 2 years has to be reviewed, the A'Vuong HPP is certainly a case which has shed light on possible stakeholder involvement to shape benefit sharing mechanism.

# Columbia Basin/CBT

• The process leading to the development of the 1997 Columbia Basin Management Plan was, a comprehensive process in that it considered options for the investment by the Trusts in benefit sharing initiatives. The public came to view the investment of the endowment in hydro projects at existing dams as a means of creating a sustainable cash flow, to benefit communities in the Columbia Basin. Thus a comprehensive consultation, with basin residents, to develop an agreed basin plan, highlighting benefit sharing mechanisms as part of the implementation, established a strong planning framework for subsequent power projects.

 The public involvement process used to develop the 1997 Columbia Basin Management Plan resulted in very strong public support for the CBT power project investments. This contributed substantially to the CBT applications for regulatory approvals for the Keenleyside power project in 1998 and the Brilliant expansion project in 2001 (UNDP Dams and Development Project at <u>www.unep.org</u>). Furthermore community support greatly enhanced the likelihood of a successful outcome of the regulatory process, that also included benefit sharing mechanisms.

# *6.2* The Importance of the Various Mechanisms and Spatial Scale, in the Case Studies

The importance (frequency of use) of the various benefit sharing typologies in our case studies is reflected in Table 10 below.

Mechanisms Case Study	Project Design and Operations	Ancillary Investments	Direct Payment/ Disbursement	Institutions and Capacity Building	Policies and Regulatory Framework
Khimti 1 – Nepal	$\bigcirc$	•		•	
LHWP – Lesotho/RSA	$\bigcirc$	$\circ$	•	0	•
Angostura – Costa Rica	•	•	•	•	0
San Carlos – Colombia	0	•	•	•	•
G&L Basin – Norway	•	0	•	0	•
Nam Theun 2 – Laos	•	•	•	•	•
Bujagali – Uganda	$\bigcirc$	•	0	0	ightarrow
HAD – Egypt	•	ightarrow	0	0	0
A'Vuong – Vietnam	0	•	$\bigcirc$	•	
Columbia Basin – Canada/USA	•	•	0	0	•

# Table 10. Frequency of use of different mechanisms.

Central in the portfolio Present but not central Almost or fully absent

Note that ancillary investments are the most common central set of mechanisms across the selected case studies, and that policies and regulatory framework is central or present across all studies except HAD which was developed long ago under a different political regime. The fact that this mechanism typology is being employed often may not be unusual due to the wide range of sectors it can encompass. It can also easily be a carry-over or enhancement of traditional environmental and social mitigation. In most cases in our study the latter occurred often, i.e., benefit sharing projects had their roots in suggestions made in the ESMP. This anchoring in the ESMP may also allow for easier stakeholder engagement

about issues of concern. Many of the benefit sharing projects were intimately tied with local development needs and livelihoods – which is usually well executed in ESIA's.

By comparing the case studies it becomes apparent that benefits derived from Project Design and Operation becomes increasingly important for larger more complex project developments as can be seen for the HAD, NT2 HPP, G&L- and Columbia basins specifically, e.g. by benefiting flood protection, irrigation amongst others. Direct Payment/Disbursement, Policies and Regulatory Framework as well as Institutions and Capacity Building can be important across scales, whereas Ancillary investments are more confined to local scale initiatives<sup>33</sup>.

The scale issue is further outlined in Table 11 below which shows benefit sharing programs/mechanisms working at various spatial scales and the importance related to this scale for each case study.

Spatial Scale	Local community	Region	National government	Transboundary		
Knimti I – Nepai	•		$\bigcirc$	0		
LHWP – Lesotho/RSA	•	0	•	•		
Angostura – Costa Rica	•	•	•	0		
San Carlos –				0		
Colombia		<b>—</b>		)		
G&L Basin – Norway	$\bigcirc$	•	0	0		
Nam Theun 2 – Laos	•	•	•	0		
Bujagali – Uganda	•	•	0	0		
HAD – Egypt	•	•	•	0		
A'Vuong – Vietnam	•	•	•	0		
Columbia Basin – Canada/USA	•	•	•	•		
Pre-defined and/or central 👝						
Present but not central						
Almost or fully absent						

#### Table 11. Benefit sharing programs with its importance at various spatial scales

As can be seen and expected the benefit sharing programs/mechanisms at local community and regional scale are the most frequent and central. Related to their importance at the national level, LHWP and NT2 HPP stand out. LHWP and Columbia basin are the only two transboundary cases and this is reflected in the table above.

<sup>&</sup>lt;sup>33</sup> Although watershed management mechanisms and other ancillary investments in cascade and basin development can work across larger scales.

# 6.3 Innovative and Interesting Approaches Across Case Studies

The following are the key lessons assessed to be the most important, innovative and interesting approaches that are seen amongst and across the case studies.

- Stepwise development and phased implementation allows for lessons learned to be incorporated in benefit sharing programs, e.g. especially as seen in the cases of LHWP and G&L basin. Equally relevant is that the adaptive management has been vital for the Nam Theun 2 and Khimti HPP projects, and in the former case it has also been a key driving force. Lessons from adaptive management approaches are also found in the Angostura and San Carlos HPP's.
- Results from the various case studies indicate that sound legal frameworks and institutional arrangements become more important when implementing benefit sharing mechanisms across larger scales and more complex geopolitical settings. At smaller scales and simpler project developments, local level benefit sharing initiatives can however function without this framework/arrangements given a good dialogue between proponent/project owner and local community, and due to the fact that the proponent see that this can benefit the project in the long run. The Khimti 1 HPP case shows that local level mechanisms can work without a legal framework and institutional arrangements in place, given that the project owner has the interest and sees it as a necessity (securing community good will) for sustainable and successful development and operation of the project. Nevertheless this does not reduce the importance of the presence of regulatory systems.
- The policy and regulatory framework is an enabler (meta-mechanism) that affects especially direct payments/disbursement (e.g. royalties, taxes etc. like in the LHWP, G&L basin, Angostura HPP and San Carlos HPP cases) but also project design and operation mechanisms (e.g. operation rules of reservoirs as in the G&L case through concessions and licenses) as well as institutions and capacity building mechanisms (especially establishment of institutions enacted in laws and regulations). Ancillary investment, however, doesn't necessarily need this enabler (meta-mechanism) to be successfully implemented as has been seen in the Khimti 1 HPP case, where the nature of the proponent played an important role.
- The Vietnam legislation is innovative in its own kind, with its new decree and policy framework around benefit sharing. It has employed new approaches to stakeholder involvement, community engagement to 'test various models/modes of benefit sharing at a wide geographical scale (regional). The models include a wide range of actions including direct involvement of communities and payments for ecological services. Note that the outcome of the new approaches still needs to be studied. Finally, national legal requirements for revenue contributions to the state, although present in some cases (e.g., Nepal, Vietnam, Lao PDR), do not always define the way the funds are to be used.
- In Costa Rica the actions from the COMCURE's watershed protection programs, with investments financed by contributions from water fees and payments for ecological services have led to a decrease in the erosion and sedimentation problems in the watershed benefiting both the project owner and the local communities.
- Related to stakeholder involvement in the various phases of project planning/operation (project life cycle) there are large differences between the case studies. This is somewhat reflected by the historical setting the case studies were

