

**Managing Wetlands  
in Arid Regions**

**Lessons Learned**



# **Managing Wetlands in Arid Regions**

## **Lessons Learned**

**Edited by El Hadji M. Sene, Ibrahim Thiaw  
and Birguy Lamizana-Diallo**

**Programme of institutional capacity building  
for wetland resource management in West Africa**

**IUCN – The World Conservation Union  
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## Foreword

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Wetlands are an important part of the environment all over the world. Nowhere is this more the case than in West Africa, where water resources are generally plentiful, except in the northern parts (of West Africa), where low rainfall and recurring drought are serious handicaps. Wetlands perform the function of collecting and redistributing water; they are also biological rest areas and high potential ecosystems. When used in a rational and sustainable way, they can be instrumental in improving economic and social conditions for the poorest populations living in their vicinity.

The Kingdom of the Netherlands, in partnership with the World Conservation Union (IUCN), has for 15 years or so provided funding to the Regional Wetlands Programme for West Africa. The key goals of the programme were to draw attention to the strategic importance of wetlands, to gain a better understanding of wetlands and how they function, and to quantify their productivity and their contribution to local economies and the well-being of human populations. Achieving these aims requires funding, time and perseverance. My country's support to the programme can be explained by the high priority that water and environmental issues are given in the Netherlands' development assistance and cooperation programmes. The environment is as much a priority as poverty alleviation, education, reproductive health (especially the fight against the AIDS pandemic) and, more generally, the attainment of the Millennium Development Goals.

As this particular IUCN/Wetlands programme draws to a close and the major lessons learned are published in this report, we take this opportunity to voice our appreciation for the international and national partnership which has presided over the programme throughout its lifespan. At the end of many years of productive cooperation, it is tempting to look back and survey the work completed and the progress made. The beneficiary countries and their populations, who played their role to the fullest, are to be thanked for most of the programme's achievements. Of course we encountered problems along the way, as in any true pioneering action, but together we overcame them. Without a doubt, the seeds sown by the programme – knowledge confirmed or gained, protected areas created or strengthened, human resources trained and educated, resource-use models, institutional mechanisms and grassroots cooperatives established – will grow into a more widespread awareness of the need to preserve wetlands in the long term, in order to secure the goods and services they provide.

We hope that our partners in participating and beneficiary countries will pursue the ever-important work of strengthening and consolidating the achievements of this programme. All the work done will be in vain without deeper awareness and a total commitment by each country. The most difficult part remains to be done, that is to make the shift from a programme and project setting to the systematic incorporation of their key principles into national policies, programmes and investments. Herein lies the importance of the recently launched Regional Programme for Coastal and Marine Conservation in West Africa – PRCM – which was greatly inspired by the success of the Wetlands Programme.

In conclusion, I wish to thank our partner governments, their staff and the very active local populations. I thank and commend IUCN and the other participating organizations for the programme's achievements, which have already paved the way for several new partnerships and initiatives, and I wish you all a lot of success in securing the positive results of this programme.

*Johannes Jansing  
Ambassador of the Kingdom of the Netherlands to the Republic of Senegal*

# Acknowledgements

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## Acronyms and abbreviations

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ARPI	Project to Support the Retraining of Imraguen fishermen
CFA	African Financial Community
CNERV	National Veterinary Science and Research Centre
CNRADA	National Centre for Agronomic Research and Agricultural Development
CNROP	National Oceanographic and Fisheries Research Centre
CRODT	Dakar-Thiaroye Oceanographic Research Centre
DATAR	Directorate for Regional Planning and Action
DEA	Diplôme d'Etudes Approfondies (MSc)
DEARH	Department of Water Resources
DGIS	Netherlands Cooperation Development Agency
DPN	Department of National Parks
FFEM	French Global Environment Facility
FIBA	International Foundation for the Banc d'Arguin
FST	Faculty of Science and Technology
GEC	Savings and Loan Cooperative
GEF	Global Environment Facility
GREZOH	Wetlands Research Group
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IMROP	Mauritanian Oceanographic and Fisheries Research Institute
ISE	Institute of Environmental Sciences
IUCN	The World Conservation Union
LWF	Lutheran World Federation
MAB	Man and Biosphere Programme
MARP	Accelerated Method of Participatory Research
MEPN	Ministry of the Environment and Nature Protection
MPEM	Ministry of Fisheries and Maritime Economy
NGO	Non-governmental organization
OMVS	Organization for the Development of the Senegal River
PDAT	Master Plan for Regional Development
PNBA	Banc d'Arguin National Park
PND	Diawling National Park
PNDS	Saloum Delta National Park
PNOD	Djoudj National Park
PQGI	Five-year Integrated Management Plan

PTGI	Three-year Integrated Management Plan
RBDS	Saloum Delta Biosphere Reserve
RPC	Coastal Planning Network
RENZOH	National Wetlands Network
SAWEG	Sahelian Wetlands Expert Group
SONADER	National Company for Rural Development
UM	Ouguiya (Mauritanian currency unit)
UNESCO	United Nations Educational, Scientific and Cultural Organization
VPDI	« Vers une Pêche Durable Imraguen » (Toward a Sustainable Fishery for the Imraguen)

## Executive summary

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From 1989 to 2005, IUCN implemented a regional programme entitled “Building Institutional Capacity for Wetland Resources Management in West Africa” in several West African countries, with funding provided by the Netherlands Ministry of Foreign Affairs.

