

ANNEXES TO THE REPORT

of the

AFRICAN PRE-CONFERENCE

“WATER FOR FOOD AND ECOSYSTEMS: MAKE IT HAPPEN!”

ANNEX D

Cases Presented at the Conference

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Annex D. Cases presented at the pre-conference

CASE 1: PARC NATIONAL DU DIAWLING

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I INTRODUCTION

La zone d'étude se situe dans le bas delta du fleuve Sénégal en rive droite entre 16°35'00''N, 16°20'00'' O et 16°05'00N et 16° 30'00'' O. Des aménagements hydrauliques réalisés sur le fleuve et certains de ses affluents ont fondamentalement modifié le caractère du fleuve Sénégal et de la zone d'étude. La construction du barrage anti-sel de Diama, situé à 27km de la ville de Saint-Louis (Sénégal) et achevé fin 1985, a réduit de façon considérable la zone estuarienne. Les endiguements sur la rive droite ont partagé l'ancienne plaine d'inondation en une zone qui est en permanence sous l'eau et une zone qui ne peut être alimentée en eau qu'à travers des ouvrages hydrauliques

Malgré les transformations de l'hydro système deltaïque en aval du barrage de Diama, une quantité importante d'eau douce est disponible depuis la construction de ce barrage. Deux grandes conceptions de l'utilisation de ces eaux existent : ces eaux peuvent être utilisées à des fins agricoles pour l'irrigation de périmètres rizicoles ou utilisées à des fins de restauration du milieu naturel offrant la possibilité de développement intégré.

Entamée depuis 1993, la restauration de l'écosystème de la plaine d'inondation du Parc National Diawling à travers le Programme Zones Humides de l'UICN financé par DGIS, montre comment les systèmes de production de ruraux pauvres peuvent dépendre excessivement des fonctions et services des écosystèmes naturels. Du fait des liens inextricables entre les écosystèmes et les systèmes des moyens de subsistance des communautés rurales, la restauration de la plaine d'inondation a engendré à la fois la renaissance des fonctions biologiques des écosystèmes et la reprise spectaculaire des activités traditionnelles de production: pêche, élevage, artisanat, etc. Ceci démontre que la disponibilité de l'eau pour la restauration des écosystèmes naturels ou pour la réduction de la pauvreté n'est pas toujours une œuvre vaine. Dans le cas de la plaine d'inondation du Diawling, il a été observé que les besoins en eau pour l'écosystème naturel et les exigences en eau pour la production agricole et la génération de revenus sont largement concomitants. Sur la base de cette convergence d'intérêts entre les communautés locales et les écosystèmes naturels, un partenariat vital peut se tisser pour la promotion de l'utilisation durable de l'eau à travers une concertation de l'ensemble des usagers.

II LE PROGRAMME OMVS

Dès sa création au début des années 1970, l'OMVS (l'Organisation pour la Mise en Valeur du Fleuve Sénégal) a mis en place un vaste programme pour faire face à la sécheresse chronique qui frappait ses états membres: Mali, Mauritanie et Sénégal.

Ainsi, le bassin du fleuve Sénégal a été équipé de grands barrages, voués à modifier de façon importante son régime hydrologique. Celui de Diama, implanté très près de l'embouchure et mis en service en 1986, est destiné à empêcher l'intrusion de la langue salée marine, et permet en outre de rehausser le niveau du fleuve, favorisant ainsi la mise en valeur de 375.000ha de terres cultivables. Celui de Manantali, construit sur la rivière Bafing qui fournit environ la moitié des volumes d'eau transitant dans le fleuve a été mis en service en 1987. Avec sa capacité de stockage équivalent à

environ une année d'écoulement moyen de la rivière Bafing (12 milliards de mètres cubes), le barrage de Manantali affecte l'ensemble du cours du fleuve de Manantali à Diama. Ce barrage a pour objectifs de générer 800 GWh d'énergie hydroélectrique par an et de régulariser les débits du fleuve Sénégal.

En outre, ces deux barrages devraient garantir la navigabilité du fleuve sur un tronçon de 800 km de long.

III IMPACTS DU BARRAGE DE DIAMA SUR LES ECOSYSTEMES DU BAS DELTA

Au début des années 60, le bas delta était alternativement inondé par les eaux salées marines et par les eaux douces de la crue du fleuve (Baillargeat, 1964). Cette alternance des eaux douces et salées favorisait le développement de mangroves à *Avicennia germinans* et à *Rhizophora racemosa* dans la zone estuarienne (Adam, 1965). Les pâturages de qualité (*Echinochloa colona*), les herbacées pérennes telles que *Sporobolus robustus* et les peuplements d'*Acacia nilotica* étaient abondants dans la zone inondable. Ce milieu saumâtre était une zone de frayère pour les poissons et les crevettes (Reizer, 1971) et un important lieu de nidification d'oiseaux piscivores tels que les cormorans, les hérons, les aigrettes et les spatules (Naurois, 1969).

La construction du barrage de Diama et des digues de retenue d'eau dans les années quatre vingt a modifié le régime des crues naturelles du bas delta. Par ailleurs, ce barrage est resté quasiment fermé de 1985 à 1994. De ce fait et en l'absence de lâchers d'eau douce, les eaux de l'estuaire du N°Thiallakh situé dans sa partie aval, ont pu devenir hyper salines et les anciennes plaines inondables ont eu tendance à évoluer en sebkhas (Hamerlynck, 1996). Les ressources halieutiques ont fortement diminué tandis que la végétation estuarienne a quasiment disparu (Diawara, 1997).

Aussi, le poids hydrostatique du barrage a provoqué la remontée de la nappe phréatique dont les eaux d'origine lagunaire ont compromis le développement de la végétation caractéristique de certains biotopes du bas delta.

Néanmoins, dans le contexte de l'après barrage une importante quantité d'eau douce est disponible au niveau de la retenue de Diama. Mais le caractère stagnant de ces eaux a provoqué la prolifération de mauvaises herbes aquatiques (*Typha australis*, *Salvinia molesta*, *Jussiaea repens*, etc.) occasionnant ainsi une perte de biodiversité et une baisse de la production de poissons et de crevettes, notamment. En effet, ces plantes envahissent tous les plans d'eau libre et obstruent les voies de migration de l'ichtyofaune.

Ces perturbations du milieu naturel ont eu un impact d'autant plus négatif sur les économies villageoises (basées essentiellement sur l'exploitation des ressources naturelles) qu'elles interviennent après une période de péjoration climatique qui a décimé les troupeaux bovins et compromis l'agriculture pluviale (Duvail, 1996).

En effet, à partir des années 80, les effets conjugués de la sécheresse et la construction du barrage de Diama ont occasionné des migrations importantes de la population vers Nouakchott et Nouadhibou. Le système économique n'était plus autosuffisant mais au contraire fortement dépendant d'activités extérieures au bas delta.

IV RESTAURATION DES ECOSYSTEMES DU BAS DELTA

En 1980, une étude d'impact environnemental des barrages de Diama et Manantali financée par l'USAID recommande la création d'un estuaire artificiel dans la partie mauritanienne du bas delta afin d'atténuer les effets négatifs qu'allait occasionner ces deux barrages sur le fleuve Sénégal.

Conformément à cette recommandation, le Parc National du Diawling a été créé en 1991 en rive droite du bas delta du fleuve Sénégal avec une superficie de 16 000 ha en vue de constituer une même unité

écologique transfrontière avec le Parc National des Oiseaux du Djoudj avec lequel il n'est séparé que par le fleuve.

Cette initiative a rapidement obtenu le soutien de l'UICN qui, à travers le financement de la DGIS, a souscrit à l'idée de restauration d'anciennes plaines d'inondation. Deux objectifs complémentaires avaient sous-tendu la création de cette aire protégée. Il s'agissait des objectifs suivants :

La restauration et la conservation des ressources naturelles d'un écosystème du bas delta tout en rétablissant autant que possible le cycle de l'inondation saisonnière de la zone humide avant la sécheresse et avant le barrage.

La lutte contre la pauvreté à travers des actions de développement en faveur de la population et ce, dans une optique de durabilité

La restauration des zones humides devait se faire à travers la construction et/ou la gestion améliorée d'infrastructures hydrauliques avec une gestion de l'eau qui tient compte des besoins de tous les acteurs (pêcheurs, éleveurs et cueilleurs de produits divers)

4.1 L'approche

L'approche utilisée consistait à:

- Capitaliser les connaissances locales, en particulier sur l'hydrologie de la zone avant le barrage et de ses dimensions écologiques et socio-économiques ;
- Mener des investigations scientifiques avec de larges consultations avec les parties prenantes concernées: pêcheurs, communautés engagées dans la cueillette des produits de la forêt, éleveurs, etc.
- Mettre en place des digues et des ouvrages hydrauliques d'alimentation et de vidange tout en tenant compte des recommandations de l'étude des impacts environnementaux menées par Gannett et Flaming,
- Elaborer un plan de gestion consensuel (1993-1996)
- Mettre en œuvre ce plan de gestion (1997-2000)

Le plan de gestion ainsi élaboré et mis en œuvre tournait autour de deux grands axes : un axe « restauration et conservation des valeurs écologiques antérieures du bas delta » et un axe « développement des activités traditionnelles et de nouvelles activités génératrices de revenus compatibles avec l'axe restauration conservation ». Les objectifs assignés à ce plan de gestion étaient les suivants :

- Le rétablissement du fonctionnement hydrologique de la zone ;
- La restauration de la végétation caractéristique ;
- La restauration du potentiel halieutique de la zone ;
- La restauration des valeurs ornithologiques du bas delta ;
- L'optimisation de la gestion du Parc ;
- Le renforcement des activités traditionnelles compatibles avec la restauration des écosystèmes
- Le développement de nouvelles activités génératrices de revenus compatibles avec la conservation des écosystèmes restaurés
- L'amélioration de la qualité de vie des collectivités locales.
- La réalisation de l'ensemble de ces objectifs est étroitement dépendante de la maîtrise de l'eau.

4.2 Les résultats

Les résultats de restauration sont obtenus au bout de 12 ans répartis en quatre phases. Les trois premières ont été exécutées par l’UICN à travers des fonds du gouvernement du Royaume des Pays Bas. Durant la quatrième, le Fonds Français pour l’Environnement Mondial a accompagné le processus de restauration en finançant des activités liées à la protection de la biodiversité.