developed (pre 90ties, pre WCD and bank guidelines) as for HAD, LHWP Phase 1A and most of the G&L basin development where involvement in the planning has been limited. In more recent developments like the LHWP Phase 1B, Nam Theun 2 HPP and the "new" Bujagali HPP stakeholder involvement in especially ancillary investment and community development throughout the project phases has been implemented and proven successful. For the Latin American studies the potential beneficiaries participated actively in the Colombian (ISAGEN) cases for the various phases; whereas in the Costa Rican (ICE) cases, the role of the beneficiaries during the early phases of the programs appeared to be more limited. However, in both cases (Colombia and Costa Rica) the beneficiaries of the different intervention mechanisms participated actively in the implementation of the benefit sharing programs. The outcome of this difference in participation remains pending validation.

- Benefits derived from integrated operation of reservoirs can be paramount for the project owners and stakeholders across sectors, as in the G&L basin, LHWP and Columbia basin cases.
- Public Private partnerships (PPP) have shown to be key for success of implementation of benefit sharing mechanisms in some cases. Examples are the NT2 and Khimti HPP's. In NT2 HPP many partnerships across a range of stakeholder groups has been established. The Khimti HPP case is also significant in this aspect as it has empowered local communities to take charge of the rural electrification project, by organizing the beneficiaries into a cooperative (KREC) an entity established and owned by the users themselves prompted by the formation of a PPP.
- ISAGEN has shown to be innovative related to their cost sharing partnerships, through their co-financing approach used to contribute and enhance benefits among neighboring communities. This approach encourages interested communities to become partners in their development initiatives instead of passive receptors. In this way the local communities feel more empowered and assume much more responsibility in the projects, increasing the chances for success.
- The Angostura HPP, San Carlos HPP and NT2 HPP cases stand paramount in the innovative approach to watershed management and ecosystem protection based on the provision of funds (fees, taxes, transfers) from financial allocations by the generation companies. In these cases it is interesting to highlight that generation companies in addition to the legally required contributions engage in complementary investments for similar purposes (e.g. biophysical interventions in their watersheds).
- Related to transparency and accountability, and promotion of this, the Bujagali HPP and Nam Theun 2 HPP has shown to have a strong grievance redress system embedded in its RAP together with an open disclosure programme.
- The Columbia Basin/CBT case study stands out when looking at a very clear linkage between projects and regional development plans as HPP development, benefit sharing initiatives (environmental protection, land conservation and education programs) is an integral part of the Colombia Basin Management Plan.
- Enabling capacity building for/within institutions can be critical for the implementation success of benefit sharing mechanisms. At local level the Khimti case study through its creation of KREC is a good example. At the national level the establishment of the Benefit Sharing Council in Vietnam is another. Lastly at the transnational level the capacities of LHWC have been crucial in framing the benefit sharing mechanisms of LHWP.

 The LHWP had quite a considerable impact on the national economy of Lesotho and sparked economic development that enabled and strengthened (new) industries and services. This falls within the – Additional Economic Benefit – aspect of IHA Sustainability Assessment Protocol and scores high in the LHWP case. Similar is the case for Nam Theun 2 HPP.

# 6.4 Understanding the Impacts of Benefit Sharing

#### 6.4.1 Monitoring and Evaluation

When assessing our case studies we have found that rigorous tracking of benefits and impacts is generally not undertaken, for example through socio-economic indicators such as life quality and/or human development indexes, basic needs satisfaction statistics, access to basic public services, employment, public health etc. This is partly due to the fact that the many proponents are reactive in their responses and do not have tracking regimes in place, while in new projects (like Nam Theun 2 HPP) data is still being gathered however preliminary indicating significant benefits. Future closer studies of health and livelihood statistics may reveal additional impacts of benefit sharing. In fact the NT2 environmental and social programs involve comprehensive and continuous internal and international monitoring.

Monitoring and evaluation of specific benefit sharing mechanisms, initiatives and programs are not usually explicitly contemplated to monitor the effectiveness of the social investment. Rather they are to be found as an integral part of indicators for strategies (e.g. LHWP), CSR policies (e.g. Angostura HPP) or Environmental/Social Management Plans (e.g. San Carlos HPP). An exemption is the new Nam Theun 2 HPP where it is a stand-alone activity.

# 6.4.2 Grievance Redress Mechanisms

As has been discussed in Chapter 3.4., participatory, transparent and accountable processes are very important when implementing grievance mechanisms as part of (or onto) a project. Grievance mechanisms provide a way to reduce risk for projects, provide an effective avenue for expressing concerns and achieving remedies for communities, and promote mutually constructive relationships, thus it's at core for proper benefit sharing to be implemented. Successful implementation of grievance mechanisms has for example been found in the NT2 HPP, LHWP Phase 1B and Bujagali case studies.

6.4.3 Economic Impacts/Cost of Projects and Total Investment of Benefit Sharing Programs Related to economic impacts, cost of projects and total investments in benefit sharing programs the relationship remains unclear due to historical and/or system complexity reason (e.g. HAD, G&L basin and LHWP). Moreover this issue is often sensitive to the project owner and has been difficult to disentangle with clear figures.

However in the Colombian case, a quick review of the investment figures for 2009 showed that ISAGEN investments in social and environmental plans and initiatives are distributed as follows: 80% legally-binding commitments and 20% complementary contributions. Using the same figures (from 2009) the complementary social and environmental investments constitute roughly 1 USD per MWh.

A quick assessment of the figures for LHWP indicate a total project cost of 2.6 billion EUR (Phase 1A - 1.5 billion and Phase 1B - 1.1 billion), whereas royalties for water transfer paid

per year to Lesotho ranged between 45-47 million USD and investment in revenue fund for community development amounted 35 million USD in 2006.

Notwithstanding efforts undertaken, the team was unable to collect detailed information on the economic development impacts of benefit sharing. Besides the issue of sensitivity described above this may be due to the fact that benefit sharing is a reactive strategy for the project proponent to deal with stakeholder acceptance and is most often not a structured approach for combining the project with broader economic development opportunities and goals. *This is an important gap, given the potentially important role economic impacts could have in maximizing effective benefits, enrolling governments and leveraging project funds effectively*.

# 6.5 Highlights, Rationale and Constraints for Benefit Sharing

#### 6.5.1 Highlights and Rationale for Benefit Sharing

Benefit Sharing is a promising concept and approach for implementing hydropower and water infrastructure projects sustainably, and is emerging as a supplement to the standard requirements of compensation and mitigation.