The programme was initially designed with five Sahelian countries (Burkina Faso, Mali, Mauritania, Niger, Senegal) in mind. In the end, due to organizational changes within the Netherlands Development Cooperation Agency, it was not carried out in Burkina Faso, Mali or Niger. This makes the results obtained in Senegal and Mauritania all the more significant and weighty. However, the regional activities planned within the programme went ahead in 12 countries ranging from the Sahel to the Gulf of Guinea.

The salient features of the programme are:

- its broad range of activities: habitat restoration and conservation; knowledge creation and dissemination; human resources development; exchanges of information, experience and expertise; promotion of ecodevelopment, etc.;
- a site selection process based on either wetland status (protected or un-protected), location (coastal zone or deltaic sites) or socio-economic environment (predominantly agricultural, pastoral or fisheries-based);
- the wide variety of stakeholders involved: public administrations, local governments, donors, NGOs, scientists, community-based organizations, etc.

The inherent richness of the programme provided IUCN with a golden opportunity to enhance its experience in wetlands management, and for the participating countries, it was one of the first chances to tackle the issue of managing West African wetlands, which had hitherto been overlooked.

After an implementation phase spanning more than 15 years, it was deemed essential to extract and review the lessons learned through this experience. Hence this document, which stems from a study carried out at the behest of the external evaluation mission during phase III of the programme, and whose aim was to analyse the experience as a whole and shed light on the successes, shortcomings, strengths and weaknesses of the programme as implemented.

The ultimate goal is to “organize knowledge acquired through practice in such a way as to make it transferable”. In this respect, it is not a conventional evaluation which would attempt to measure whether all of the programme’s targets had been reached by looking at outcomes and means deployed (although this was done several times by internal and external missions alike), but rather an effort to extract the knowledge acquired from the experience in terms of process and methodology. The purpose of the exercise is to extrapolate practical methodology and confirm the approach so as to offer each interested party a road map and a practical operational model. An approach is described for making the principles available to all those who wish to understand the issues involved in wetland conservation and development and to actively seek solutions.

As a first step, we have extracted and collected lessons learned; the first section of the document provides a brief overview of steps taken to ensure that these lessons, as well as cognitive messages acquired and important social relationships, were not only identified but kept for future use. What types of experience were gained? What was learned about the wetland habitats? What observations can be made about wetland trends and processes resulting from the implementation of specific projects within the programme? What patterns of social organization or reorganization were triggered by it? These are the kinds of questions raised in Part one of the document in a more focused way than in a “lessons learned” exercise, albeit with frequent reference to the latter.

The study was carried out in several phases:

- a) a preparatory phase involving drafting terms of reference (necessitating clarification of the terms “lessons learned” and “evaluation”); defining the scope of the study by determining the spatial framework and selecting study subjects: sites were chosen in both Mauritania (Diawling National Park (PND), Banc d’Arguin National Park, PALM) and Senegal (PNOD, RBDS), and a vulnerable resource identified (mullet);
- b) selection of major themes subsuming the main activities within the programme:
  - training, organizing meetings and networks, providing support to training institutions and universities;
  - development and management of specific sites and vulnerable resources;
  - mapping programme activities;
  - communication;
  - promoting publications.
- c) A drafting phase relying on the wealth of written documentation produced:
  - Literature review;
  - Gathering and analysing field data;
  - Processing data;
  - Drafting sectoral reports and a comprehensive report;
  - Validation exercises;
  - Summing up and feedback from programme staff before finalization of the project.

The document is divided into three parts:

- An initial set of the most noteworthy lessons learned, showing how the Programme has been instrumental in enhancing knowledge and experience on wetlands and approaches to wetland conservation and development;
- Lessons learned which, as mentioned above, describes approaches used by IUCN and programme teams in designing and implementing the project;
- Appendices showing the achievements and products of the programme by geographical location.

Taken together, these elements make it possible to grasp the key outcomes of the project as a whole and those in major sites such as Banc d'Arguin and Diawling National Parks and the coastal zone in Mauritania, Djoudj National Park and Saloum Delta Biosphere Reserve in Senegal.

In imparting lessons learned, available information is provided on the following points:

- ***IUCN's pioneering role and action*** in West Africa in the field of wetland resources conservation and development in conjunction with the Secretariat of the Ramsar Convention and other organizations;
- ***The main areas covered by the programme***, i.e. **training** in the broadest sense, including vocational education and training, generating capacities to understand and use best practices in this field; **resource management** from a range of perspectives – conservation, local development, legal and policy framework; **sub-regional cooperation and networking**;
- ***The implementation strategy***, which emphasises the ecosystem approach and a large social and participatory dimension which is a novelty in itself;
- ***Capacity building*** through which the programme has created an institutional base for wetland conservation and development. Strengthening local governance and introducing the gender approach were also important points;
- Finally, the document gives detailed accounts of the ***local conservation and development activities*** which were the backbone of the field work of the programme. Through these activities, ecosystems were restored and returned to a functioning state, malfunctions were corrected and local development, ecotourism and access to credit were promoted in contacts with farming communities, pastoralists and fishermen. The programme made a seminal contribution to scientific knowledge about wetlands, both from the viewpoint of resources and that of wetland processes.