La première crue artificielle a eu lieu 1994 et a permis de mettre en eau les deux principaux bassins du Parc (Bell et Diawling). Les ouvrages hydrauliques de vidange ont facilité les échanges entre les bassins du Parc et l’estuaire du N’Thiallakh. Les eaux de crue ont inondé tous les bassins de la zone y compris la lagune de Chat TBoul et les marais de Toumbos situés beaucoup plus au nord. Les espèces estuariennes de poissons fréquentent à nouveau les bassins de Bell et de Diawling longtemps mis en sec.

Une carte de la végétation établie à cette date relève la présence de 153 espèces végétales dont 128 espèces herbacées et 25 espèces ligneuses. La plupart de ces espèces végétales joue un rôle dans le développement de l’artisanat et dans l’alimentation du bétail. La régénération de la végétation caractéristique du bas delta à travers les crues artificielles a vite relancé la pratique de certaines activités traditionnelles dont, notamment, la confection des nattes à partir des tiges de *Sporobolus robustus*, graminée pérenne inféodée au milieu estuarien et le tannage des peaux avec les gousses de *Acacia nilotica*. La zone reconquiert sa vocation pastorale et de nouveaux troupeaux viennent y paître.

Le suivi de la présence saisonnière de l’ichtyofaune dans les différents biotopes du parc et de sa zone périphérique effectué sur quatre ans (1994 à 1997) révèle une fréquentation des différents sites par 87 espèces dont 47 espèces d’eau douce et 40 espèces estuariennes et marines. Longtemps privés de poissons, les pêcheurs s’installent au niveau des ouvrages hydrauliques et pratiquent leur métier d’antan. Les captures qui étaient faibles pendant les premières années deviennent de plus en plus importantes et attirent plus d’hommes actifs. La pêche dans l’estuaire fixe les pêcheurs dans leur terroir et marque la fin de l’exode vers les grands centres urbains. De jeunes écoliers abandonnent leurs études et se reconvertissent en pêcheurs.

Les dénombrements d’oiseaux d’eau migrateurs démontrent le caractère international du site. Plusieurs espèces recensées présentent des effectifs qui dépassent le critère de zone humide d’importance internationale fixés par la convention du même nom (Ramsar, Iran 1971). De nos jours près de 187 espèces d’oiseaux sont recensées dans la zone dont 97 espèces d’oiseaux d’eau migrateurs afro tropicaux et du paléarctique occidental, 8 espèces de rapace et 56 espèces de passereaux. Parmi ces dernières il y a 20 espèces migratrices du paléarctique.

Tableau 1: Hauteur de l’inondation, volume des captures de poissons et nombre d’oiseaux aquatiques sur la rive droite du delta du Fleuve Sénégal

Année	Ampleur maximale de l’inondation	Captures de Poissons (kg)	Oiseaux aquatiques (unités comptées)
1992	-	<1000	2216
1993	-	<1000	5292
1994	15020	10000	66100
1995	16240	15000	32300
1996	10100	10800	14400
1997	20320	25500	40900
1998	27050	74500	35098
1999	29890	113800	38413
2000	32390	Pas de données	Pas de données

Source: Hamerlynck et autres, 2003.

La restauration a aussi marqué le retour de la faune terrestre dans la zone. Des observations effectuées par le personnel du Parc révèlent la présence 11 espèces de reptiles dont, entre autre, le crocodile du Nil, le Varan et le python de Séba. Au niveau des mammifères on compte 17 espèces largement dominées par les phacochères et les chacals.

Une étude d'évaluation économique du Parc National du Diawling réalisée par l'UICN au mois de mai 2004 a fourni un bilan concernant une année d'exploitation du Parc (2002). Ce bilan qui prend en compte la valeur économique de l'apport global des activités d'une part, et de l'ensemble des investissements publics et privés liés au Parc, d'autre part, fait ressortir une valeur ajoutée d'un montant d'environ 217 millions d'ouguiyas de soit environ 700.000 dollars US. La valeur ajoutée par hectare est de 18 118 UM soit environ 65 \$US. En guise de comparaison, l'étude menée par WWF sur la meta-évaluation des valeurs économiques des zones humides estime la valeur moyenne pour ce type de zones à 145 \$US par hectare et par an.

Les principales activités économiques des populations de la zone sont : la pêche, l'artisanat, la cueillette, l'élevage, le maraîchage et le commerce. Les activités de pêche, d'artisanat et de maraîchage sont souvent exercées en tant qu'activités principales. Quant à la cueillette, à l'élevage et au commerce, elles sont souvent exercées comme activités secondaires. Le commerce est cependant pratiqué par plus d'un cinquième (21%) des populations.

La pêche occupe environ 26% des chefs de ménages. Quant au maraîchage, il constitue la principale source de revenu pour 21% des habitants de la zone. L'artisanat occupe un cinquième des habitants, constitué essentiellement de femmes. Cette activité trouve ces intrants grâce à 1 % d'habitants faisant de la cueillette leur principale occupation. L'élevage constitue quant à lui l'occupation principale de 11% des habitants. Il faut cependant noter que les artisans s'adonnent, dans leur majorité, à la cueillette, que presque toutes les familles possèdent un petit élevage de case et qu'une importante majorité des commerçants a un revenu principal différent du commerce (UICN, 2004).

Tableau2: Valeur ajoutée globale (2002)

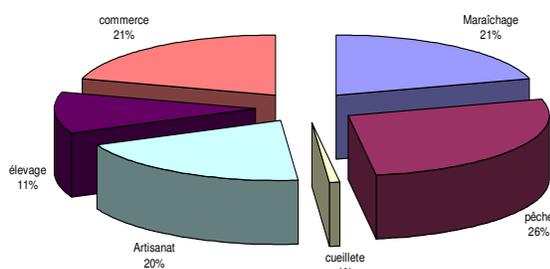
Les résultats et valeurs engendrés par le Parc		327 344 004
Résultats commerciaux des activités	173 419 924	53%
Taxe de péage touristes	2 106 400	
résultat pêche	97 739 691	
résultat maraîchage	60 105 310	
Résultat cueillette et artisanat	12 747 859	
Résultat élevage	720 663	
Valuers non commerciales	93 572 426	29%
autoconso et don pêche	23 249 167	
autoconso et dons maraîchage	30 243 259	
autoconso et dons cueillette et artisanat	0	
résultat économique élevage	40 080 000	
Investissements	46 351 654	14%
Investissements Etat et bailleurs	28 351 654	
Investissement privé	18 000 000	
Coûts évités	14 000 000	4%
coûts évités de l'assistance alimentaire	14 000 000	
Les charges globales par le Parc		109 929 426
Charges liées à l'activité du parc	109 929 426	
charges de fonctionnement du Parc	109 929 426	
Résultat global du parc		217 414 577

Source étude évaluation économique UICN, 2004

L'analyse de ces résultats montre qu'un déséquilibre écologique du parc peut entraîner la quasi disparition de cette importante valeur ajoutée dont 82% sont engendrés directement par des activités économiques totalement dépendantes de la conservation du parc. Cette analyse montre aussi que la valeur ajoutée obtenue au cours de l'année 2002 constitue 18% de l'effort de financement consenti par l'Etat et ses partenaires sur 6 ans.

Ces arguments sont des preuves tangibles de l'intérêt que revêt le Parc National du Diawling pour l'économie nationale.

Répartition des populations par activité



Source étude évaluation économique UICN, 2004

5 LEÇONS APPRISSES

Un fleuve coulant librement a souvent des avantages qui lui sont liés et c'est une erreur d'estimer les coûts afférents à la modification du flot naturel d'un fleuve comme étant nuls. En fait, en comparant et équilibrant les impacts totaux (positifs et négatifs) du Programme de l'OMVS sur la rive droite du delta du fleuve Sénégal, il est difficile de déterminer si les communautés locales ont réellement tiré profit de l'entreprise ou si elles ont été les grands perdants. Dans tous les cas, il semble évident que les avantages du fleuve coulant librement ont été négligés.

Dans les contextes de données disponibles limitées, comme c'est souvent le cas en Afrique (données sur l'hydrologie ou les réponses des écosystèmes aux tendances d'inondation variantes), les connaissances des communautés locales peut être une excellente source d'informations pour déterminer de manière empirique les besoins en eau des écosystèmes. En conséquence, le manque de données hydrologiques ne doit pas servir d'excuse pour ne pas mettre en place et exécuter des 'flots environnementaux'.

La restauration des écosystèmes est un effort à long terme et la matérialisation des avantages socio-économiques y afférents requiert du temps. Dans ce contexte, le combat contre la pauvreté par le biais de la gestion des écosystèmes est un défi réel: les pauvres ont souvent besoin de solutions à court terme à leurs besoins de survie. L'UICN s'est consacrée à ce défi à travers la promotion d'activités génératrices de revenus (horticulture, emploi dans des activités de projet tels que les travaux de construction de bureaux de projet et de berges, etc....) pendant la restauration de l'écosystème du Diawling.

Les besoins des écosystèmes sont souvent synchronisés avec ceux des communautés pauvres dont les moyens de subsistance sont largement dépendants des activités liées à l'inondation telles que la pêche, la cueillette des produits sauvages, l'élevage, etc. Sur cette base, des opportunités existent pour la mise en place d'une coalition entre les défenseurs de l'environnement et les communautés locales.

VI CONCLUSION

Le Parc National du Diawling est une zone humide essentielle pour le développement durable et la conservation de la biodiversité en Mauritanie.

L'eau, à travers un système contrôlé inondation et exondation favorise la restauration des écosystèmes et remet les ressources naturelles à la disposition des communautés locales qui en tirent leurs principales sources de revenus.

L'expérience menée au PND depuis un peu plus d'une décennie donne un exemple sur l'impérieuse nécessité d'impliquer les populations locales dans la gestion des ressources naturelles de leur terroir et le rôle éminent joué par l'exploitation de ces ressources dans la lutte contre la pauvreté.

En effet, même si les populations locales avaient été réticentes voire hostiles à l'idée de création d'une aire protégée au bas delta, celles-ci se sont vite ressaisies au vu des résultats spectaculaires de la restauration et ont demandé que les limites du Parc soient étendues afin de leur permettre d'augmenter leur main mise sur les ressources naturelles en ce que le Parc attire des personnes venant des régions voisines. C'est pourquoi le processus de création d'une réserve de biosphère transfrontière du bas delta du fleuve Sénégal, actuellement en cours, a trouvé un écho favorable au niveau de l'ensemble des communautés de la zone.