Benefit Sharing is being driven by a societal responsibility to ensure local communities improved socio economic conditions than pre-project conditions. Core for the mechanisms to work can be policies and regulatory framework (government), corporate social responsibility policies (project proponent), and securing communities' acceptance of the project (social license to operate). With all these elements at work tripartite partnerships are more likely to become established.

Stakeholder engagement is essential in creating and designing benefit sharing initiatives, and a regulatory framework usually facilitate the design and implementation of the initiatives.

Our study supports a typology of benefit sharing mechanisms to create a balanced approach. The typology of mechanisms proposed may help deliver benefits which are balanced over time, across stakeholders and geography, especially if a portfolio approach is adopted.

The typology confirms that benefit sharing extends well beyond monetary payments through (for example); (i) extension of environment management plans beyond compensation; (ii) innovative programs of watershed management that benefits both the communities, the environment and the project proponent, and; (iii) integrated operation of reservoirs for multiple uses.

Lastly, benefit sharing can provide equity of development, sustainability and smooth project implementation for hydropower and water infrastructure development especially through proper involvement of stakeholders.

#### 6.5.2 Constraints and Hindrances for Benefit Sharing

Benefit sharing is often reactive, lacks coordination across players, and is not well embedded in an economic development context. The consequences in these cases may lead to investments (either by governments or developers) which may not fully lead to positive results, distribution may be skewed, project proponents lack a framework for limiting expenditures, while local communities may not be able to access benefits paid to higher levels of government.

The study could not find rigorous (pre- or post-) socio-economic evaluations of existing benefit sharing initiatives. This is obviously a weakness and thus advantages could be gained by planning benefit sharing initiatives in the context of local economic development goals/program, and tracking their impacts.

Lastly improper stakeholder involvement and lack of capacity building, especially for local institutions, might be a hindrance for successful implementation of benefit sharing programs. Likewise inappropriate institutional arrangements, especially related to the tripartite partnerships, can have the same effect.
## REFERENCES

ADB. 2004. Summary environmental and social impact assessment of Nam Theun 2 Hydroelectric Project.

ADB. 2009. Safeguard Policy Statement.

Ahmed T. 1999. The Role of the big Aswan Dam in Promoting the Nile River System management. Report for WCD.

Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. United Nations. 1979. Office for Outer Space Affairs. http://www.oosa.unvienna.org/oosa/SpaceLaw/moon.html

Abu-Zeid, M.A. & F.Z. Shibini. 1997. Egypt's High Aswan Dam. Water Resources Development, Vol. 13, No. 2. 209-217 pp.

Baland, J-M., and J-P. Platteau. 1996. Halting Degradation of Natural Resources: Is there a role for rural communities?, Food and Agriculture Organization of the United Nations (FAO), Clarendon Press, Oxford.

Bénabou, R. and J. Tirole. 2009. Individual and Corporate Social Responsibility, TSE Working Paper Series 09-109, Toulouse School of Economics, Toulouse, France.

Bhatia, R., M. Scatasta, R. Cestti. 2003. Study on the Multiplier Effects of Dams: Methodology Issues and Preliminary Results, Paper Prepared for the Third World Water Forum, Kyoto, March.

Biswas, A.K. 2002. Aswan Dam Revisited. The Benefits of a Much-Maligned Dam. D+C Development and Cooperation. 6. 632-639 pp.

Bujagali Energy Limited. 2010. Newsletter Quarter 1 – 2010.

Burnside International Limited. 2006. Bujagali Hydropower Project. Social and Environmental Assessment Report. Executive Summary. For Bujagali Energy Limited.

Compliance Advisor Ombudsman (CAO). 2008. A Guide to Designing and Implementing Grievasnce Mechanisms for Development Projects. Advisory Note. IFC/MIGA/WB.

Convention on the Law of the Sea. 1982. United Nations. Ocean and Law of the Sea. <u>http://www.un.org/Depts/los/index.htm</u>

Convention on Biological Diversity. 1992. http://www.cbd.int/convention/convention.shtml

Colombia Basin Management Plan. 1997.

Colombia Basin Management Plan. Charter. CBT

Colombia Basin Trust. Investing on Behalf of Colombia Basin Residents. At www.cbt.org

Colombia Basin Trust, 2008. Environmental Strategic Plan 2009-2012.

Correa E. 2010. Benefit Sharing. VS Local Sustainable Development. Providing Meaning of Benefit Sharing Into a Local Sustainable Development Framework. Draft Report, The World Bank. ID 423.

Dhillion, S. and T. Granfelt. 2010. Enhancing stakeholder participation: mainstreaming global threats and, cumulative and trans-boundary impacts. ASIA2010. E-publication. The International Journal of Hydropower and Dams. <u>www.hydropower-dams.com</u>

Duc L and N. Carrasco. 2007. Success and failure in international river management. Case Study: Lesotho Highland Water Project. Zürich.

Engineers Against Poverty (EAP). 2008. A systematic approach to project social risk & opportunity management, Briefing Note, Institution of Civil Engineers, London.

Égré, D. 2007. Benefit Sharing Issue, Compendium on Relevant Practices, Dams and Development Project, United Nations Environment Programme.

Fields D. 2006. PowerPoint presentation for WB (Hydro 2006, Greece)

Fremstad E. 1985. Flerbruksplan for vassdrag i Gudbrandsdalslågen. Botaniske undersøkelser 1. Invertering av flommarkene langs Lågen. Økoforsk Rapport 1985:3: 184 pp (In Norwegian).

GLB. 2009. Årsrapport ("Annual Report") 2008 (In Norwegian).

Grey D. and C.W. Sadoff. 2007. Sink or Swim? Water security for growth and development. Water Policy. 9. 545-575.

Haas L.J.M. 2010. Case Presentation: Law for Benefit Sharing on hydropower projects in Vietnam - & Linking national benefit sharing to Transboundary Benefit sharing. PPT file from Transboundary Cooperation Workshop, Vientiane 20-22 January 2010. MRC.

Haugum A. 1998. FoU – programmet "Etterundersøkelser". Sluttrapport. NVE – Rapport 24 – 1998.

International Energy Agency. 2000. Hydropower and the Environment: Present Context and Guidelines for Future Action, IEA Technical Report, Annex III-Volume I: Summary and Recommendations, Paris, France.

International Hydropower Association. 2004. Sustainability Guidelines.

International Hydropower Association. 2006. Sustainability Assessment Protocol.

Kitzmueller, M. 2008. Economics and Corporate Social Responsibility, EUI Working Papers ECO 2008/37, European University Institute, Department of Economics, San Domenico di Fiesole, Italy.

LHDA. 2003. Policy for Instream Flow Measures, Lesotho Highlands Water Project, Phase 1. LHDA, Kingdom of Lesotho. Second Edition, Incorporating Corrigenda.

Lillehammer L., Ulfsby Ø. And Rustad. 1999. The Environmental Assessment Process in Project Development. Statkraft SF Paper.