The second part of the book reviews the methodological stages involved in the programme as set out in the following chapters:

- ***Background and rationale for IUCN action*** in West Africa, which is typified by arid habitats but also possesses a large number of wetlands requiring conservation and sustainable development;
- ***Details on the implementation of the programme***, including the following components: habitat restoration, ecosystem conservation (and more specifically protected area conservation), socio-economic activities (ecodevelopment, ecotourism, microcredit schemes for project sites), issues related to access to water resources;
- ***Improving knowledge, teaching and research*** – in these areas the programme supported training institutions at universities in Nouakchott, Saint Louis and Ouagadougou and disseminated many studies on wetlands in the sub-region. It also actively promoted the emergence of networks dealing with wetlands in each participating country and throughout West Africa;

- ***Institutional support***, which made it possible to establish university courses in wetlands, enabled networks to raise their profile and begin to influence policy choices and national legislation, and strengthened government departments and agencies in charge of protected wetlands conservation.

The strengths and weaknesses of the programme are pinpointed both through the lessons learned and critical reviews of procedures in the two-part study. All in all, it can be said that the programme strategy, based as it is on a combination of site work, capacity building through training, public information and communication initiatives, has produced positive and promising results on the ground. The strategy is thus an appropriate one for seeking solutions to the problem of ecosystem degradation and for producing tools for sustainable resource management.

Two final challenges remain, that of anchoring the set of processes established permanently in national systems, and that of ensuring that institutional takeover will continue and that mechanisms put in place at grassroots level and in the political sphere will prove sustainable. The programme and the states which took part in it are now equipped to rise to these challenges. The men and women who received training, the institutions and mechanisms put in place and the already increased level of political awareness all give us hope that the conservation and sustainable use of West Africa's wetlands will continue to be strengthened and consolidated. The door is now open for a more lasting awareness of the importance of wetlands and for their inclusion (not just as an afterthought) in all economic and social development, as well as environmental protection programmes, from here forward.

## General introduction

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In September, 1975, the Kinshasa Congress issued a strong call to IUCN to adopt a more active profile in West Africa, particularly in the Sahel, where problems of drought and accelerated degradation of natural resources had been rife since the beginning of the decade. IUCN heeded the call, stepping up and diversifying its involvement in West Africa at the beginning of the 1980s: a sub-regional office was opened, along with national offices which were very active and focused on grassroots solutions to problems and needs.

The field of wetland conservation and use was the arena for major initiatives under the Programme of Institutional Capacity Building for Wetland Resource Management in West Africa. It was launched in 1989 and ran for 16 years (until 2005) in various configurations with a total budget of 12,339,558 Euros. Initially designed on a sub-regional scale which would encompass all West African countries, in the end the programme focused on two countries, Mauritania and Senegal, for all field activities. A large number of more general activities (information, communication, training and research support) brought a larger number of countries into the fold through conferences, workshops and other meetings.

The activities covered a number of areas. Institutional support was accompanied specifically by local, technical and professional-level training activities; this was done by establishing, or supporting the establishment of, teaching structures which are presently operational. In the field, research on the natural environment, baseline assessments of producer groups, conservation planning and the promotion of revenue-generating activities were all developed with input from the populations based on the ecosystem approach. Sites were chosen according to their importance for wetland conservation, but also for biodiversity in general. The group of conservation units comprised Banc d'Arguin National Park, Diawling National Park and the Mauritanian coastal zone in general, Djoudj National Park and Saloum Delta National Park and Biosphere Reserve in Senegal.

The purpose of this publication is to report on the achievements of the Wetlands Resources Management Programme. The first section presents a summarised review of lessons learned during the implementation of the programme; it attempts to extract and assimilate clear and practical lessons, confirmed cognitive learning and social relationships created by the programme. In the second section, the successive stages of the programme are described in detail from the design phase to construction and implementation, focusing essentially on Mauritania and Senegal. An approach is extracted from this description, a way of making the principles and the method for applying them accessible to all who wish to understand and tackle the problems of wetland conservation and development.

As the programme draws to a close, it is important to create a perspective in which its implementation and outcomes can be understood and projected into the future. The programme's approach and concrete achievements can be considered very positive if one looks at a number of other international and regional initiatives and strategic directions taken since its inception. One of these is the Millennium Development Goals (MDGs), a consensus-based list (adopted in 2000) of the major challenges that the international community has committed to

meeting by 2015.<sup>1</sup> Although IUCN's programme is mainly relevant to one element of Goal 7 – Ensure environmental sustainability – it in effect developed activities which also relate to the other seven goals. Water, the environment, health, agriculture and biodiversity are key components of the MDGs; and they are precisely the areas in which the Programme holds a high level of expertise. Equally, the partnership established through the national and sub-regional wetland resource conservation and development networks is closely matched to MDG 8 – Develop a global partnership for development.

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<sup>1</sup> The eight Millennium Goals aim to: i) Eradicate extreme poverty and hunger; ii) Achieve universal primary education; iii) Promote gender equality and empower women; iv) Reduce child mortality; v) Improve maternal health; vi) Combat HIV/AIDS, malaria and other diseases; vii) Ensure environmental sustainability and viii) Develop a global partnership for development.