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**CASE 2: *RESPONDING TO DOWNSTREAM ECOLOGICAL AND SOCIAL
IMPACTS DUE TO PHASE I OF THE LESOTHO HIGHLANDS
WATER PROJECT (LHWP)***

Obed M. Letsela, Thabang C. Tsehlo

1. PROPOSED STATEMENT

In response to the Lesotho Highlands Development Authority's (LHDA) In-stream Flow Requirements (IFR) study identified potential impacts, the LHWP Authorities put in place a policy and management strategy, to mitigate the ecological impacts through water release schedules from the dams and associated structures, in the right quantities, quality and frequencies appropriate to meet downstream riverine ecosystems, and to compensate for the resulting socio-economic resource losses.

2. ABSTRACT

The Lesotho Highlands Water Project (LHWP) is a bi-national inter-basin water transfer scheme established by a 1986 Treaty between Lesotho and South Africa, for Augmentation of the Vaal River basin water supply to Gauteng, the industrial heartland of South Africa; and for hydropower generation in Lesotho. The Treaty stipulated environmental and social obligations for mitigation of project-caused impacts; which included ecological and social impacts due to regulated flows of downstream rivers. In response to these downstream impacts, the LHDA (the Project implementing statutory body) instituted In-stream Flow Requirements (IFR) studies, which identified potential impacts, as a result of which an IFR Policy and management strategy was developed. The Policy and management strategy are guided by principles and practices that ensure the ecological needs are met, through the right quantities, quality and frequency of water releases from the dam structures, as well as putting in place communal compensation through development programs, to offset permanent loss of livelihood resources. Adaptive management, supported by regular monitoring, is the adopted strategy to reduce levels of uncertainties associated with effects of flow modifications as revealed by the studies.

3. BRIEF DESCRIPTION OF THE CONTEXT

The purpose of the In-stream Flow Requirements (IFR) policy of the LHDA is to provide for management of flow releases for maintenance of riverine ecosystems downstream of LHWP Phase 1 impoundments. It will also provide for the mitigation of, and compensation for, flow related impacts on resources, ecosystems and other losses of indirect nature.

To achieve this, the policy provides for the following procedures:

- Dam operational principles, methodology and settings put in place to determine, and provide for annual variations in bulk IFR, to mimic fluctuations in catchment annual run-off as well as provide the required monthly IFR maintenance flow releases;
- Monitoring rivers below LHWP dams to assess the efficacy of the recommended IFR allocations, and to verify that compensation to affected communities is timely and effective.

The adaptive management system is the driver of the policy and procedures to ensure that overall IFR Policy objectives are met. Annual Evaluation and Review of the process is allowed for, including Audit to be performed at five-year intervals. Mechanisms for public involvement are part of the adaptive management system in implementing the IFR Policy, for continued consultation with the

affected communities, and to pass relevant information. This also includes wider annual stakeholder conferences inclusive of NGOs and other interested and affected parties.

4. PRIMARY ISSUES THAT ARE BEING ADDRESSED

Environmental and social welfare considerations are stipulated requirements of the LHWP Treaty, and these were given effect through the LHWP Phase 1 Environmental Action Plan drawn on the basis of the detailed environmental studies (for Phase 1A), and Environmental Impact Assessment of the project (for Phase 1B). Although the Treaty was written at a time when the overriding concern was upstream impacts, the Treaty stipulated requirements compel the LHDA to account for all areas and communities affected by the Project, which includes modified river flow impacts on the ecosystems and the resultant resource losses to the downstream communities.

5. THE LHWP INNOVATIVE APPROACH IN RESPONDING TO DOWNSTREAM ECOLOGICAL AND SOCIAL IMPACTS

LHWP is a bi-national inter-basin water transfer scheme birthed by the 1986 Treaty between Lesotho and South Africa, for water transfer from the highlands of Lesotho to the water thirsty industrial powerhouse of Gauteng, South Africa, and in the process provide hydroelectric self-sufficiency for Lesotho.

Environmental and social pre-requisites for mitigation and compensation of impacts arising from the scheme's implementation, operation and management, were embedded in the Treaty, although at the time the focus was mainly on upstream impacts. Article 7(18) of the LHWP Treaty states: "The Parties agree to take all reasonable measures to ensure that the implementation, operation and maintenance of the Project are compatible with the protection of the existing quality of the environment and, in particular, shall pay due regard to the maintenance of the welfare of persons and communities immediately affected by the Project."

The IFR studies, which included a level of community consultation to assess socio-economic consequences to affected communities, were undertaken with the assistance of IFR Consultants under the employ of LHDA, the statutory implementing body of the Project. These studies were undertaken to investigate and identify biophysical and social impacts of regulated flows downstream of LHWP dams. The studies revealed complexities associated with the downstream riverine systems, and this together with the multi-lateral loan obligations for the Project necessitated formulation of a clear statement of intent and commitment by the Project authorities for implementation of an IFR management system for downstream impacted areas (LHWP IFR Policy 2nd Edition 2002).

The IFR studies were undertaken from 1998 to 2002, to identify ecological impacts and hence estimate potential resource losses to communities as a result of reduced flows, and estimation of the economic replacement values thereto (based on the resource buying power). The prominent resource losses contributing to the social impacts of the population at risk (PAR) were identified as fish, wild vegetables and woody material, and public and animal health effects (LHWP Contract LHDA 678 – Biophysical and Social Consequences).

To assist in the selection of the optimum bulk IFR, three modified flow regimes were hypothesized in addition to the Treaty flow regime, based on the design of the LHWP structures and the amount of water they could release downstream. IFR sites downstream of impoundments were selected for assessment of the biophysical impacts for each of the IFR scenarios. The sites, in combination with "Reference Sites", were selected to provide representative effects of flow alterations over the IFR reaches, from where the socio-economic impacts for the PAR were assessed.

The consultants utilized a new methodology, DRIFT in the assessment of the IFR. DRIFT was first devised and applied for the LHWP IFR studies in predicting biophysical impacts and the associated resource losses due to downstream flow modification, for the four different flow regimes, in each river

reach. DRIFT stands for *Downstream Response to Imposed Flow Transformations* (LHWP Contract LHDA 678 – Biophysical Consequences). A full description of the IFR studies, including the socio-economic studies, and the resultant Project Economic studies to review economic impacts on the Project due to increased downstream flows, can be accessed in the LHWP libraries in Lesotho and South Africa.

The IFR Policy and management procedures were developed on the basis of the estimated potential impacts revealed by the studies. The approved IFR policy became operational in December 2002 immediately after impoundment of the Phase 1B Mohale Dam (LHWP Phase 1 IFR Policy 2nd Edition, July 2002).

The scope of the LHWP IFR Policy has been defined as follows:

- It addresses the release of water from LHWP Phase 1 dams to meet ecosystem and socio-economic requirements in the downstream river reaches;
- It addresses mitigation of impacts and compensation for resource losses that can be directly linked to changes to flow patterns in rivers downstream of LHWP structures;
- Although the Policy took effect from December 2002, the compensation will be based on calculations that take account of differing impoundment dates of the LHWP structures, and will be delivered indefinitely.
- The IFR policy will be subject to annual reviews by independent experts, and an independent audit will be done once every five years; however, the initial bulk IFR allocation will not change within the 3 years of the policy coming into effect;
- The primary PAR is located within a corridor about 10 km wide, with the river as its center line and the lesser of the 5km on either side of the river reach and the watershed divisions as its outer boundaries, with allowance given for consideration of genuine claims outside this space.

The LHWP IFR Policy is guided by the following key principles and criteria:

- To fulfill the legal obligations of the Treaty - to maintain and where feasible improve the welfare of Project affected people (PAR), and to protect the quality of the environment as far as is practically and reasonably feasible.
- Optimization of water releases to meet environmental criteria and community user requirements – by implementing dam settings to allow for intra-annual bulk IFR volumes and monthly base flows.
- Due to uncertainties of effects of flow modifications on river ecosystem behavior, adaptive management is the driver of the Policy implementation, through which progressive levels of uncertainty will be reduced through regular monitoring and assessment of actual conditions as compared with expected and desired conditions.
- The ecological management of the downstream rivers affected by LHWP shall be undertaken in relation to the river condition classification developed by LHDA. The aim is to target the highest river condition class feasible, and to prevent degradation of affected rivers to status beyond the “moderately modified” state; and to avoid river transformation, degrading and modification by more than two states from its baseline state.
- The IFR adaptive management process, above, shall guide provision for mitigation, through flow release adjustments and compensation by payment for resource losses, in accordance with approved procedures.
- Participatory and transparent management with the communities shall be employed, and due emphasis shall be placed on the affected communities involvement, welfare and safety; and they will be kept aware of possible effects of dam operations.
- When Phase 1 storage system cannot meet all allocations, the order of priority in allocations shall be IFR releases, transfer water delivery and hydropower generation.
- When water yield in the Phase 1 storage system exceeds all initial allocations, the surplus water will be allocated first to increase the IFR requirements for the next succeeding hydrological year, as allowed for in the dam operation procedures; and second for water transfer and hydropower.

- The estimated potential resource losses, as identified by the IFR studies, shall form the basis for the mitigation and compensation replacement values. Mitigation and compensation for the downstream communities will be applied differentially consistent with the differing levels of impact, as the IFR studies predicted impacts will be greatest and immediate in nature, for the communities residing in reaches that are proximal to the impoundments; less apparent and less predictable for the downstream distal reaches.
- The Project authorities have recognized, from the studies, that there will be losses of non-direct use values – the intangibles, such as cultural impacts associated with the Project, and have provided for a review of such losses in order to consider possible offset programs and other options.

6. THE MAIN CONCLUSION THE CASE HAS TO OFFER

The LHWP has brought immense economic benefit to the peoples of both countries. In addition, LHWP authorities are fulfilling their obligation in recognizing need for protection of ecological integrity downstream of the LHWP Phase 1 impoundments, through development and implementation of the IFR Policy and management system to provide appropriate quantity, quality and timing of water releases to meet the riverine and social needs in reaches downstream of the dams. In the face of uncertainties of regulated flow impacts on the ecosystem, the adaptive management process is found to be an effective tool to meet the IFR objectives.

The IFR Policy development and implementation procedures have not been without challenges. The first being that, given the uncertainties of resource impacts in the downstream river reaches, the socio-economic monitoring in the reaches below the impoundments will have to be undertaken on the basis of a monitoring protocol with socio-economic indicators that will help distinguish project-related effects on public welfare from broader Lesotho trends; and track effectiveness of the compensation program, as well as assess whether Treaty commitments for the downstream are broadly being met. The socio-economic monitoring will be undertaken only once the socio-economic indicators have been developed, through a pilot study involving the affected downstream communities. This process is yet to be finalized.