Lillehammer L., Kleven T., Hagen T., Bain M.B. and D. Lewis. 2010. Developing Sustainability Priorities with a Participatory Process: Lake Victoria Basin, East Africa: pp 55-66. In Beheim E., Rajwar G.S., Haigh M. and J. Krecek (eds). Integrated Watershed Management: Perspectives and Problems. Springer/Capital Publishing Company.

Loucks D.P. 2003. Managing America's rivers: Who's doing it? Int. J. River Basin Management. Vol. 1. No. 1. Pp. 21-31.

Matete M.E. 2006. Thesis. The ecological economics of inter-basin water transfers: the case of the Lesotho Highlands Water Project. University of Pretoria.

McCartney M. 2007. Decision Support Systems for Large Dam Planning and Operation in Africa. IWMI Working Paper 119.

Ministry of Natural Resources, Lesotho (Lillehammer L. ed.). 2007. Lesotho IWRM Strategy. Sweco Grøner and Delft Hydraulics. Funded by The World Bank.

Mott MacDonald. 2009. Enhancing Development Benefits to Local Communities from Hydropower Development. A Literature Review, May 2009. The World Bank.

Paiment J. 2008. Hydropower and Affected Communities: International experience with Benefit Sharing. Benefit Sharing Synthesis Report, Université du Québec en Outaouais.

Phillips D., Daoudy M., McCaffrey S., Öjendal J. and A. Turton. 2006. Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing. Regeringskanseliet, Ministry of Foreign Affairs, Sweden.

Reinhardt, F. L., R. N. Stavins and R. H. K. Vietor. 2008. "Corporate Social Responsibility Through an Economic Lens", Review of Environmental Economics and Policy, Vol. 2(2), pages 219-239.

Sadoff C.W. & D. Grey. Beyond the river. 2002. The benefits of cooperation on international rivers. Water Policy 4(5). 389-403.

Sadoff C.W. & D. Grey. 2005. Cooperation on international rivers: a continuum for securing and sharing benefits. Water International. 30 (4). 420-427.

Sadoff, C., Greiber, T., Smith, M. and Bergkamp, G. 2008. *Share – Managing water across boundaries*. Gland, Switzerland.

Scudder T. 2003. Saad el Aali – The Aswan High Dam.

Teshome W. 2009. Transboundary Water Cooperation in Africa: The Case of the Nile Basin Initiative. Review of General Management. Volume 10. Issue 2. 129-138.

Testa, M. 2008. Corporate Social Responsibility and Reputation Risk Analysis, Paper Prepared for Corporate Responsibility Research Conference 2008, Queen's University Management School/Queen's University Belfast (UK).

The World Bank. 2001. Operational Policy 4.12: Involuntary Resettlement.

The World Bank. 2005. Operational Policy 4.10: Indigenous People.

The World Bank. 2007. Implementation Completion and Results Report. Lesotho Highlands Water Project Phase 1B.

The World Bank. 2009. Enhancing Development Benefits to Local Communities in Hydropower Projects, Technical Workshop Transcript, June 26, 2008, Washington, DC.

The World Bank. 2009. Benefit Sharing and Hydropower: Enhancing Development Benefits of Hydropower Investments Through An Operational Framework: Concept Note (October 2009).

The World Bank. 2009. Directions in Hydropower.

The World Bank. 2008. Building a Sustainable Hydropower Partnership.

Qaddumi H. 2008. Practical Approaches to transboundary water benefit sharing. Working Paper 292, Overseas Development Institute, London.

UNEP. Colombia Basin Management Plan at www.unep.org/dams

UNU/IAS (United Nations University/Institute of Advanced Studies). 2003. Biodiversity Access and Benefit-Sharing Policies for Protected Areas.

WCD. 2000a. Dams and development: A new framework for decision making. London: Earthscan.

WCD 2000b. The Glomma and Laagen River Basin in Norway. WCD Case Study. Final Report, Prepared by: The Norwegian Institute for Nature Research, The Eastern Norway Research Institute and The Glommen and Laagens Brukseierforening.

Wynberg R., D. Schroeder and R. Chennells. 2009. Indigenous Peoples, Consent and Benefit Sharing. Springer, New York. Page 363.

# **APPENDIX 1 – QUESTIONAIRE GUIDELINE**

Benefit Sharing and Hydropower: Enhancing Development Benefits of Hydropower Investments Through an Operational Framework

CASE STUDY: <name> Date: XXXXXX Persons conducting interview:

# <u>General</u>

- 1. Does the company/government have a definition of benefit sharing?
- 2. Is there company/government policy or guidelines for benefit sharing?
- 3. Is there any national regulation-policy instruments or guidelines applicable directly or indirectly to the issue of benefit sharing?
- 4. If none, is there anything which is in the pipeline and which is the institution responsible for it?
- 5. Has your company had a say in the development of national instruments or guidelines for BS? (Involved in any consultation-participatory processes?)
- 6. We have a working definition of Benefit Sharing. Does the following working definition of Benefit Sharing apply to your understanding of the subject/concept? *(this ideally should be be written up on a separate paper to sharing with the interviewee)*

"A framework to maximize and distribute benefits across stakeholders, through **relevant spatial and temporal scales** by use of **various mechanisms**, and consistent with the principles of sustainability"

- 7. Do you have any suggestions or alternations to it?
- 8. Can you briefly describe the history of benefit sharing practice in your company in the government? How has the practice been influenced over time?
- 9. What is the relationship of BS and Mitigation-Enhancement Plans of an ESIA/EIA/SIA? Do you see these to be linked? How? Can you give a general example here?

10. BS can take place at a range of scales. At which scale do you think it is necessary and feasible for the company/government undertake BS processes and implement BS. Which scale is the most important in relation to your company.

Scale	Necessary	Feasible	Short or long-term	Key requirements and Limitations
Local – village level				
Local – Commune level				
Regional				
Transnational				

11. Are consultation, participation and dialogue critical for implementation of Benefit Sharing mechanisms?

If yes, why?

- 12. What role has the government (local/regional/national) played in assisting or supporting company initiatives? Where and how can this be improved to facilitate your company initiatives?
- 13. What role have stakeholders (local/regional/national) played in the development, assisting or supporting company initiatives? Where and how can this be improved to facilitate your company BS initiatives?

In the <project name> what were the main environmental and social issues?

Main Environmental Issues				
Construction Phase	Operation Phase	Mitigation	Links to BS initiatives	
Main Social Issues				
Main Social Issues Construction Phase	Operation Phase	Mitigation	Links to BS initiatives	
Main Social Issues Construction Phase	Operation Phase	Mitigation	Links to BS initiatives	

#### **Benefit Sharing Mechanisms**

Benefit Sharing - talk about mechanisms and approaches to get to mechanisms.

Monetary Non-monetary

14. Do you have any opinion / preference between Monetary & Non-Monetary Benefit Sharing mechanisms?

Which ones have worked better for your organization:

- (i) in general and
- (ii) in this case?