**Part one:**

**Lessons learned**



# 1. Introduction

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## 1.1 A description of the exercise

The second part of this report gives a detailed account of the design, development and implementation phases of IUCN's Regional Programme on Wetlands in West Africa, focusing mainly on Mauritania and Senegal. From this review, we have drawn a methodology, a description of the approach, with a view to providing all interested parties with a road map and an operational model. The approach thus extracted is used as a way to make the principles and the method for applying them accessible to anyone who wants to understand and tackle wetland conservation and development issues. This chiefly entails lifting the barriers and countering the threats to the physical integrity and biodiversity of the sites under discussion.

In this first section, we offer a brief overview of what the programme accomplished, the better to extract and retain the practical lessons, cognitive learning and social relationships it gave rise to. The questions the section attempts to answer are the following: What experience was gained through the programme? What new knowledge about wetlands was acquired? What can be said about their evolution and processes following implementation of the projects? What types of social organization or reorganization were triggered by it? The focus is more on these questions than on recapitulating all lessons learned, although frequent reference is made to them.

The reader may have the impression that some points are repeated since each component or aim of the programme and its individual projects are analysed in terms of lessons learned, much as was done in the section dealing specifically with the latter. Furthermore, the line between a post-project evaluation and identifying lessons learned may not always be a clear one, and the risk of partial or minor repetitions is always present. We have done our best to keep repetition to a minimum. It is important to keep in mind that the ultimate goal for all concerned is to learn, to establish a body of knowledge and know-how and create an institutional memory which will be the basis for future ideas and action. From this perspective, a certain degree of repetition can be of positive value for learning.

## 1.2 Baseline review

IUCN has been working on wetlands in West Africa since 1989 and, as previously mentioned, its action to increase knowledge, improve conservation and provide more sustainable ways of using wetlands is highly innovative.

### **The situation at the outset**

The general situation of West African wetlands before the programme was launched (i.e., in the mid-1980s) was as follows:

- There was little awareness of the importance and potential of wetlands, indeed they were often perceived as hostile environments requiring improvement by man;

- Wetland use was mainly consumptive and destructive: irrigation or draining to reclaim the land for planting trees (often eucalyptus). The development of wetlands, river valleys or floodplains was often linked to major rice-growing schemes in the Niger delta and the Senegal river valley;
- The high diversity of wetland types (from oases in the north to temporary lakes and floodplains, deltaic marshes, *bolons* (mangrove channels) and *rias* (deepwater estuaries) and their flood areas, flooded river valley landscapes, ponds and lakes, lagoons, *marigots* (marshes), rivers both small and mighty...) generated little interest or attention in terms of either research or development projects. In a way, this was probably for the best, since poorly planned development could have resulted in economic and ecological disaster;
- Conservation initiatives were thin on the ground and, although some protected areas had been set up, they attracted very little interest for research or development projects. Listing wetlands under the Ramsar Convention has not, in the majority of cases, resulted in the requisite conservation measures being taken;
- On the other hand, wetlands are legitimately considered by governments and populations alike as land which could potentially be used for food production in countries where problems of food security are either a threat or a reality.

IUCN's involvement in the complex field of West African wetlands dates back to the early 1980s, when the first studies and work were carried out on several floodplains in the inner Niger delta (Mali) and northern Nigeria. In 1994, IUCN held its first meeting on floodplains in West Africa. The meeting and the results it produced clearly highlighted two points:

- i) the diversity and often conflicting nature of different uses – and users – of highly productive wetlands;
- ii) the possibility and importance of finding models of mutually agreed and shared wetland use which could be sustainable. Although the meeting began in an atmosphere of extreme hostility, it miraculously evolved into a session of active listening and consensus seeking, and later resulted in the publication of an exceptional collective work entitled *Toward sustainable management of Sahelian floodplains*, in 2000. It also spawned a regional network, SAWEG (Sahelian Wetlands Expert Group) which has perpetuated the spirit of the conference and worked to promote the principles and practice of wetland conservation and sustainable use in the region.

Gradually, IUCN has taken the leading position among international organizations in wetland conservation in this part of the world.

### **The programme and its areas of action**

When working in uncharted territory it is important to follow two common sense principles in the initial planning stages: first, to identify the requirements stemming from the habitats, resources, natural processes and the needs of human populations who use them or are involved in the work and secondly, to carefully choose one's partners based on knowledge of those available and their skills. IUCN seems to have understood this, since it directed the first phases of its wetlands programme in exactly this way. A third challenge also awaits all would-be pioneers, especially in natural areas in high demand: expectations for tangible results to be achieved are high among not only the direct users of the resources but also among politicians,

who are the target of many pressures above and beyond that of promoting their own careers. In this context, the programme wisely made the following choices which carried it from the launch through to the end of the fourth phase:

**Start up cautiously and scale up gradually:** The staged approach was chosen as much for methodological reasons (starting simple and adding degrees of complexity, moving outwards in concentric circles) as for reasons of limited funding which made a realistic attitude a necessity from the beginning. In practical terms, it entailed:

- i) starting with existing operational capacities for simple activities;
- ii) working closely with the beneficiaries to achieve the first concrete results;
- iii) establishing within the project itself the tools and methods needed for gradual consolidation and expansion.