Another major challenge came when procedures for IFR flood releases needed to be established downstream of Katse Dam, the first major and larger of the Phase 1 dams. Unlike Mohale, which has multiple outlets for the IFR flood releases, flood releases from Katse will only be possible through the low-level emergency outlets, with capacity to release from the largest class “within-year floods” to 1:20 year floods. However, flood releases from low-level outlets will result in water quality impacts on the downstream aquatic systems, especially the effects of temperature shocks which were evident during low-level release tests undertaken to date. The effects are most pronounced in the proximal reaches.

The IFR Policy and management strategy (the Procedures) development involved public participation that included the PAR and the interested organizations such as the International Rivers Network (IRN) and the World Bank who financed the Project. By implementing the IFR policy, the LHWP recognizes the multi-sectoral nature of water resources development regarding the socio-economic development and the inherent multi-interest use of water resources for inter-basin water transfer, local supply and sanitation, agriculture, hydropower generation, fisheries, recreation and maintenance of Lesotho’s river ecosystems.

The implementation of the LHWP IFR policy supports the spirit of the World Water Forums in promoting sustainable water management policies in Lesotho. The Ministerial Declaration at The Hague Second World Water Forum, for example, on the Integrated Water Resources Management – planning and management of water resources.

The integrated approach adopted in the IFR responses is in line with the other key international commitment, the Johannesburg Plan of Implementation and the “Water Energy Health Agriculture and Biodiversity (WEHAB) initiative” from the World Summit on Sustainable Development. In addition,

compensation programmes include the potential for community initiated development programs such as rural water supply and sanitation services which contributes to the Millenium Development Goals of halving by the year 2015, the proportion of people without access to safe drinking water as well as halving, by the year 2015, the proportion of people who do not have access to basic sanitation. Lastly, dams are necessary for development (WCD 2000). The World Commission on Dams went further by elaborating on one of its recommended strategic priorities thus: “Large dams provide for releasing flows to help maintain downstream ecosystem integrity and community livelihoods and are designed, modified and operated accordingly”.

CASE 3: THE NILE BASIN INITIATIVE (NBI) "FROM VISION TO ACTION"

Musa Mohammed Abseno, Coordinator, National NBI Office, Ethiopia

PROPOSED STATEMENT

Nile Basin Initiative (NBI) - "To achieve sustainable socio-economic development through the equitable utilization of and benefit from, the Common Nile Basin Water Resources"

ABSTRACT

Formally launched in February 1999 by the Council of Ministers of Water affairs of the Nile Basin States, the Initiative includes all Nile Countries and provides an agreed basin-wide framework to fight poverty and promote socio-economic development in the region. The Nile countries seek to realize their Shared Vision through a strategic Action Program, comprising basin wide projects as well as sub-basin investment projects.

BRIEF DESCRIPTION OF THE CONTEXT

The Nile is the world's longest river. It flows more than 6600 kilometres, draining an area of about 3.1 million square kilometres. The Nile systems originate from the Ethiopian plateau, the Equatorial lakes and Bahrel Gazal. The annual flow of the Nile at Aswan varies from 150 BCM in high year to 42 BCM in dry year. There is a significant irrigation development in the lower part of the Basin while there is no utilization of the water in other parts of the basin.

The range of ecosystems within the Nile Basin rivals that of any other river basin in the world, with high mountains, tropical forests, wood lands, savannas, high and low altitude wetlands, arid lands and deserts as well as enormous delta partially below sea level. Tropical rainforests are found along the divide of the Nile and Congo rivers, in Lake Victoria Basin and in Southwestern Ethiopia.

The Nile Basin is characterized by poverty, rapid population growth and environmental degradation. Most of the basin countries are among the poorest with per capita incomes between 100 - 200 USD.

THE INNOVATIVE APPROACH / GOOD PRACTICE DEVELOPED

The projects envisaged under the NBI are envisaged and planned at regional level with the involvement of the countries and are implemented at sub-regional and national level.

The NBI is a transitional arrangement pending the establishment of a new and permanent legal and institutional Framework. The Nile Countries are heavily engaged in a negotiation on the issue. Accordingly, a Negotiation Committee for the Nile Basin Cooperative Framework (D3) is working on a draft agreement that will bring a new institution.

A crosscutting programme known as Confidence Building and Stakeholders Involvement has been designed to address multi-stakeholder process.

The Shared Vision Programme has also designed a project known as Efficient Water Use for Agriculture. The objective of the project is to provide a sound conceptual and practical basis to increase the availability and efficient use of water for agricultural production.

The Trans-boundary Environmental Action Project is one of the Shared Vision Programme Projects that will deal among other things with Wetland and Biodiversity Conservation.

The Shared Vision Program has also includes Water Resources Planning and Management Project with 3 major components one of which is Decision Support System (DSS).Its objective is to develop and support informed decision making from a regional perspective by providing a common platform for communication, the exchange of information, and water resources analysis.

CONCLUSIONS / LESSONS

Obstacles that need to be addressed:

- Lack of sufficient finance for the realization of projects- A number of partners have pledged support and provided money to the NBI. However, there is still a gap in covering the implementation of some of the projects and scaling up some of the activities, particularly, those to be implemented at subsidiary level. There are also some delays due to procedural matters;
- Efficient mechanism for stakeholder's involvement- there is a need for urgent implementation of strategies developed by the NBI for the proper involvement of stakeholders in each project. The current forum of Nile Discourse lacks proper linkages with the process of the NBI;
- Proper linkage with other similar initiatives to exchange and share experience. There are numerous initiatives such as NEPAD, AMCOW, etc. that may help in bolstering the NBI. They can use the NBI, which is a functioning mechanism for the implementation of their planned activities.

Ways of internalising lessons learned:

- Conduct proper public information- The Confidence Building & Stakeholders involvement project has to e implemented;
- Strengthen confidence building measures among the countries of the Basin –In-country dialogue has to continue to bring about a permanent framework for cooperation.

SUCSESSES

Sense of ownership - The NBI is owned and managed by the riparian countries themselves. Riparian ownership of the NBI is manifested in its structure the implementation mechanism. The institutional arrangement is based on a decentralized approach to bring in the sense of ownership at the least appropriate level. The process is lead by the Council of Ministers (Nile- COM) and their Technical Advisory Committee (Nile- TAC). There are regional Project Management Units (PMUs) dispersed through most of the Basin countries to address the issue of equity and fairness in riparian ownership. the project implementation is facilitated by the National NBI Offices established through the out the basin countries for the SVP projects and National Focal Points for the SAPs. This implementation arrangement aims not to overburden the NBI structures with un necessary administrative and procedural functions and to allow themto focus unhindered on the strategic guidance and daily management of the projects. In addition the NBI has a lean and mean administrative arm the Nile Secretariat (Nile-SEC) at basin level and ENTRO and NEL-CU at sub-basin level.

Partnership - the partnership between the Nile Basin countries and the international community has been established through the International Consortium for Cooperation on the Nile (ICCON). There is a close working relationship with the development partners through the establishment of the Nile Basin Trust Fund (NBTF) in the World Bank to administer the NBI fund until the countries are able to strengthen their capacity to do so. The NBTF committee comprising the countries and donors has been established to oversee the activities of the fund.

DILEMMAS TO BE OVERCOME

Permanent legal and institutional framework needs to be put in place-the NBI is a transitional arrangement pending the establishment of a permanent legal and institutional framework. Negotiations on drafting a framework agreement are under process. There is a need to expedite the process so that a permanent framework of the basin could be realised.

Work hard for a flow of investment- the need for investment in the basin is of paramount importance. Therefore, investment opportunities have clearly to be identified and a mechanism as to be developed as to attract finance and investment for the development of the basin's potential resources.

Strengthen the level of confidence among the NB Countries- There is a better confidence and degree of trust among the Nile Basin Countries since the establishment of the NBI. However, this confidence has to be strengthened through activities beyond the river such as economic, cultural, political etc. integration.

Strengthen stakeholder's involvement in the process- the stakeholder's involvement is as essential part of the cooperative process. Therefore, mechanisms that have been designed in the Shared Vision Programmes and Subsidiary Action Programmes need to be activated to keep in the stakeholders in the loop.

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CASE 4a : INTERGRATED WATER RESOURCES MANAGEMENT IN THE RUFUJI BASIN IN TANZANIA

Willie Mwaruvanda, Rufiji Basin Water Office (RBWO); presented by L. Kongola, Tanzania¹

PROPOSED STATEMENT

- The integrated water resources management principles have started to be implemented in Tanzania. Due to many competing water uses in the Rufiji Basin, 'it has been necessary to start to apply the principles soon after the National Water Policy was in place in July 2002. Some of the issues like the concept of value of water have been applied in Tanzania since 1994. The participation of stakeholders in the water resources management is being practiced at all levels through existing and new institutions as an implementation of good governance and has proved to be quite useful in water allocation, conservation and protection aspects.
- IWRM can be affected by catalysts like donors and some well wishers. It requires political will to be able to introduce new philosophies to communities with various other ideologies.
- Water resources management issues are directly connected to livelihoods.
- The social values are quite important in dealing with problems tied to problems of the utilization of water and other natural resources in the Rufiji Basin.

ABSTRACT

The integrated approach in water resources as presented in the National Water Policy addresses participatory, multi-sectoral, multidisciplinary river-basin management, which, recognizes that water is a scarce resource and integrates the linkage between land use and water use and recognizes the important role water ecosystems play in the national economy.

Basically, the new approach reflects three major shifts:

- i) *Comprehensiveness*: A holistic basin approach for integrating multi-sector and multi-objective planning and management that minimizes the effects of externalities, and ensures sustainability and protection of the resource;
- ii) *Subsidiarity*: Decentralizing decision making and devolving to the lowest practicable level, with stakeholders participating in the planning, design, implementation of the management actions and decision making; and
- iii) *Economic*: Decision-making in the public sector, private sector and in civil society on the use of water should reflect the scarcity value of water, water pricing, cost sharing, and other incentives for promoting the rational use of water.

The Rufiji Basin Water Office has been practicing these principles for a time now with the assistance of several programs namely, River Basin Management and Smallholder Irrigation Project and Ruaha Water Programme sponsored by WWF.

BRIEF DESCRIPTION OF THE CONTEXT

- The Rufiji Basin covers an area of 177420 square kilometres (about 20% of Tanzania). The river

¹ **Partners:** River Basin Management and Small Irrigation Improvement Project (Ministry of Water and Livestock Development and Ministry of Agriculture and Food Security) and World Wide Fund For Nature (WWF) (Tanzania Programme Office) under the Ruaha Water Programme.

drains into the Indian Ocean. It is situated between Longitudes 33°55'E and 39°25'E and between Latitudes 5°35'S and 10°45'S. The altitude of the basin rises from 0 at the Indian Ocean to above 3000 meters above mean sea level (mamsl) in the highlands (Kipengere ranges and Poroto Mountains).