(Note: Elaborate based on general understanding and case background. Monetary mechanism: eg. direct payment of fees/taxes to local or national authorities/institutions; whereas Non-monetary mechanisms: eg. Support capacity building or local health infrastructure)

- 15. What would be the critical success factors for making Benefit Sharing mechanisms more operational?
- 16. Can you fill in the Table below for your specific case study identifying its various typology of mechanisms, aspects of the typology and its associated beneficiary group and social/environmental component?

Aspects of benefit sharing typology, beneficiary groups and processes

BS typology (mechanism /approach) – actual BS program implemented	Initiative Conceived by	Planned Targets and Beneficiary Groups	Intended Distribution of Benefits	Was development of BS implementation as planned or did it alter along project lifeline	What consultative process followed for determining the BS program

BS typology (mechanism /approach) – actual BS implemented	Beneficiary Group and social/environment component (scale at which BS implemented)	Process followed	Outcomes – degree of community acceptance and engagement (how measured)	Records Kept and/or if available

### Institutional, Regulatory and Policy aspects

17. In relation to this specific case what was the role of policy, regulatory and institutional frameworks (PRI frameworks) in addressing and implementing benefit sharing in your case study? Please specify and weight the importance of initiatives?

Frameworks	Relevant and Employed? Role in addressing and implementing BS	Importance
Policy instruments (State)		
Regulatory Guidelines		
Institutional		
Corporate Policy		
International Good Practice		

18. Would voluntary measures/initiatives (e.g. economic incentives) work equally well as PRI frameworks?

#### Economic aspects

- 19. Does your company have a CSR policy and strategy?
- 20. How does BS fit into the company strategy?
- 21. What is the role of BS seen as within the company or in its CSR policy?

Development? Sustainability in local/regional livelihoods? Maintaining environmental (catchment) stability? Maintaining Ecosystem Services?

- 22. What degree of public involvement/engagement does the company/government see as required for the implementation of BS?
- 23. How does your company assess the economic costs & benefits of enhancing local development through Benefit Sharing mechanisms? Is there much experience with this across projects or is it relatively new and thus still being developed?
- 24. How do the costs of implementing Benefit Sharing mechanisms affect your company's turnover?

#### Social aspects

- 25. Does the company/government have a public communication policy and strategy?
- 26. How many permanent staff are involved in the (i) public communication, (ii) BS and (iii) CSR work? Provide a list and their area qualifications/backgrounds?

To get a picture of the consultative processes that have taken place (and those that are taking place) for this HPP, the following info is needed.

Scale	If BS communication linked to (i) E&S plans, (ii) CSR, (iii) basin wide planning, and/or (iv) basin wide plans	Consultation	Participation - Dialogue	Has communication been necessary	Time line used and brief outcomes – tangible and non- tangible
Local – village level					
Local – Commune level					
Regional					
Transnational					

Specific BS mechanism and actual BS implemented	Beneficiary Group	Consultation	Participation- Dialog	What was most important outcomes and has been necessary to continue to communication?
1				
2				
3				
4				
5				
6				

## <u>M&E</u>

- 27. How do you monitor and/or measure the effectiveness of the BS measures and resources invested in Benefit Sharing initiatives?
- 28. Does your company have social performance indicators? Which ones? How are they related/associated to your Benefit Sharing initiatives?

BS Measures	Monitoring Modes/indicators of BS implementation	Measure of effectiveness economic investments in BS
BS Measures	Social Performance Indicators	Measure of sustainability of measures

29. Do the Monitoring activities mentioned above include public participation? Explain?

# **APPENDIX 2 – TOR FOR THE STUDY**

#### **Benefits Sharing and Hydropower:**

#### **Enhancing Development Benefits of Hydropower Investments**

#### **Through An Operational Framework**

#### **Terms of Reference**

October2009

#### 1. Background

After a hiatus of roughly a decade - and much debate as to its legacy and contribution to poverty and development - the World Bank is scaling up its investment in hydropower. Poverty eradication and the MDGs cannot be achieved without providing developing countries with the needed infrastructure among which hydropower is a basic component in several different parts of the developing world. Hydropower is also likely to play a key role in climate adaptation as a renewable source of energy which can contribute to the reduction of GHG and to adaptation to changes from the foreseen increase in variability in hydrology. Furthermore, from the lessons learned of the past decade or so, hydropower is increasingly recognized as providing multiple opportunities to significantly enhance community, regional and transboundary development if planned, designed and implemented in a sustainable manner.

However, it is also widely recognized that for hydropower infrastructure to effectively contribute to poverty and development, the quality of projects must be enhanced and driven by imperatives of sustainable development with a strong focus on broader development goals. Historically, one of the main criticisms towards hydropower projects - in terms of social development - is that in many cases local and regional communities are often the most adversely impacted by developed projects while benefiting the least from the projects. Foreseen macro-benefits were not necessarily trickling down to the local community level and, furthermore in many cases, the populations most affected were poor rural or vulnerable groups such as Indigenous Peoples established in remote natural resource rich areas.

The World Bank's renewed vision for hydropower is based on enhancement of the quality of economic growth and reduction of poverty while safeguarding the needs of the future generations. While a relatively substantial amount of literature has addressed the importance of safeguarding project affected people, vulnerable groups and environmentally sensitive areas from unsustainable resource development, the study of frameworks and mechanisms to enhance benefits (especially non-monetary ones) and share them equitably remains scarce and fragmented.

In 2008, the World Bank initiated deeper exploration of benefits-sharing in the hydropower sector. A framework for operationalizing benefits-sharing was drafted, a review of literature completed and two workshops hosted by the World Bank: a meeting of experts and a technical workshop for experts and project managers. The results of these activities are documented in Annexes I, II, and III. The World Bank is now extending the program to explore lessons learned and, ultimately a guidance note for project managers to help

mainstream enhancement of social and economic development benefits into the paradigm of sustainable hydropower projects.

# 2. Objectives of the assignment

The World Bank is seeking consulting assistance to:

Identify lessons learned, good practices, and key success factors and overall effectiveness (economic, social and environmental) for enhancement and sharing of benefits<sup>34</sup>, in hydropower projects through a series of case studies in different regions of the world and synthesis report.

This assignment supports the broader objective of enhancing the development benefits of water infrastructure projects, with specific focus on hydropower infrastructure.

## 3. Scope of Work

The project should be guided by the draft operational framework outlined in the project concept note (see Annex I), specifically:

- Principles
- Mechanisms
- Portfolio approach

In order to achieve the above objectives, the consultant should carry out the following activities:

- i. Define criteria of selection of potential projects for the case studies. Criteria should consider the following factors: programs that combine different mechanisms for enhancing development benefits, both successful and unsuccessful examples, and integration of the benefit sharing programs into a wide regional development approach and use of carbon funds. Final criteria will be determined in consultation with the World Bank team.
- ii. Identify potential cases to be studied and explain the reasons for listing them. Selection of the case studies will be finalized in consultation with the World Bank team.
- iii. Prepare a detailed methodology to identify, describe, analyze and assess the benefit-sharing programs using social, economic and institutional indicators, paying particular attention to non-monetary forms of enhancing benefits<sup>35</sup> and overall socioeconomic impact.
- iv. Define the operational mechanisms to conduct the case studies
- v. Prepare a work plan to carry out the studies
- vi. Prepare an inception report documenting all of the above for discussion and approval of the World Bank team.