**Target partners across the entire range of social profiles, from local populations to decision makers:** this was the approach chosen by the project. Producers, civil servants, managers and high-level political decision makers all played the roles of active participant, partner, adviser or receiver of messages from the project at various times. This approach worked vertically in each country and at each site, but also horizontally, between counterparts in different countries.

**Incorporate the education, research and extension (information/communication) triad into all areas of the programme:** this is a key element for transferring knowledge, know-how created or reconfirmed by the project, and also good practices.

**Apply the ecosystem approach:** the project used the ecosystem approach throughout. The effectiveness of the approach will be confirmed by an assessment of its functioning.

**Adopt a vision with a sub-regional dimension:** this dimension, which aims to ensure the overall consistency of the project, was focused on the structural components of the programme and the major common functions (collaborative research, training, exchanges and networks...). The sub-regional dimension guarantees coherence within the programme and is the driving force for better dissemination of the project's achievements at regional level.

Using the above-mentioned principles, three areas of action were developed for the four programme phases:

- **Training** in the broadest sense of the term, including education and vocational training, informal training and generating the capacity to understand and replicate good practices in one's field;
- **Resource management** from all possible perspectives, i.e. conservation, local development, as well as the legislative and political frameworks which guide resource management;
- **Sub-regional cooperation and networking.**

Using this basic template, IUCN added a series of strategic choices including the selection of appropriate demonstration sites; conducting a series of training modules geared towards decision makers, technicians or teachers; establishing a multidisciplinary network of experts from scientific and technical backgrounds; putting together cohesive teams able to work together harmoniously and motivate each other from one project or country to another.



## 2. Implementation strategy

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The programme was implemented with several guiding principles in mind, such as the ecosystem approach, the establishment of partnerships to support the programme as it unfolded and the promotion of the participatory approach. A red thread running through the entire range of programme activities was capacity building through activities adapted to fit the various components of the programme. Key lessons about implementation are reviewed herein for the three elements indicated above.

### 2.1 The ecosystem approach and its corollaries

For the purposes of the programme, the ecosystem approach was defined as “a strategy for integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”. The Convention on Biodiversity defines the ecosystem approach as “...the approach...based on the application of appropriate scientific methodologies focused on levels of biological organisation, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems”. Twelve guiding principles are provided as an aid to applying the approach; they include items on the natural systems which must be dealt with as thoroughly as possible and in their functioning state, the involvement of populations, the importance of taking the economic and social dimensions into account, etc. We can thus see that in both definitions of the ecosystem approach quoted, the basis for all action in the field of natural resources is three-pronged: environmental, economic and social. It is in this perspective that the lessons learned from the programme should be considered.

### Social approaches

The programme built its action on input from the populations; their needs as expressed and, insofar as possible, their wish to have a say in the directions and types of activities selected were taken into account. The following key points illustrate how our approach was developed:

- A major shift in approaches – from the paramilitary (regimented and highly controlled) approach of government departments to an effort to work together to build understanding and consensus in Djoudj National Park;
- The major communication campaign carried out during the establishment and first stage of management of Diawling National Park;
- The iterative dialogues which took place regarding Saloum Delta Biosphere Reserve;
- The importance attached to traditional values and knowledge which came to light, for example during the mullet project; decentralization of decision-making on actions to be taken down to the lowest appropriate level, the direct users of the resource;

- A series of training sessions aimed at explaining the integrated approach, but also at highlighting and sharing good practices so that they could easily be adopted by partners at all levels in their day-to-day work;
- Empowering socially legitimate operational entities and strengthening their capacities.

These and other ideas (that economic benefits and opportunities should be shared equitably, that it is important to strike a balance between conservation and use) significantly enhanced the social dimension of the programme and its projects.

## **Partnerships**

The list of partnerships which sprang up around the regional wetlands programme is a long one. Some were involved in the very early days of programme design, funding and supervision. The majority of these partnerships were with donor or cooperation development agencies.

Others joined in the implementation phase, mainly the implementation team itself, along with beneficiaries and stakeholders in the field.

As reported in Part two, the programme experience was a positive one in many respects, but it was not without its share of difficulties. The lessons we can learn from this are:

- The need to create a climate of complete trust between the external partners and the implementation teams;
- The need for partner institutions at national level to invest their best human resources in project implementation and to facilitate opportunities for dialogue between external and local project staff;
- The desirability of giving local teams a good deal of freedom to stimulate creativity, innovation and brave proactiveness; the large number of opportunities for meetings and discussions recommended above allows for this freedom with little danger of getting off track, since there are many opportunities to check, adjust, and remedy.

## **The participatory approach**

The participatory approach holds great appeal and has become the rallying cry of development and conservation circles. However, its success depends on a number of preconditions being met, something which is not always possible in projects. Although long advocated as an isolated policy, in recent years (and especially from 1990–2000) it was borne along by the currents of democratization, decentralization, subsidiarity and pluralism. Our programme occasionally encountered difficulties in implementing a participatory approach, some more serious than others. They were mainly due to insufficient explanation or empowerment, to errors in the choice of local partner organizations, and to a poor understanding of positive and less positive traditional standards and the weight they carry. Particular mention should be made of the following lessons learned:

- Strong involvement of national institutions in major initiatives is essential to ensure that they will later be accepted and officially incorporated into texts and rules governing local initiatives which must be aligned with conventional legal provisions;