- The basin extends from Indian Ocean inland about 640 km its width varies from a minimum of about 55 km in the lower parts to about 480 km in the portion above Iringa.
- The basin is characterised by many wetlands both in the highlands and the lowlands. The major wetlands are the Utengule in the Great Ruaha and the Kibasila in the Kilombero. The mangrove at the Rufiji river delta, are also a special type of vegetation in the Basin
- In 1967 it was estimated that there were about 1,000,000 living in the whole basin. The 2002 census results indicate that about 1,400,000 people live in the basin now.
- Water uses include domestic, irrigation, hydropower, livestock, industrial, fishing, environment and navigation purposes.
- There are many conflicts arising from the many competing water uses
- The Great Ruaha River sub-basin is the one that has been heavily impacted by the use of water and environmental degradation. The paper will mostly deal with this sub-basin.
- In order to monitor water resources in the basin, over 50 hydrometric and water quality and 12 hydro-meteorological Stations are established and operating. 14 hydro-geological monitoring stations are also being established in the basin.

Description of the Rufiji Basin

The Rufiji Basin is made up of the three principal sub-basins. The principal sub-basins are composed of numerous river systems. The Rufiji River can have maximum flows of up to 14,000 m³/sec and minimum flows of about 50 m³/sec in the lower catchment. The Great Ruaha although covering about 47% of the drainage area contributes only about 15% of the runoff of the whole system. The Kilombero Sub-basin contributes about 62% of the flow while Luwegu contributes about 18% of the flow. Flows in the basin bare a wide range of variation (between the low flow and high flow periods). The largest part of the basin experiences longer dry seasons and shorter wet seasons. It has been observed that of the total annual flow about 65% to 80% passes in the wet season at any one given point (5-5 1/2 months).

Table 1: The Four major rivers in the Rufiji Basin

No	sub-basin	catchment area	% of drainage area	% of annual runoff
1	Great Ruaha	83,979	47	15
2	Kitombero	39,990	23	62
3	Luwegu	26,300	15	18
4	Rufiji	27,160	15	5
	Total	177,429	100	100

In the Great Ruaha Sub Catchment most of the water is extracted for irrigated agriculture. Irrigation is used to supplement rainfall during the wet season in the upper catchments and is applied in the dry season in the lower parts of the catchment and on the higher areas of the sub-basin, Other uses for which water is extracted include domestic and hydropower generation purposes. Fishing is largely in-streams.

Table 2: Water allocation in the Great Ruaha River

Water Use Type	Annual use in m ³
Domestic	28,939,621
Irrigation	3,159,014,017
Hydropower	5,804,141,407
Industrial	539,544
Livestock	2,828,837
Total	8,995,463,426

There are several conflicts in the basin especially in the Great Ruaha. Conflicts include the following aspects of competing water use:

- Irrigation to hydropower
- Irrigation to livestock
- Upstream irrigation schemes to downstream ones
- Irrigation to environmental water requirements especially the Ruaha National Park
- In-stream fishing to both irrigation and environment

It has been shown that environmental requirements have been affected by dry season irrigation water use. There also exists minor non-point water pollution caused mainly by agricultural activities in the Great Ruaha.

Table 3: The proportions of amount of water allocation requirements for various uses

Water Use	Percentage of use
Domestic	0.20
Irrigation	27.47
Hydropower	72.29
Industrial (Sugar, Cane, tea)	0,01
Livestock	0.04
Aquatic Ecosystem	0.16
National Park	0.39
Total	100.00

The National Water Policy states that there shall be a criteria for prioritisation of water allocations so as to ensure that socio-economic activities and the environment receive their adequate share of the water resources on the basis of its availability, and to enable the sectors increase productivity, and to mitigate conflicts. The new Water Law shall take this into consideration.

The National Water Policy recognises an institution framework that includes the water users at grass root level to the National Level. There shall be Water User Associations and groups, sub-catchment and catchment committees, districts, basin and National Level. Some Water User Associations have been established as follows:

Table 4: Some Apex Water User Entities

Name of Association	Catchment	Main water uses
Mapogoro, Mfumbi Resource Management Association (MAMREMA)	Kimani River	Irrigation, livestock, domestic
Halali Water User Association	Halali River	Irrigation, domestic and livestock
Mkoji Catchment Management Association	Mkoji River	Dry and wet season irrigation. Domestic and livestock
Chimala Water User Association	Chimala River	Irrigation
Mpando River Water User Association	Mpando River	Valley Bottom cultivation. Domestic. Dry season irrigation.
Mtitu Water User Association (being established now)	Mtitu River (tributary of the Little Ruaha River)	Dry season irrigation, valley bottom cultivation, domestic and mini-hydropower
Ndembera Water User Association (just started the process)	Ndembera River	Irrigation and domestic

There are over 60 smaller and single use groups. The Districts and some villages in the Great Ruaha Subbasin formed environmental Committees which essentially deal with environmental and catchment conservation and protection in their respective areas.. Most people are poor and live in rural areas.

There are few urban or sub-urban areas in the Rufiji Basin. With an exception of the urban dwellers the people in the Great Ruaha catchment depend on Agriculture and livestock keeping for their living and economy. There are a few minor mining activities in both the Great Ruaha and Kilombero subbasins. Fishing is mostly done in the Mtera reservoir, in the wetlands and in-stream.

The stakeholders in the Great Ruaha sub-basin and the Rufiji as a whole are mainly, Central Governments Ministries (departments), Local Government (Regional, District and Village levels), Non Governmental Organisations, Community based organisations., Parastatal organisations, traders, non formal groups (fishermen, farmers, hunters etc) and Water User Associations.

In areas where these associations are established, WWF through her Ruaha Water Programme is capacitating them by providing some working tools like transport facilities (motor cycles and



bicycles), establishing credit facilities called Community Conservation Banks and education on conservation and water management. The education is also conducted to various other groups including village government officials, other local Government officials and stakeholders in general.

PRIMARY ISSUES AND PROBLEMS

- Over extraction of water during the dry season in the Usungu (100% of the flow). Irrigation efficiencies in individual schemes are generally low. Because of this the Great Ruaha has been virtually drying up every year since 1994 for stretch of about 80 kilometres. The Population growth in the Great Ruaha sub-basin is generally high (about 2.9%). There is a good market for rice (especially the varieties grown here). The off-season crop normally fetches more money, thus encouraging rice irrigation to be almost all year round instead of supplementing rainfall. Wetlands in the Great Ruaha River are being used for livestock grazing thus degrading them completely;
- There are no proper land-use plans in the sub-basin as for now;
- There is expansion of areas under irrigated agriculture due to increased population and migration of livestock keepers, improved market opportunities force rice cultivation to increase by an extent of which is threatening other land uses, degradation of land and other natural resource, water

pollution due to application of excessive agro-chemicals and removal of certain ecosystem virtue (like what is happening to valley bottom cultivation in wetlands and along streams).

THE PRACTICES IN THE BASIN

- There are efforts of establishing Water User Associations as described above. There are various types of these, like irrigators associations, water user groups (for domestic water supply), livestock keeper associations, cooperative societies and catchment wise entities.
- We have two forums dealing with water and natural resources management namely:
 - The Water Managers Committee deals with the planning of water management for irrigation in the upper catchment of the Great Ruaha River. It is composed of management of large irrigated schemes, smallholder schemes, local government officials. Central Government officials (three Districts in two Regions) and Rufiji Basin Water Office
 - Usangu Planning Group (The Great Ruaha Catchment Committee) which is an advisory committee to start with. It composed of Government officials (from Ministries, Regions and Districts, Non Governmental Organisations, Farmers, representative of Traders, Water User Associations at catchment level, Livestock keepers, major water users like the Tanzania Electric Supply Company (TANESCO), other stakeholders like The Tanzania National Parks Authority (TANAPA)
- The Rufiji Basin Water Board (RBWB) is established which according to the National Water Law is appointed by the Minister Responsible for Water Affairs: This was established in 1993 and has 10 members. The Board is the overseer of all water management issues in the basin. The Boards deal with water allocation and water pollution control. The Rufiji Basin Water Office is the implementing agency of the Board. It deals with enforcement of the Water Law.
- The basin has many wetlands the largest of which is the Kibasila in the Kilombero Sub-basin. The upper portion of the Great Ruaha has the Utengule swamp important for the downstream ecosystem including the Ruaha National Park. These wetlands are a habitat for various types of flora and fauna. Both have been utilised for livestock keeping. The Kibasila has been declared the Ramsar Convention Site. Part of the Utengule swamp including the permanent part, the 'lhefu', has been designated as a Game Reserve.
- As is now evident, balancing the water demands between development activities and biodiversity requirements is a difficult issue we are dealing with in the basin.

CONCLUSIONS

The integrated water resources management in the Rufiji Basin takes into consideration the various competing water uses. The active participation of stakeholders have resulted into:

- Establishment of water user entities;
- Minimisation of Conflicts;
- The working relationships between water managers and communities have been strengthened
- The vision of restoring flows in the drying part of the Great Ruaha River is becoming real every day;
- Involving stakeholders with various interests can be time consuming and expensive but quite rewarding;
- The issues of integrated water resources management in the Great Ruaha Subbasin are by themselves integrating factors. Both food security and biodiversity concerns are obvious in the basin.

CASE 4b: SUPPORTING TRADITIONAL INSTITUTIONS IN MANAGING RIVER BASED RESOURCES: THE CASE OF PASTORALIST BORANS ALONG EWASO NGIRO RIVER—KENYA

Daoud Tari Abkula, Co-ordinator, Friends of Nomads International (FONI)²

INTRODUCTION

Pastoralists especially in the Horn of Africa are at crossroad. They are trapped in constant calamity of famine and conflict that is fuelled by the underlying marginalisation of the Pastoral production system. There is nothing much you can do in the dry grassland of Africa, other than raising livestock that has adapted to that condition over the years. Again and again it has been proven beyond reasonable doubt that pastoralism is economically viable and a rational way of utilising Africa's Rangeland.

It is against this background that FONI (Friends of Nomads International) a Kenyan based NGO Started to work among the Boran Pastoralist Living along the river Ewaso Ngiro. FONI worked on the issues of conflict over water between the BORANS and their neighbouring Pastoralists. We also worked on issues of supporting the local DEDHA Institutions that they BORANS have been using to manage their affairs. Our work covered the entire Pastoralist who lives on both banks of the River. This work led us to engage with many other actors who are stakeholders in the River Ewaso. This included Government Institutions that are either regulatory bodies or Development agents, Other Communities who live in the middle and upper part of the River system. We have formed community river based water association that can engage with the River authority and other stakeholders. The revitalised traditional institutions have also taken full responsibility in managing CHAFFA resources. It has also been able to sort out conflict both externally and within the Community. Most important it is now playing very significant role in engaging external development actors.