<sup>&</sup>lt;sup>34</sup> The term 'benefits-sharing' in this document refers to a systematic effort to enhance the development benefits, particularly for local communities, as a part of an infrastructure project. It is not meant to imply any specific type or form of benefits and goes beyond sharing of financial benefits. For the purposes of this document, "benefits-sharing" will be broadly defined across the full range of possible types of benefits, and will be used interchangeably with "enhancing development benefits". <sup>35</sup> e.g. water management, institutional development (see Annex I)

- vii. Conduct at minimum of six case studies including (but may not be limited to) cases in Africa, Latin America, Asia and developed countries. Field work is required for the case study reviews. The consultant is encouraged to leverage local consultants and information sources.
- viii. Prepare individual reports of each case study according to a common structure (see Annex IV), including an executive summary for each case study
- ix. Prepare a synthesis report highlighting mechanisms applied for enhancing development benefits to local communities, institutional arrangements, results, impacts and main lessons learned, and that contains but it is not limited to the following topics:
  - o A working definition of enhancing and sharing development benefits
  - Economic assessment of enhancing benefits (within an overall development framework)
  - Social and development impacts
  - o Benefits-sharing mechanisms
  - Governance options including community participation, institutional arrangements and grievance redress mechanisms.

The focus of this work is to support the World Bank's re-engagement in hydropower resource infrastructure projects. While the choice of case studies will be restricted to that sector, the scope of research in this work will not be. Relevant programs and lessons from other sectors such as the oil, gas and extractive industries can complement individual case studies or provide examples of good practices for the toolkit.

The criteria of selection of the cases, the cases selected and the methodology to be applied should be reviewed and approved by the Bank.

## 4. Outputs

The four major outputs for Phase I will be:

- a. Inception report
- b. Series of at least six (6) global case studies, and
- c. Series of short (2-4 page) discussion notes on topics in 3(ix) above
- d. Synthesis document

The composition of the case studies is discussed in more detail in Annex IV. Preparation of the synthesis report will encompass interim discussion notes on the topics mentioned above (see (3)). The discussion notes will be used by the World Bank team to stimulate dialogue within the hydropower and social development communities and, ultimately feed back into the synthesis report.

(Note: Based on results of this assignment and subject to availability of funding, an additional task may be added to share the lessons with practitioners in the form of a guidance note. This deliverable is NOT included in the scope of work for these Terms of Reference.)

## 5. Time Frame

The proposed work program will extend over 12 months according to the following milestones:

Deliverable	After contract signing
Inception report	2 month
Case study reports	9 months
Draft global case study synthesis	11 months
Final global case study synthesis	12 months
Guidance note	TBD

In addition, a schedule of short, bimonthly progress reports will be determined.

The successful consultant will be responsible to Elena Correa, Senior Social Development Specialist, with co-team leader Daryl Fields, Senior Water-Energy Specialist. They will be joined by a multi-disciplinary team from across the World Bank, who will provide advice and support on specific components of the study.

## 6. Proposal preparation

Skills: The following skills required for this assignment are:

- o Social development
- Water resources management
- Rural development
- Development economics
- Engineering

The team should have significant experience in:

- large infrastructure projects across sectors, (including energy and water) and contexts (developed, middle income and low-income countries); and
- benefits-sharing programs.

For each team member, the proposal should identify:

- Responsibilities (relative to tasks in the work program)
- Allocation of time
- Time spent in the field (where relevant)

Consultants are free to associate with other consultants in order to form a high-quality team in which the required skills are represented. Both international and local expertise is important to the successful execution of this study. Use of local resources is highly desirable. The proposal should identify where, and to what extent, local professionals can be engaged in the study. (Note: The degree to which local resources can be used will clearly depend on the location and detailed design of the case studies which will only be determined in the first phase of the project. The proposal should identify the extent to which local resources could be accessed based on corporate experience and resources.)

**Understanding of the project:** The proposal should reflect the consultant's understanding and knowledge in the following areas:

- Policy and institutional foundations for enhancing the development benefits to communities of large infrastructure projects
- Stakeholder consultation
- Resettlement
- Institutional and local community capacity requirements and building
- Integration of water management, environmental and social factors in project design

*Methodology and work plan:* The proposal should clearly outline the methodological approach to and work plan for the project. This should include some discussion of the criteria for selecting case studies, information collection methodologies (including consultations), and an outline of the tasks required to complete the case studies.

**Procurement method:** The services described by these Terms of Reference will be procured under the World Bank's "Quality-Based Selection" method of procurement. Technical and financial proposals should be submitted at the same time, but in separate envelopes. The financial proposal should include a full budget, broken down by fees, travel and incidentals. The Budget should also indicate estimates for each of the two main outputs of the assignment (i.e., global case studies review and synthesis, and guidance note / toolkit).

**Budget:** The budget for this assignment is estimated as USD \$190,000. As per the World Bank procurement guidelines, this information is given as an indication only and consultants are free to propose their own estimates.

## 7. Proposal evaluation

Selection will be based on quality of proposal, in the context of the budget estimated noted. The criteria will be:

Corporate experience (15%)

- Hydropower in developing countries (credit for similar large infrastructure)
- Benefits-sharing (examples of programs developed)

Methodology (40%)

- Understanding of project
- Methodological approach
  - Work plan
  - Scope and approach to field work
  - o Tools/instruments (for data collection and analysis)
- Discussion of factors to consider in selecting case studies
- Approach to analyzing and comparing different benefits-sharing mechanisms (e.g., monetary versus non-monetary, including water management)

Team (45%)

- Time allocation
- Coverage of skills
  - Social development
  - Water resources management
  - o Rural development

- Development economics
- Hydropower engineering
- Experience of individual team members in each of hydropower (or similar large infrastructure) and benefits-sharing
- Use of local consultants/team members

## **Rough Outline of Case Studies**

## **Executive Summary**

- 1. Description of hydropower project
- Location, size, investment, owner/developer
- Characteristics of the project
- Timeframe during the projects was prepared and constructed. Time of operation.
- Characteristics of the area where the project is located (geographical, economic, environmental, social, political, historical, cultural)
- Affected communities and relevant stakeholders
- Main environmental issues. Main environmental impacts during construction and operation and mitigation measures
- Main social issues. Main social impacts during construction and operation and mitigation measures

## 2. Benefits-sharing program

- Approach to developing benefits-sharing program
  - How and by whom the initiative was conceived. Evolution and decision making process
  - Consultation processes in determining the program
  - Chronology
- Description of the benefit-sharing program
  - Targets (communities, institutions, government, etc.) and intended distribution of benefits
  - Types of benefits (monetary, non-monetary)
  - Mechanisms for sharing benefits
  - Benefits associated with construction and operation phases
  - Linkages with environmental and social management plans
  - Linkages with regional development plans
  - Participation and consultation process
  - Grievance redress and conflict resolution
  - Monitoring, evaluation and auditing systems
  - Expected outputs and outcomes