- The constant presence on-site of a minimum team of field staff and supervisors is necessary to ensure that the social system and social issues are completely understood. It was difficult to avoid moving staff members of technical cooperation programmes from one project to another. A minimum number of people must always be based on-site, even if this means organizing extra training specifically for this purpose;
- Providing sound training and giving people appropriate levels of responsibility early on in projects is essential, indeed this can be seen as sowing the seeds of sustainability for the programme's initiatives and investments;
- The withdrawal strategy of technical project leaders and donors must be part and parcel of the project's implementation strategy, including means and mechanisms to assist them;
- A basic effort must be made to recast technical concepts – and more specifically terminology related to the environment, conservation and approaches – in line with local values, languages and local vernacular to allow people to adhere more strongly to the project. In our case, the concepts and values underpinning the ecosystem approach, although somewhat complex, would have been better understood had we adapted them to local language and vocabulary and discussed them with the primary and secondary beneficiaries as a way of increasing buy-in and sustainability.



## 3. Capacity building

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All development or conservation/development projects must ensure that certain conditions are met if they do not wish to end in failure. One is to have re-trained or specially trained human resources, and another is to have a stable workforce whose members can reinvest their knowledge and expertise in the projects and aims they serve. The foundations of capacity building include i) the education, training and information/communication triad, ii) an institutional framework, iii) a system of communication and exchange, iv) means of empowering local stakeholders and institutions and equipping them for action. A variety of major achievements were made during the implementation of the programme at all the project sites, and each of them deserves more space than this chapter can devote to them. These few pages are not, therefore, an exhaustive rendering, but rather a summary of the quintessential points.

### 3.1 Programme management framework and institutional strengthening

Strengthening institutions emerged as a high priority during implementation, and the programme was able to institute elements and processes which not only worked at the time but have already produced political, strategic and more tangible results which have excellent chances of outliving it. From feedback concerning the details of relationships between project leaders, the authorities and beneficiaries, we have learned a number of lessons which must be observed in any process:

- All facets of the institutional dimension must be considered, from centralized policy-making, planning or implementing bodies to decentralized provincial and local entities. The programme was able to engage in both dialogue and cooperation with central administrations, field services, local communities and user and producer groups in Diawling and Djoudj National Parks as well as in Saloum Delta Biosphere Reserve; with elected officials (members of parliament, mayors, etc.), who joined through training sessions and networking activities; funding agencies (e.g. the African Development Bank) and technical and scientific training institutes.
- The continued existence of the institutions created or strengthened by the programme seems somewhat uncertain. In this instance, the fragile and uncertain post-project situation makes it difficult to predict the outcome for the systems and mechanisms put in place. Only ongoing work to build capacities and disseminate knowledge can guarantee a continuing awareness of the importance of wetlands and a desire to strive to preserve them.

### 3.2 Capacity building: Education, training and popularization

Training programme beneficiaries at all levels and building competent and well-informed institutions were the first priorities noted by the programme across all projects and sites. Despite the inherent difficulties involved, it seems that more work should have been done at the

conceptual stage, because explanation of the requirements of the integrated management approach is necessary for a thorough understanding. Furthermore, in order to interest people whose acts have a direct effect on resources, action should have been taken at intermediate level and in the field to adopt good practices and gain know-how to be used in basic site work.

The activities we feel contributed to meeting these aims are numerous:

- i) practical training for regular resource users (farmers, pastoralists, fishermen, foresters, harvesters of natural products; traditional boat carpenters; women who process fish or weave mats; gatherers and processors of various products; those who engage in ecotourism-related activities, etc.
- ii) refresher courses or in-service training for middle management, decision makers and resource management planners who influence legislation, regulations and policies and even the general direction of activities in the field; the programme trained over 100 technicians in some five training workshops organized in the sub-region;
- iii) training leading to a diploma; this was geared toward new or promising staff who are being redeployed and need new and/or higher qualifications. It requires them to begin or resume a formal course of education or training. The University of Nouakchott (20 students received assistance in writing their theses) and the University of Ouagadougou provided support for this initiative;
- iv) environmental education and communication for the public at large as well as decision makers, the objective being to spread ideas and values related to the conservation and sustainable management of wetlands;
- v) conferences, workshops and other events used as tools for fulfilling the various functions mentioned above. Some 130 managers received an introduction to and information on issues related to water, wetlands, river basin management, etc;
- vi) visits and exchanges, one of the most lively ways of comparing experiences and transferring knowledge and know-how;
- vii) networking, which promotes team spirit and an ongoing exchange of experience, and also facilitates progress in the field in question, especially in terms of research;
- viii) field experiments carried out by members of the networks to test methods advocated (i.e. inventories) in countries where there is often little funding available for field work.