CONTEXT AND THE ISSUES

Just as the Nile is to Egypt the River Ewaso Ngiro is the lifeline around which everything depended for the Boran Pastoralists of Isiolo District in Kenya, hence their name as BORAN WASO (the Boran of Ewaso).

The River springs from Mount Kenya and Aberdares Mountains in Central part of the Country transacting the entire District territory of about 300km. Towards the end at lower land the River turns into a flood plain that forms a Wetland called CHAFFA. The Wetland is a critical resources that has been sustaining the Pastoral Production in this area. It acts as drought reservoir during the times of shortage of rain by providing both pasture and water to pastoralist. In the normal times Chaffa Pasture is preserved but the river water is used by livestock and Humans being.

Over the years the River Water has been constantly reducing to the extent that the River is no longer permanent Water source. The reduced River water has also impacted negatively on the Wetland (CHAFFA) on which the Pastoralist depends during times of Drought and Famine. The reasons for this depletion of the riverine resources are:

- Increased use of water by the commercial ranchers who live upstream of the river.
- Increased use of the water by the international flower farmers, who export the produce to Europe.
- Establishment of irrigation agriculture in the upper, middle and even the Lower part of the river system in total disregard of pastoralists living down stream.
- Establishment of industries in the upper part that use vast amounts of river water.
- Huge increase in population that lives along the river system especially the upper part and is engaged in agriculture, thereby putting pressure on water demand in the river.

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The above are the primary reasons for the dwindling river resources. Another critical element that has aggravated the situation is the erosion of the traditional pastoral management systems. It is also true that all the activities that are contributing to this state of affairs are seen in the National level as being of importance to the Nation Development priorities.

CONSEQUENCES FOR THE PASTORALISTS

The consequences of these developments have had a very negative impact to the overall livelihood of the pastoralists. It has resulted in the following:

- a. Increased and unregulated upstream use of the river has resulted in no river at all in three months in a year for the Pastoralist living downstream.
- b. Total depletion of the Chaffa and other ecological biodiversity that has been sustaining life in the area.
- c. The reduced resources have resulted in conflict with external people and produced tension internally within the community.
- d. It has hugely contributed to loss of livestock especially during the dry season, thus undermining the economic base of the region.
- e. It has contributed to aggravating poverty and shattering livelihood in the area.
- f. Having reduced some pastoralists to destitutions; it has also made them dependent on external agencies for their livelihood support during the times of want.

SUCSESSES AND STRATEGIES

FONI, working closely with the community, government agencies, NGOS, River Development Authority and other partners, facilitated a multiple process to address these issues. Events, community meetings and several workshops were organised for the stakeholders. The following were the achievements realised:

- The traditional dedha council used by the BORANS to manage resources in now a vibrant and revitalised institution managing not only the chaffa but engaged in all aspects of community affairs.
- There is a well defined internal rules and mechanism of water use governed by the ABBA HIREGA. There is also clear rules of engagement with other external Pastoralist. This has reduced incidences of conflict which have engulfed the area before.
- The formation of the Ewaso Water Users Association from both sides of the River bank has given the Community a legitimate organ with which to engage other stakeholders.
- A collaborative effort between FONI and Ewaso River Development Authority has given these issues a high profile and that now the parastatal is in the process of undertaking development programmes in the area.
- The issue of equitable water use of the river Waso has taken a national dimension. It has been raised in the National Parliament and by a speaker of the Kenya National Assembly.

OBSTACLES AND THE FUTURE

The major obstacle has been the harsh reality of covering a vast area that is hardly developed in terms of infrastructure of all types. It calls for a lot of sacrifice especially if one does not come from the Pastoral background. A lot of lead time was also spent in lobbying key stakeholders and important community leaders to embark on this Programme, a fact which was not factored in the initial stage. The authorities at first were suspicious and their support was not coming as fast but after it was clear to them what the intent of the initiative is then they were at the forefront in giving us their support. This is true for those authorities that are based at local level. We found out that there was a very lax, ineffective river catchment board that cannot enforce its decision. The same is also true for the Water Apportionment Board and the River Authority. They all lack capacity to enforce their statutory duties in enforcing their legal obligation.

The upper stream users of the river are either huge commercial ranchers or flower farmers who export their produce to European markets.

Those farmers are powerful and well entrenched with the governing elite and therefore it requires a well organised advocacy activity to put them on notice that their activities is illegal and that it is either curtailed or something else be done to use the river equitably.

There is serious lack of technical knowledge of the river itself and how various interest groups use it for their advantage. A well-informed argument will definitely strengthen your position for you are advancing your point from informed position. Thus a research that will look at existing legal framework and institutional arrangements that govern the River is needed. Based on these findings, then a comprehensive advocacy program should be initiated. This now should move a scale up and target the powerful upstream users of the water.

The challenges to this programme are many but we are inspired by the marginalisation of the pastoralist and will do our utmost to see that this imbalance is redressed.

We also wish to thank all our partners in this endeavour including Both Ends, Action Aid, Ewaso Ngiro Development Authority and the Waso BORAN Community of Isiolo District of Kenya.

CASE 5: THE RESTORATION OF THE WAZA LOGONE FLOODPLAIN IN CAMEROON: LAKE CHAD BASIN CASE STUDY PRESENTATION

Paul Noupa³, IUCN-ROCA, paul.noupa@iucn.org; and partners

PROPOSED STATEMENT

If the ecosystem approach had been used as the guiding principle for the 1970s dam planning process, all stakeholders would have been partners resulting in both a commercial rice scheme as well as viable downstream resources.

ABSTRACT

The Waza-Logone area comprises 800,000 hectares in the Extreme-North province of Cameroon, between 10°50' and 12°10' North latitude within the Lake Chad basin. It contains a vast flood plain known as the *yaéré* which is an important wetland in this part of the country and two National Parks, Waza and Kalamaloue. The area is predominantly rural, despite the existence of some important country towns. The population is primarily involved in agriculture, fishing, trading and cattle owners. The population growth rate and nomadic pastoralists and fishermen, contribute to increasing pressures on the area during dry season.

The construction of the Maga dam and its embankments in 1979, and the drought in the 1980s have reduced the extent of flooding over the flood plain, and resulted in a drastic reduction in fishing activities and livestock rearing. A large number of people left the area, and wildlife numbers also fell because of the lack of dry-season grazing and surface water. Other consequences have been the over-exploitation of the fisheries and the grazing, and the migration of many animals outside the parks during the dry season, then increasing susceptibility to poaching.

To offset the negative impacts of the Maga Dam, the Waza Logone project has been initiated in the 1990s. The hydrological condition of the wetland has been improved by the opening of two seasonal watercourses connecting the Logone River to the Logomatya River, from whence significant flows spread onto the floodplain. Furthermore, the project has facilitated a number of steps in the process of involving local and indigenous communities in wetland management. The traditional chiefs, administrative and municipal authorities and provincial heads of technical services sit on a regional committee, the Committee for Management of the Waza Logone Region while other stakeholders are being put together in management structures on lower levels by the project to remain in charge of the management of natural resources.

The cost-benefit analysis for the project indicates that the benefits of the project's measures greatly outweigh its cost. Direct benefits are obtained from increased pasture for cattle holders, more fish in the streams, more river transport and use of herbs. Furthermore, the restoration of the floodplains yielded indirect benefits for instance through the growth of fish stock, increased production opportunities for fish and crops and providing an environment that support the growth of wildlife and bird populations. Finally, also optional and *abd cyktyrak* benefits were obtained. An estimate of the costs and benefits shows that net benefits before the dam construction in 1979 amounted to an annual 11.0 millions euros, were reduced to 8.4 millions euros during the 1980s, while after the Waza Logone Project intervention, they have been restored to an even higher level than before 1979, i.e.

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11,8 millions euros. Studies show that further restoration of floods, from the current 20% to 50, 71 or 90% of their original levels would yield even greater net benefits, up to 24.7 million euros per year.

Future steps in improving the conditions in Waza Logone area would require:

1. Integrated approach, across both disciplines and interests
2. Scientific information for sound decision making, from economic, hydrologic and social perspectives
3. Creation and strengthening capacities for decision making and management both within state government, organisations as well as among local communities and local institutions.
4. Addressing short-term, medium-term and Long –term needs simultaneously.

BRIEF DESCRIPTION OF THE CONTEXT

The Logone River in Cameroon is typical of many rivers in Africa. In the dry season, it may almost cease to flow, whereas during the wet season (August-September), with an average flow rate of 1,800 m³/sec, it may overflow its banks. Before the 1980s, when seasonal floods were unimpeded by engineering works, a vast area on the left bank, encompassing a substantial part of Waza National Park, was temporally flooded most years. Fishers, farmers and nomadic pastoralists used the floodplain, following the annual flood pattern in a well-established sequence which allowed all users to benefit from the inundated land before, during, and after the wet season. Thousands of elephants and giraffes, and a huge population of antelopes, roamed the floodplain in and around Waza National Park, providing a significant source of tourism-related income for local people and the government. However, the past 30-40 years has seen a rapid increase in the population of people and livestock in the Sahel. Given the demographic changes and the climatic variability, hydrological management has been seen as the key to development through the implementation of major river engineering schemes. Many dams have been built in the Sahel for irrigation and hydropower production. In the late 1970s, the 30 km long Maga Dam was built to create a 400-km² reservoir (Lake Maga) needed for a series of rice projects (SEMRY 1 and SEMRY 2). Objectives were to reduce food imports and increase rural household incomes. This dam and the many kilometres of embankments on the left bank of the Logone River deprived the Waza Logone floodplain of much of its natural flood water and, therefore, of its ecological potential. From 1981 until the mid-1990s, this sharp reduction in flooding led to major environmental degradation and severe social upheaval over an area covering 800,000 hectares downstream of Lake Maga.

PRIMARY ISSUES ARISING FROM THE DAM CONSTRUCTION

The dramatic changes in flooding had a serious impact on the many people who relied on the natural resources for their livelihoods. Income dropped due to smaller fish catches, reduced arable land available for floating rice or sorghum growing and for flood recession farming, and also because fuel wood, fruits, medicines and tradable products such as Arabic gum, were less plentiful. Dry season grazing lands for cattle and wildlife were also greatly reduced. Thus, the sudden and nearly total alteration of the water regime over several tens of thousands of hectares of floodplain had an immediate impact on ecosystem functions and services, resulting in large-scale emigration of local people, cattle and wildlife to other areas.