## 3. Institutional framework

- Institutional arrangements (roles and responsibilities)
- Government policy context and involvement, in particular linkages with broader development plans and initiatives and/or regulations (local, state, national)
- Stakeholder involvement
- Corporate social responsibility context
- Role of capacity building

## 4. Impact evaluation

• Social indicators (including distribution of benefits)

- Economic indicators
- Community acceptance and engagement
- Institutional indicators (institutional burden, corruption)
- Adaptive management

#### 5. Synthesis

- Lessons learned (institutional arrangements, mechanisms, portfolio approach, economic assessments; linkages with compensation)
- Innovations
- Transferability

# **APPENDIX 3 – THE PRINCIPLES OF SUSTAINABILITY**

#### The Principles of Sustainability

In the late 1980's the concept – sustainable development – was introduced into the environmental debate as an expression of the interdependence between the three systems identified as basic to development: E.g. the economic system, the social system, and the biophysical system. The last-mentioned frequently referred to as the environmental system.

The most common way of illustrating sustainable development is the "three spheres" diagram (see below). True sustainable development is then development that meets the "triple bottom line" where all three systems interact on an equal basis. However by using this conceptual approach most of the time, decision-makers will have to make trade-offs and otherwise try to balance the different requirements to find a solution that is the optimum one for the greater good.



Within hydropower development the principles have been central in the WCD Initiative (WCD 2000) and IHA's sustainability guidelines (2004) and assessment protocol (2006); amongst others.

# APPENDIX 4 – DETAILS OF MECHANISMS FROM SOME SELECT CASE STUDIES

#### Mitigation and resettlement plans which go beyond strictly compensation

a. In the case of San Carlos HPP in Eastern Antioquia in Colombia, it is reported that only a very limited number of families were relocated due to the construction of the HPP facilities in 1984. Therefore, a resettlement plan was not considered at that time. In spite of the above, the project promoter has engaged in several initiatives –known as complementary (social and environmental) investments – which most likely benefit the directly and indirectly affected populations in the project influence areas.

Complementary social investments aim to contribute to a wide range of social concerns among the neighbouring communities. For instance through the Community Development Program (PDC) investments are oriented towards four main areas of intervention; education, support agricultural production in local farms, health and recreation, sport and culture. During the first 10 years through the PDC, the project promoter focused investments on the following wards: Agualinda, Peñol Grande, Tinajas, Puerto Garza, La Garrucha, La Holanda, Santa Bárbara, El Charcón, Juan XXIII, Paraguas, Juanes, Pocitos and in corregimientos El Jordán and Samaná. Currently the PDC is being implemented with focus on the following wards: La Luz, Las Flores, El Cerro; Santa Isabel, La Ilusión, Las Frías, La Ciénaga, Guadualito, La Esperanza, Cañaveral, La Cabaña, El Prado, Pio XII and in corregimiento Samaná. During 2009, the PDC invested USD 68 000 in local communities around the San Carlos HPP; whereas the total PDC investments reached USD 665 000 for the five power plants in Eastern Antioquia.

In addition, as part of the Peace Initiatives program complementary social investments reached USD 460 000 out of which USD 280 000 went to the National Program for Peace and Development which acts in 23 Municipalities of Eastern Antioquia in 2010. Furthermore, as part of the Institutional Cooperation program mainly supporting San Carlos Municipality and surrounding communities, social investments reached USD 225 000 in 2010.

b. In the case of Angostura HPP in Costa Rica, more than 2000 farmers have participated in the Agroforestry and Livestock Program in the upper and middle Reventazón River Watershed. During the period 2002 - 2009 the Agroforestry and Livestock Program received total funding for USD 868 000. In addition, about 3000 participants including farmers, rural aqueducts, high schools and elementary schools, municipalities, etc. throughout the entire upper and middle watershed benefited from the investments undertaken under the Vegetative Cover Program. It includes over 2 million trees planted on farms located in areas with high risk for erosion, as well as around water sources and on the edges of rivers and streams. During the period 2002 - 2009 the Vegetative Cover Program received total funding for USD 683 000. The Environmental Education Program has achieved the participation of over 100 schools and more than 50 instructors, including over 3,000 students from the upper and middle watershed. During the period 2002 - 2009 the Environmental Education Program received total funding for USD 683 000.

- c. For the NT2 HPP in Lao PDR, the relocated population was provided with houses, electricity, water supply, schools and kindergartens, clinics and other community infrastructure, e.g. village halls. They have also been supported by the livelihood improvement programme, including irrigated agriculture, commercial forestry, reservoir fisheries and livestock husbandry. The mitigation (as part of RAP and enhancement of livelihood) went beyond assuring user rights over land, the mitigation included; (i) exclusive tenure security over houses and land for agriculture (1 plot); (ii) fishing rights in the reservoir; and (iii) rights of forest use under a 70-year concession. All three of these mitigations are considered by the proponent as extending beyond the usual requirements of mitigation. Furthermore, the desk and field studies revealed that (i) Public Health, (ii) Conservation of Public-Private Partnerships as key precursors/enablers to project implementation, particularly stood out as clear benefit sharing mechanisms, the scope of which went beyond the expected obligatory mitigation.
- d. For the Khimti 1 HPP in Nepal a huge sampler of activities has gone beyond obligatory targets for compensation thus benefiting the wider community in general. They can be summed up as follows:

Activities	Obligations	HPL development
Rural electrification	1,000 households	8,000 households
Community based hydropower plants	None	2 plants, 1 MW
Support community based RE Cooperative	None	Establishment of KREC
Microenterprise support	Generate employment	170
Toilets including Biogas	None	1,664
Drinking water systems	None	40
Irrigation systems	3	20
School support	None	36
Rural roads and trails	None	22.6 km
Training	For income generation	Over 1,800 persons
Nurseries	Establishment of nurseries	7
Tree plantation	Locals to be encouraged to plant trees	103,000 saplings

e. For the LHWP in Lesotho/RSA the WATSAN program under the EAP aimed at mitigating adverse impacts resulting from the implementation of the LHWP. The program provides water supply to affected communities. It also provides ventilated pit latrines, clean potable water, solid waste, and sullage management systems. This program has exceeded its initial targets, having provided piped water systems, 2545 VIP toilets<sup>36</sup> and other facilities to 126 villages throughout the Phase 1B project area

<sup>&</sup>lt;sup>36</sup> For Phase 1A this number equals 6369.

which had no piped water or sanitation at appraisal<sup>37</sup>. Although originally being part of the EAP and the defined mitigation measures therein, the WATSAN program clearly can be considered as an ancillary mechanism enhancing benefit to the community by going far beyond mitigating impacts only, by its focus on enhancing the livelihoods of the local communities.