THE PROJECT

Studies carried out under the aegis of the Waza Logone Project (managed by IUCN, through an agreement with the Government of Cameroon⁴) clearly demonstrated how a period of dry years, aggravated by the presence of the Maga dam, had deteriorated the functioning of the floodplain

⁴ Funding is provided principally by the Directorate-General for International Cooperation (DGIS) of the Netherlands, while additional grants and in-kind support were also received from the World Wide Fund for Nature (WWF), the European Commission and the Government of Cameroon. The Netherlands Development Organisation (SNV), the Centre for Environment and Development Studies in Cameroon (CEDC) and the Institute of Environmental Sciences (CML) from the University of Leiden, the Netherlands, provided scientific and technical support. The project was also supported by SEMRY, the provincial, local and traditional authorities.

ecosystem. This in turn had a negative impact on the local economy. These negative consequences provided the justification to undertake large-scale hydrological restoration of the floodplain that would mitigate the adverse effects of the dam on the ecosystem. The project consulted all concerned parties on the need and the extent of an undertaking to restore flooding. The stakeholders that were identified by the project were the local communities, the local, regional and provincial government, the Lake Chad Basin Commission (LCBC) and SEMRY, the parastatal organisation who was the operator of the rice scheme.

The project executed a cost-benefit analysis taking into consideration flood-related benefits and costs and direct physical costs of flood release measures. It calculated the net incremental benefits and costs of different re-inundation options, as compared to the existing situation of reduced floods. Benefits and costs were expressed as net values - the costs of labour and other inputs used to generate products had been excluded. This presented a more accurate assessment of the economic value of benefits and costs, made them more directly comparable, and helped to avoid the problem of double counting - especially where value is simultaneously or consecutively added to the same floodplain good or service by different groups. Pilot flood release areas were included in additional flooded areas. Costs and benefits were analysed over a period of 25 years at a base discount rate of 10%, representing the opportunity cost of capital in Cameroon.

The economic benefit of re-inundation was calculated as well. The total economic benefit of wetland resources is conventionally defined as the sum of their direct values, indirect values, option values and non-use values. Direct values are composed of the raw materials and physical products that are used directly for production, consumption and sale. Indirect values are the ecological functions that maintain and protect natural and human systems through its functions and services. Option values are the premium placed on maintaining a pool of wetlands species and genetic resources for future possible uses. Non-use values or existence values are the intrinsic value of wetland areas and species, regardless of their current or future use. The economic value of flooding in the Waza Logone region before the construction of the Maga dam in 1979 refers to the original flooded area. The table below synthesises the benefit per speculation in the region. This results show that before dam construction, the net total benefit of the floodplain was about €11,000. With the construction of Maga Dam, this benefit decreased to some €8,000 to increase as high as €12,000 with the re-inundation of the area through Waza Logone Project intervention.

	Value before 1979 (€*1000)	New value after Dam Construction (€*1000)	Incremental Value of re- inundation (€*1000)
Pasture	6075,1	4672,6	6366,3
Fisheris	3425,6	2927,1	3650,3
Agriculture	705,9	365,9	857,7
Grass	779	474,1	973,2
Surface Water supply	21,4	1,6	30,1
Bee Keeping			0,9
Net Benefit	11007	8441,3	11878,5

The hydrological and ecological rehabilitation of the Waza Logone floodplain, through re-inundation, is an important element of the Waza Logone project. To date the project has already accomplished two pilot flood releases, which have led to demonstrable recoveries in floodplain flora and fauna. The local people welcomed the pilot flood releases, because they profited from the increased productivity of the floodplain.

A number of different release options had been worked out by the project. It was intended that further restoration of the previously inundated area would be achieved by constructing engineering works that allow flood releases from Lake Maga and its associated water courses. The implementation of any of these options requires a considerable financial input. A study was therefore carried out to estimate the economic returns of additional floodplain re-inundation to justify investments in flood release measures in order to safeguard the hydrological, ecological, biodiversity and socio-economic benefits

of the Waza Logone floodplain. This implied that only those benefits were valued that were believed to be sustainable. Studies show that the cost benefit production per speculation will increase.

Calculation for the implementation of different options of the project was estimated as follow:

	Costs of the project (€ * 1000) for 5 years	Incremental benefit of re-inundation (€ * 1000/year)
Option X (90%)	8,200 à 10,000	2,475
Option Y (71%)	7,700 à 9,300	1,901
Option Z (50%)	6,000 à 7,100	1,227

So to restore flood scheme of the region in a 5 years programme, it will take € 6 to 7 millions for option Z (50% restoration) to produce € 1,227* 1000/year of incremental net benefit to the economy of the region. And these figures change to € 8,2 to 10 millions to produce € 2,475* 1000/year of incremental net benefit to the economy of the region in option X that is 90% of flood restoration.

THE INNOVATIVE APPROACH

The project used the ecosystem approach as the guiding principle for establishing participatory planning and management procedures, carrying out numerous environmental, social and economic studies, as well as for training and communication activities.

The use of a Cost-Benefit analysis in the context of new economy, i.e. taking into account not only direct costs but also flood-related benefits and costs of economic activities that at the same time are benefiting ecological functions of the flood plain.

CONCLUSIONS

Flooding provides a vital source of support to the fragile ecology and economy of the Waza Logone region. The high and wide ranging economic costs associated with flood reduction that had been felt seriously eroded rural livelihoods and the regional economy. These are costs that neither the Government of Cameroon, nor the local population, can afford to bear over the long-term.

The overall conclusion of this study was that the economic analysis provided strong support for investing in flood release measures in the Waza Logone region. Implementation of any of the proposed re-inundation options would lead to significant net economic benefits, and could be considered to be economically desirable over the current situation of reduced floods. On purely economic grounds, it was recommended that either Option X (generating the highest economic benefits, overall and relative to costs) or Option Y (the most robust option in the face of risk and uncertainty) should be implemented.

The Government of Cameroon, the local population of the region and IUCN are opened to multidimensional support to continue the exciting experience in Waza Logone region to help accomplish their vision of sustainable development.

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**CASE 6: *MULTI-STAKEHOLDER PLATFORMS FOR RIVER BASIN
MANAGEMENT IN EASTERN CAPE PROVINCE OF SOUTH
AFRICA***

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PROPOSED STATEMENT

Multi-Stakeholder Platforms (MSPs) involved in water resource management at river basin level have placed emphasis of their functional purpose on negotiation and dialogue among stakeholders. While negotiation and dialogue constitute a way in which stakeholders can voice their concerns, local community stakeholders want to see that their effort in attending stakeholder meetings is converted from voice to action that resolves their problems and provides tangible benefits.

ABSTRACT

The idea of cooperation among multiple stakeholders, who have different interests and needs with respect to water, to organize and arrange water allocation, distribution and management issues among themselves has emerged as an exciting concept for democratising river basin management. In South Africa, stakeholder participation in river basin management has been enshrined in the new water law (The National Water Act No36 of 1998). This case report shows how stakeholders are striving to respond to a government mandate to engage in partnerships in developing strategies for managing their own river basin water resources. South Africa's experience demonstrates the complexity of achieving meaningful stakeholder participation among different stakeholders coming from extremely diverse socio-economic and backgrounds. This exploration concludes that when Multi-Stakeholder Platforms emerge as a state initiative implemented through the enactment of laws, the State has a crucial role of ensuring that the process of forming water institutions is owned by stakeholder members. This can be achieved through developing new capacities to empower (all) stakeholders to overcome their 'limitations'⁶ and become legitimate owners of the process. Secondly, in order to maintain the commitment of stakeholders from local communities, water reforms should yield tangible results that benefit the underprivileged in real terms.

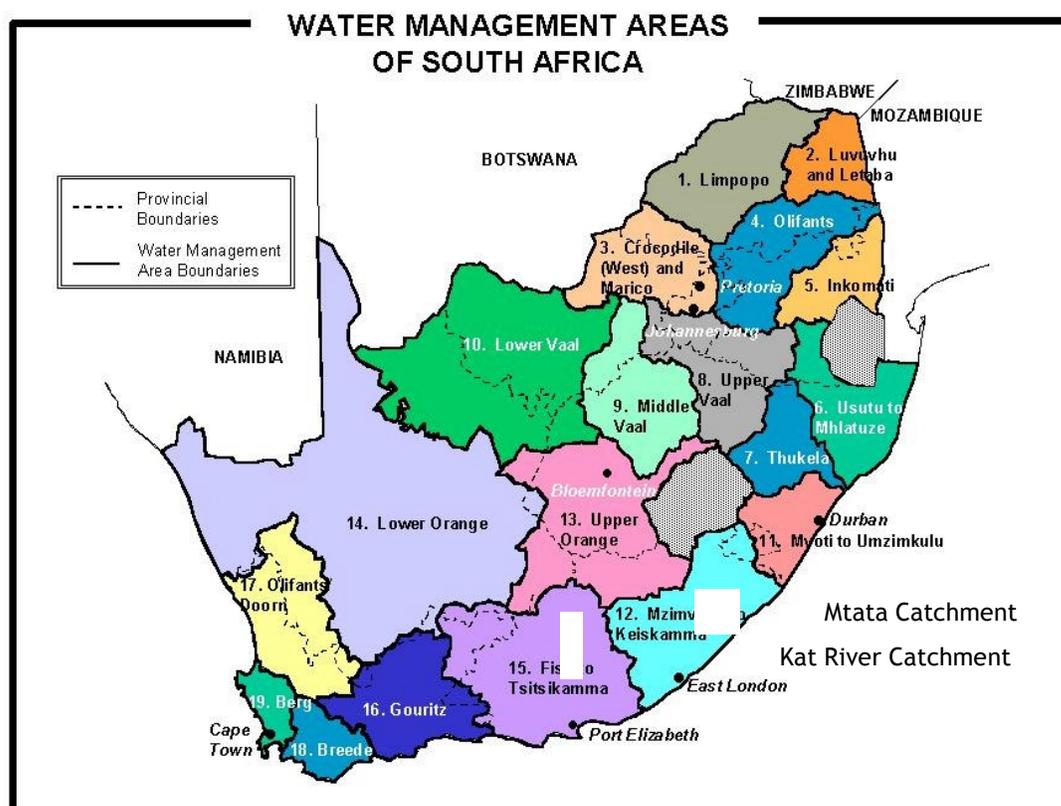
INSTITUTIONAL ENVIRONMENT FOR RIVER BASIN MANAGEMENT IN SOUTH AFRICA

In South African context, Catchment Management Agencies (CMAs), Water User Associations (WUAs) and Catchment Management Forums (CMFs) may all represent the notion of Multi-Stakeholder Platforms (MSPs) in water resource management. Through the promulgation of the NWA in 1998, the government declared the establishment of water management institutions and the "Catchment" (a river basin or watershed in South African philosophy) became the primary unit for water resource management. As a management strategy, South Africa was demarcated into 19 hydrological boundaries called Water Management Areas (WMA) whose boundaries traverse provincial and local government boundaries (see figure). A Water Management Area is a large-scale

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⁶ A more detailed exploration of the 'limitations' and the diversity of stakeholders in South Africa's water arena can be found in the on-coming book on MSPs to be produced by the MSP project of the Irrigation and Water Engineering Group of Wageningen University.

contiguous region of the country, defined by macro-hydrological boundaries, which provides the focus for national water balance planning under the National Water Resources Strategy (DWAF, 1998).



Within each of the Water Management Area, a Catchment Management Agency (CMA) is required to be established. A Catchment Management Agency is a self-regulatory body corporate with a Governing Board and an executive or administrative structure that has the statutory responsibility, power and financial autonomy to perform a range of Catchment Management functions in a declared Water management Area. CMAs become responsible for the implementation of Water Management Strategies in their designated areas.

The NWA requires the formation of new Water Users Associations (WUA) or transformation of the old water user boards such as Irrigation Boards (IBs) that existed during the apartheid government, to be reconstituted in accordance with the new regulations. A Water User Association (WUA) is a statutory body, representative of water users in a declared Catchment Management Area or part thereof, which have the power to develop and operate individual water supply schemes or engage in any (operational) water-related activity.

The Department of Water Affairs (DWAF) which on behalf of the state, is the sole custodian of water resources, has suggested the formation of a micro-level water institution referred to as the Catchment Management Forum (CMF). A Catchment Management Forum (CMF) is a non-statutory body, representative of stakeholders and organs of state in a declared Catchment Management Area or part thereof, which promotes Catchment Management implementation through consensual participation.

CMFs became the first river basin water management institutions to be widely established in South Africa. This was because as non-statutory water institutions, their establishment required no state

registration and was not dictated by any accompanying strict guidelines and stringent regulations. By the end of 2002, there were 200 CMFs reported to have been established in various catchments (DWAF, 2002). The emergence and functioning of two of these in the Eastern Cape Province is the object of this report. The process of establishing CMAs and WUAs posed unsuspected challenges. By the end of 2002, only a few completed proposals for the establishment of CMAs had been submitted to DWAF Minister. Eight years since going forth of the NWA Act, only one CMA had been approved. As for WUAs, only 43 proposals for the transformation of the old Irrigation Boards had been accepted by DWAF out of the 272 that were submitted by the end of 2002. The main reason for the rejection of most proposals was attributed to a poor public participation process.

At river basin level, CMFs represent the only water institution in South Africa capable of achieving the NWA's appeal for maximum public participation in the decision-making process through a representation of all water users and user sectors. They represent a form of Multi-Stakeholder Platforms (MSPs) which aim to bring together all major stakeholders in a new form of communication and decision-making in a designated catchment. Ironically, there is no specific mention of CMFs in the NWA. CMFs actually evolved as a realisation of the limited capacity at grassroots level and largely among black rural population, to make a meaningful contribution at the scale of WMA at which CMAs are to operate. CMFs provide a potentially effective platform for grassroots stakeholders to voice their needs and requirements for socio-ecological protection and socio-economic development. They can and have worked as building blocks towards development and constitution of larger catchment authorities such as CMAs.

A TALE OF TWO CMFS: PRIMARY ISSUES

In the Eastern Cape Province of South Africa and within the borders of an area formerly known as Transkei, lies the Mtata Catchment. The catchment falls within the Water Management Area 12 and is made up of three secondary catchments covering a total area of approximately 5500 km². The Mtata River is the major river draining the catchment with an average natural mean annual runoff of 382 million m³ per annum (DWAF 2001). The catchment is generally hilly with rivers draining deep valleys towards the southern coast into the Indian Ocean.

The 1995 population census figures of the Mtata Catchment indicate a population of 630 047 and a 2005 projection of 657 425 (DWAF 2001). It is estimated that 91% of the population is rural, living in small and remote villages. The only major town is Umtata, which used to be the governmental capital of the Transkei homeland during apartheid. The town functions as the centre for trade and business in the region. The main land use system is veld and grazing followed by settlements and subsistence agriculture. The Mtata Catchment is generally under-developed, and the area is characterised by a high degree of unemployment and high poverty levels. For a long time, the main economic base of the catchment has been the government sector, but has been shrinking since 1994 following the migration of the government provincial offices to another town (Bisho), about 250 kilometres away from the catchment.

The formation of the Catchment Management Forum (Mtata CMF) in Umtata was initiated by DWAF in 1999 and was undertaken with the help of private consultants. Series of workshops were held in the villages to inform local people of the purpose of a CMF. By April 2001, after a series of consultations with potential stakeholders, the Mtata CMF was inaugurated. The Forum had representatives from local communities (villages outlying Umtata town), representatives from Community Based Organisations, The University of Transkei, Non Governmental Organisations, traditional leaders and representatives from local municipalities (six municipalities) and the Departments of Water Affairs, Agriculture, and Environmental Affairs. However, in due course, the Forum became dominated by representatives of government departments and staff of the University of Transkei which is based in the main town of Umtata. Participation of local community members declined.

The Mtata River has been subjected to a fairly high level of stress. One example is the pollution of the section of the river that crosses the town center at an area called circus triangle. Local residents and small informal enterprises dump all kinds of waste materials alongside the banks of the river all of

which eventually end up into the river. Other pollutants include untreated sewage discharges from the surrounding squatter camps and from a nearby prison. It has been difficult for the Forum to address this problem due to insufficient representation support from the community and lack of capacity within the responsible local municipality.

The Mtata CMF has held eleven meetings since its inception. Attendance numbers indicate that fewer and fewer community stakeholders come to the meetings. Individual opinions of organisational stakeholders interviewed attributed the falling interest among community stakeholders to an initial misunderstanding of what the Forum was. They accused grass-root level community members of being full of unrealistic expectations. Organisational Stakeholders (representatives of governmental and non governmental organs) also present a different kind of apathy towards the Forum. If they manage to attend the meeting at all, they tend to send new faces at every subsequent Forum meeting. As a result, there is poor continuity in dealing with issues discussed at previous meetings.

DWAF can be identified as the driving force behind the Mtata Catchment Forum. It pays a consultant to function as secretariat to the Forum, ensuring that all necessary Forum operations such as organising meetings and circulating documents to members are undertaken. Community stakeholders also see DWAF as being responsible for ensuring that they are reimbursed for their cost of attending Forum meetings.

About 350 kilometers to the west of Mtata Catchment lies the Kat River Valley catchment falling in the Water Management Area 15. The catchment extends approximately 80km north to south and covers an area of approximately 1700km². It is characterised by a variety of land uses, ranging from export-oriented citrus farming and commercially oriented rangeland stock farming in the lower reaches of the catchment to community-based or small-scale agriculture and stock farming in the middle reaches of the catchment and commercial forestry in the north-western upper reaches (McMaster, 2002). It includes four game reserves. The area has extensive privately owned white farms with high levels of production. However, the largest number of farmers includes subsistence to emergent black farmers characterised by low levels of production. There exist also a high degree of poverty in the more densely populated sections where unemployment is high.

Among the observed serious environmental problems is soil erosion as a result of steep slopes that characterise the geography of the catchment. This problem has led to an increasing sediment output, which is seriously affecting the health of the river.

The Kat Catchment Management Forum (Kat CMF) emerged at about the same time period as the Mtata CMF. Unlike the Mtata CMF, the Kat CMF emerged as a result of activities of researchers from a nearby University called Rhodes. Researchers from Rhodes University undertook anthropological research in 1996 and 1997 that resulted into workshops in 17 villages from late 1999 to mid 2000. The aim of these workshops was to create environmental awareness (co-operative and responsible resource management). Upstream-downstream relationships between the villages was role-played and analysed. The awareness creation conducted through Participatory Rural Appraisal methods led to the build-up of the formation of the CMF in which broader issues relating to catchment management could be tackled.

Since the focus of Rhodes University researchers' activities was on the empowerment of previously disadvantaged communities, the CMF became dominated by a high representation of community members. The Forum is well rooted into the community structure of the rural Kat River areas. Commitment of organisational stakeholders in the Forum is however minimal.

The Kat CMF is actively engaged with a Land-care Project intended to address the erosion problem. The project is run by community stakeholders and funded by the Department of Agriculture. Despite the existing lack of management skills and project management experience among the community, the operations are proceeding well. The Land-care project offers a platform for capacity building and

empowerment. Experiences with the financial and organisational aspects of the project provide local people with important management skills and confidence.

CONCLUSIONS AND LESSONS

Representatives from local communities join the Forums with anticipation and great expectation of reaping practical benefits from the collaborative initiative. Responses to interviews of local people pointed to the fact that local people participated in expectation of action that would change their lives. In Mtata catchment for example, local people mentioned their desire for better quality water, access to piped domestic water and agricultural land. In the Kat River Valley Catchment, in addition to piped domestic water, local people were concerned about their environmental degradation and access to agricultural land. Unfortunately however, organisational stakeholders attached a different purpose to these Forums. They perceived them as platforms for dialogue alone and not decision making. DWAF describes the intended purpose of CMFs as simply to initiate the participation process that must underpin the establishment of CMAs (DWAF, 1999. p 2). It is difficult to imagine how a process that makes demands on local people's time and money could attract local peoples interest for the sake of deliberations (or indeed negotiations) as a form of collaboration. Referring to this same case, Warner and Simpungwe (2003) have argued that meaningful participation requires a mandate and resources enabling independent action. CMFs are non-statutory institutions with no legal power to enforce decisions arrived at in their meetings. They have emerged as committee style formats, in which representatives from various interest groups within government, industry, NGO's and community groups discuss issues and make recommendations often by consensus. The recommendations of the group are addressed to a government agency or any other relevant agency, relying largely on the willingness of these agencies to comply with the decisions. The Kat CMF can currently boast a potentially sustainable platform because it has managed to engage its grassroot members in a land-care project which does not only address soil erosion problems in the catchment but also provides an income to participants. Local people in the Kat river catchment attached legitimacy to the Forum particularly because of the land-care project.

BACKGROUND DOCUMENTATION

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