## Integration of IWRM in project design

- f. In the case of San Carlos HPP in Colombia the design of the HPP completed in the mid-1980s- did not have an explicit IWRM approach. However, during the operation of the HPP the need for an integrated management of the natural resources in the watershed aroused as a necessity and became part of the environmental and social management initiatives. Particularly relevant for this issue are the complementary environmental investments undertaken by the project promoter. These investments are organized around different programs, including:
  - i. **Watershed conservation and restoration program** which includes initiatives undertaken through agreements with other institutions with interests in improving environmental conditions in the watershed which provide the water resources used at ISAGEN generation plants.
  - ii. **Conservation and sustainable use of natural resources program** which includes actions supported by the Company, either directly or through agreements with other institutions in order to conserve the natural resources in watersheds which supply ISAGEN generation centers. Under this component projects and community initiatives to promote alternative use of natural resources in the relevant watersheds can qualify for funding.
  - iii. **Basic and applied research** by leading national and regional research institutions in matters related to energy efficiency, natural resources management, and conservation of biodiversity, among others, is supported by the project promoter.
  - iv. **Environmental education and disclosure of scientific information** is undertaken by several institutions with which ISAGEN has established cooperation agreements in order to support environmental awareness and capacity building initiatives in the hydropower project influence areas. These agreements include local schools, universities and other research institutions.
  - v. **GIS and remote sensing**. ISAGEN makes strategic alliances with various entities to carry out exchanges in terms of information technology, software and knowledge. Based on these partnerships, ISAGEN periodically updates the digital maps and satellite images that allow performing analysis on the status and condition of the natural resources in the areas of influence of the generation plants.

<sup>&</sup>lt;sup>37</sup> Furthermore 101 water systems were installed in Phase 1B.

In 2009, ISAGEN invested overall (in all its 5 power facilities) around USD 450 000 in all these five (5) initiatives.

- g. In the case of Angostura HPP in Costa Rica, the concept of integrated water resource management has been the cornerstone in the creation of the river basin commission COMCURE. COMCURE provides the proper institutional framework for the design and implementation of multi-institutional initiatives in the river basin. The hydropower project owner ICE plays a key role in the operation of COMCURE, but representatives of other key sectoral institutions (water and sanitation, agriculture and livestock, land use planning, etc.) are also active members in the efforts towards the integrated management of the natural resources in the Reventazon river basin.
- h. In the case of NT2 in Lao PDR the project developed and implemented a full set of economic, environmental and social programmes to mitigate its effects on people and ecosystems, and to compensate them where necessary. These programs cover the watershed, plateau, and downstream areas, and have been designed in consultation with local villagers, under international guidelines, and with recommendations from various international financial institutions, including the World Bank. The project allocated funds for protection of watershed and protection areas. The Watershed Management and Protection Authority (WMPA) was established to fulfill these tasks. To mitigate the impacts on the Xe Bang Fai (downstream program, see www.namtheun2.com), several infrastructural and management strategies have been incorporated into the project design and have been implemented. They are; (i) a regulating pond to store power station discharge; (ii) a regulating dam restricting the rate of increase and decrease in discharge from the power station to the Xe Bang Fai; (iii) aeration structures for Nam Kathang release; (iv) a dedicated downstream channel; (v) an Aeration Weir in the Downstream channel; (vi) an erodible section of the downstream channel; (vii) the strengthening of the Xe Bang Fai confluence; (viii) partial removal of biomass from the reservoir area; and (ix) a commitment to stop power generation during period of natural flooding, to prevent additional over bank flooding. The Head Construction Contractor also had to implement specific plans for environmental management and mitigation of construction activities. The downstream benefit sharing aspects are being further developed at present after the project has started operation.
- i. Findings from the G&L basin case study in Norway show that GLB have an important role in coordinating the operation of the complex system of reservoirs on behalf of their members. It is also involved in communications with interested parties about cooperation on environmental issues and mitigation improvements so as to reduce conflict levels. The operations of the reservoirs are supposed to adapt step-by-step to the Energy Act and the system of market liberalization. Yet, the degrees of freedom are limited due to physical and legal constraints. GLB has an important role in reducing flood damage as there is a considerable flood abatement effect in optimal basin operation. Managing basin operation in an integrated fashion as undertaken by GLB ensures sustainable use of the water resources (including flood management), optimal water usage to the users, and thus helps GLB guarantee the reliability of supply to the hydropower industry in the basin. *The value of having this ability to*

regulate the water in the basin at an integrated level is estimated close to 0.7 billion NOK (GLB 2009).

j. Integration of IWRM in project design can be found at various levels for the LHWP. An example is the Watershed Management Initiative that aimed at managing and mitigate environmental impacts of the project on the watershed status. A rehabilitation and landscaping programme was initiated, where the spoil rock from the excavations works (mostly the tunnels) was deposited and compacted into erosion features then top soiled and grassed. Another effort carried out under this initiative was rehabilitation of wetlands that were adversely affected by the project implementation.

Another example is the Integrated Catchment Management (ICM) programme that is being coordinated by the LHDA. The ICM programme makes special emphasis on protection and conservation of the catchment and the water quality within the infrastructure. This programme makes use of participatory land use planning and management, with focus on range lands.

#### Ancillary investments

- k. In the case of San Carlos HPP in Colombia ancillary investments support a wide variety of local development initiatives through different collaboration agreements with relevant public and private institutions. These investments have taken place in the context of the Community Development Program, the Peace Initiative Program and the Institutional Cooperation Program. Details on the locations, areas of interventions and amounts invested in each of these programs were presented above (a. and f.).
- I. In the case of Angostura HPP in Costa Rica ancillary investments are undertaken mainly in the context of provision of equipment or infrastructure aimed at enhancing agriculture and livestock productivity and sustainable soil use through the different initiatives supported by the COMCURE. Details on these investment initiatives were presented above (b. and g.).
- m. For the NT2 in Lao PDR the provincial offset of the Project is the financial assistance and management support for the conservation of the 3,500 KM2 NNT NBCA. The Project will contribute a total of US\$ 31.5 million to the management and conservation of the NNT NBCA, contributing in this way to the conservation of internationally important biodiversity.
- n. For the Khimti 1 HPP in Nepal, ancillary investment through the project has been provided for education, irrigation, water supply and health and sanitation amongst others. However, of all the benefits of Project, the health sector benefits to the local community were most notable. The benefit was shared through provision of Khimti Project Clinic within the premise of Project office. HPL established the Khimti Project Clinic within its Project Office premise at Kirne. It has been functioning since 1993 (2050 BS). It also runs a dispensary at Palate at the intake site. Its entire annual operating cost is borne by HPL which is approximately US\$ 60,000. The Clinic is headed by a Health Assistant (HA) and has a staff of seven persons.
- o. For the LHWP ancillary investment can be exemplified by the part of the royalties reinvested in the Lesotho Fund for Community Development revenue fund and thus

allowed for the creation of job opportunities and other development projects for local communities (roads, footbridges, small dams, forestry and soil conservation works). In 2006 this amounted for 35 million USD.