Many lessons were learned in this broad area. They are important ones, and the summarised account given below could allow new projects to save a great deal of time in future:

- All elements of capacity building are linked, and it is important for programmes and projects to draw up an integrated training and capacity building plan before work begins, taking into account human resource needs and constraints. Using this approach made it possible to avoid the all too familiar situation in which large amounts of resources are used in urgent situations, thereby causing the project or even the target sector to lose capacity;
- The use of traditional knowledge enriched our practical training and was included in the curricula. The tremendous knowledge held by fishing communities as diverse as the Imraguen (of the Banc d'Arguin), the fishermen of Saint-Louis (with their *pirogue* technology), and the Niominka (*bolon* fishermen and traditional mangrove users)

significantly improved practices used in the projects throughout the implementation phase;

- Ongoing training must target human resources in the thematic and geographical areas covered by the project. Insofar as possible, it should be organized in synergy with other partners who can bear a share of the costs. This approach was used with great success by the programme;
- Environmental education sessions should be combined with modules specifically designed for schools. Used in this way, environmental education becomes a powerful way of leveraging support and involvement within families and communities, a concept which the programme actively promotes;
- Forming alliances with training institutes (be they university institutes, faculties, or specialized schools) is a way of getting topics incorporated lastingly into official courses and training programmes, as well as gaining the continuing commitment and involvement of said institutions. The programme established strong linkages with universities and training institutes in Nouakchott, Saint-Louis, Dakar, Cotonou and Ouagadougou, and with the Ecole de Faune de Garoua (Cameroon) which spread the good word in receptive circles. Our hope is that the curricula developed and research initiated will be pursued long after the programme has ended;
- Emulation between peers is also a powerful motivational tool. Opportunities such as exchanges and visits were provided for staff working on different sites and in different countries. This led to the spontaneous replication of initiatives based on examples from other sites or projects, and these often proved to have a sustainable effect at local level or even on legislators.

### **3.3 Promoting and facilitating the work of staff in the field: Local governance and the gender approach**

The actions mentioned above are no guarantee of effectiveness if field staff are working under adverse conditions, in other words if the population is against them. The programme devoted tremendous effort to issues of social organization and equitable access to resources and benefits deriving from the projects. Lessons learned about local governance and the gender approach are reviewed below.

#### **Local governance**

The main obstacles in establishing local governance were often i) the lack of legal and regulatory frameworks for organizing and promoting the official recognition of grassroots bodies and their work on resources; ii) poor understanding, lack of involvement and/or interest by the populations; iii) insufficient homogeneity in the human groups involved. The programme encountered and overcame these difficulties and we can thus highlight the following strategic lessons:

- It is important to be familiar with the basic legislation and regulations governing the organisation of decentralized groups and communities as early as the design phase of the

project, if sustainability is to be ensured. The lasting post-project existence of these tools and groups must also be negotiated early on in the development of the project;

- Social organization for action must be in harmony with the central and decentralized authorities and also with the technical services. The lack of proper legal status can hinder the effectiveness and commitment of groups established within the project. In the worst case scenario, it may even result in their general discouragement and irreversible disengagement from the project;
- Early training and participation by such groups is a key to the success of the project and a way of attenuating the effects of a high rotation rate of government staff;
- For any project, no matter what precautions are taken, the biggest concern in the post-project period remains ensuring that good habits and appropriate processes will be perpetuated.

### **The gender approach**

In the countries covered by the programme, the gender approach should be seen as a process of gradually correcting gender imbalances favouring one sex or the other. Furthermore, it should be seen as a process of supplementary training aimed at improving the effectiveness of beneficiary groups, often women. Above all, militant and adversarial attitudes must be avoided, as these are an impediment to constructive dialogue. Our experience in the project has shown that:

- Women became strongly involved in the activities developed, much more quickly than their male counterparts and often with more striking results;
- Poor women invest nearly all the income they earn from the projects in meeting their family's immediate needs: buying better food, paying for clothing, healthcare or schooling for their children, etc;
- The loan repayment rate in women's credit groups is often much higher than that of the men. One possible explanation is that emulation, social solidarity and self-control are all more prevalent in women's groups than in men's.
- In development projects, feelings of envy and resentment often develop when women are quicker to understand the issues or mount initiatives. Situations of this kind arose in the programme and have also been encountered in a number of other projects;
- Activities initiated with mixed groups often prove to be more successful and produce more lasting results than working with single-sex groups; it seems important to develop attitudes of solidarity and complementarity in societies like the ones covered by the project.

## 4. Conservation, restoration and development activities

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The purpose of this section is to highlight lessons learned from the actual carrying out of the programme, i.e. conservation and habitat restoration activities, but also local development activities, in other words all site-based activities that alter (management, rehabilitation, use) the status of resources and the processes which support ecosystem functioning. Discussion focuses on i) giving due consideration to the importance of the socio-economic, political and cultural context; ii) the methodological approach; iii) the range of conservation and restoration activities; iv) development activities which preserve the ecosystem and are adapted to the needs of the local communities.

### 4.1 Socio-economic, political and cultural setting

In the decades after African states gained independence, most conservation activities were set in sites that until then had been managed by powerful government organizations with large manning strengths in the field (Water Department, Forest and Hunting Department, National Parks Department). The model on which relations between these departments and the population was based was not conducive to public consultation or participation. Although the development of community-based or participatory forestry starting in 1978 opened up the forestry sector and made dialogue with forestry administrations possible, National Parks Departments remained largely immune to these changes in many countries, continuing to display the features of post-colonialism. Such was the situation in the majority of sites chosen for the programme, in particular in Djoudj and Saloum Delta National Parks. The programme's approach was entirely premised on creating a favourable atmosphere for collaboration between partners and local stakeholders. The lessons which emerged from this experience as the programme progressed at the various sites include:

- It is important to be familiar with experience at national level but also at regional level before launching conservation action. Information can be spread quickly, particularly through nearby populations and technicians from neighbouring countries. In this respect, the regional approach carries the added advantage of creating a certain positive emulation factor between the populations and project teams in neighbouring countries;
- The experience of Djoudj National Park in Senegal was widely publicised in Mauritania, and the confrontational situations there as well as the positive developments over time were useful in developing the programme, especially in the process leading to the establishment of Diawling National Park;
- The simultaneous approach capitalizes more fully on the experience in the sub-region and the experience of each individual country through more frequent exchanges;
- A positive national and sub-regional political situation is a factor for sustainable progress. Initiatives in the Senegal delta (Diawling and Djoudj) undoubtedly benefited from the constructive framework of cooperation with OMVS and the good bilateral relations

between Mauritania and Senegal. This situation has already had proven indirect results, such as the joint proposal for a transboundary biosphere reserve in the Senegal delta. Additionally, joint activities led to better transboundary cooperation. Managers of conservation sites on either side of the Senegal river had never combined forces, resources and enthusiasm in quite the same way as they did when they undertook to i) set up a transboundary biosphere reserve and ii) organize a Lower Senegal Delta Fair, the first of which is scheduled for late 2005.

## **4.2 Methodology**

As we revisit the ecosystem approach, we wish to emphasise the following points: i) the process was a collaborative effort involving several groups; ii) it was essential to reconcile economic opportunities and the needs of living communities with the need to preserve ecological integrity (of habitats and processes) and biodiversity. The programme stated its commitment to this approach from the outset and it was on this basis that the integrated management plans were formulated. Things to be remembered regarding the application of this methodology in the field include the need to i) explain and ensure an operational understanding of the concept; ii) identify ecosystems and homogeneous units; iii) identify partners and their roles; iv) be aware of threats to and pressures on ecological integrity and biodiversity; v) design the series of resource-based activities with a view to achieving the objectives of the ecosystem approach. The following points should be noted:

- All partners were exposed to activities aimed at explaining and sharing the concept, mainly through their involvement in developing integrated management plans for the sites;
- There was necessarily a minimum size for ecosystems in order to be able to consider them as sufficiently complete systems compatible with the ecosystem approach. It must, however, be pointed out that both in Diawling and Djoudj parks in the north, and the Saloum Delta Biosphere Reserve in the south, artificial barriers (Diamas dam, the Sokone-Banjul road and other man-made structures) limited the scope of the approach and the idea of ecological integrity in programme activities on these sites. The use of integrated management plans was also affected by unplanned initiatives in the same biological system (for example, leasing by the state of part of Fathala riverine forest in Saloum Delta Biosphere Reserve);
- The attempt to involve all stakeholders succeeded at site level. However, a lack of contact with and appropriate participation by the technical arm of OMVS, an important entity in the Senegal delta, was noted. It was only through the involvement of a majority of the other technical and political decision makers, local elected officials, NGOs and community-based organizations (CBOs), local populations and economic operators, that deficiencies of this kind could be remedied.

### 4.3 Conservation and restoration activities

Activities undertaken within the project had several purposes, the main one being to correct past errors in resource management affecting ecosystem functioning, but also to stimulate the recovery of plant communities and animal populations. Therefore:

- **In Djoudj National Park (PNOD)**, several impairments to normal functioning were observed, the most serious being the fact that inflow to the Djoudj channel itself had been disrupted by the construction of the Diama dam. Work was carried out to restore inflow to this channel. Once the problem had been resolved, plant associations reappeared; the pelican nesting island was protected from flooding during water releases; by controlling the amount of water released, it was possible to control the spread of the water lettuce. Together these changes allowed the ecosystem to recover to a nearly normal state of functioning and restored the many functions it performs;
- **In Saloum Delta Biosphere Reserve**, engineering works (i.e. the bridge over the Pendaka and the Néma Ba dam) brought the river back to almost a normal state and were instrumental in increasing water retention and significantly raising the groundwater level. This major change in the water flow regime had many beneficial effects : it revitalized plant communities including mangroves; it improved water supply to the villages and provided sufficient drinking water for livestock, thus improving the health of herds; restored once-degraded arable land and improved living conditions for local communities who are highly dependent on natural production factors. Other activities focused on the biological reconstitution of habitats, particularly in community marine protected areas. There are five of these which contributed to protecting fish populations, manatees, forest complexes with high diversity, sacred forests and fauna;
- **In Diawling National Park**, various infrastructure works were carried out, the most noteworthy being the rehabilitation of the embankments which keep water out or allow inflow when needed. This contributed to a return of good breeding conditions for fauna species and, in more general terms, to a biological enhancement of some parts of the reserve (see Figure 1).

A number of key lessons can be highlighted:

- Most of the successful initiatives either incorporated or used as their starting premise suggestions and/or corrections submitted by the local people. Resident populations have a good understanding of the prevailing conditions and the intricate functioning of the ecosystems in which they live. The programme confirmed beyond a shadow of a doubt that local knowledge, experience and aptitudes springing from the local collective memory should be taken very seriously;
- Combining the findings of technical studies with suggestions from local populations led to better results and to hydro-engineering works which will hopefully function better and be more durable;
- Previous initiatives and works which could not or decided not to ask for the local community's opinion regarding siting or side measures in road or hydraulic projects had created many problems; advice from the population helped to remedy matters;

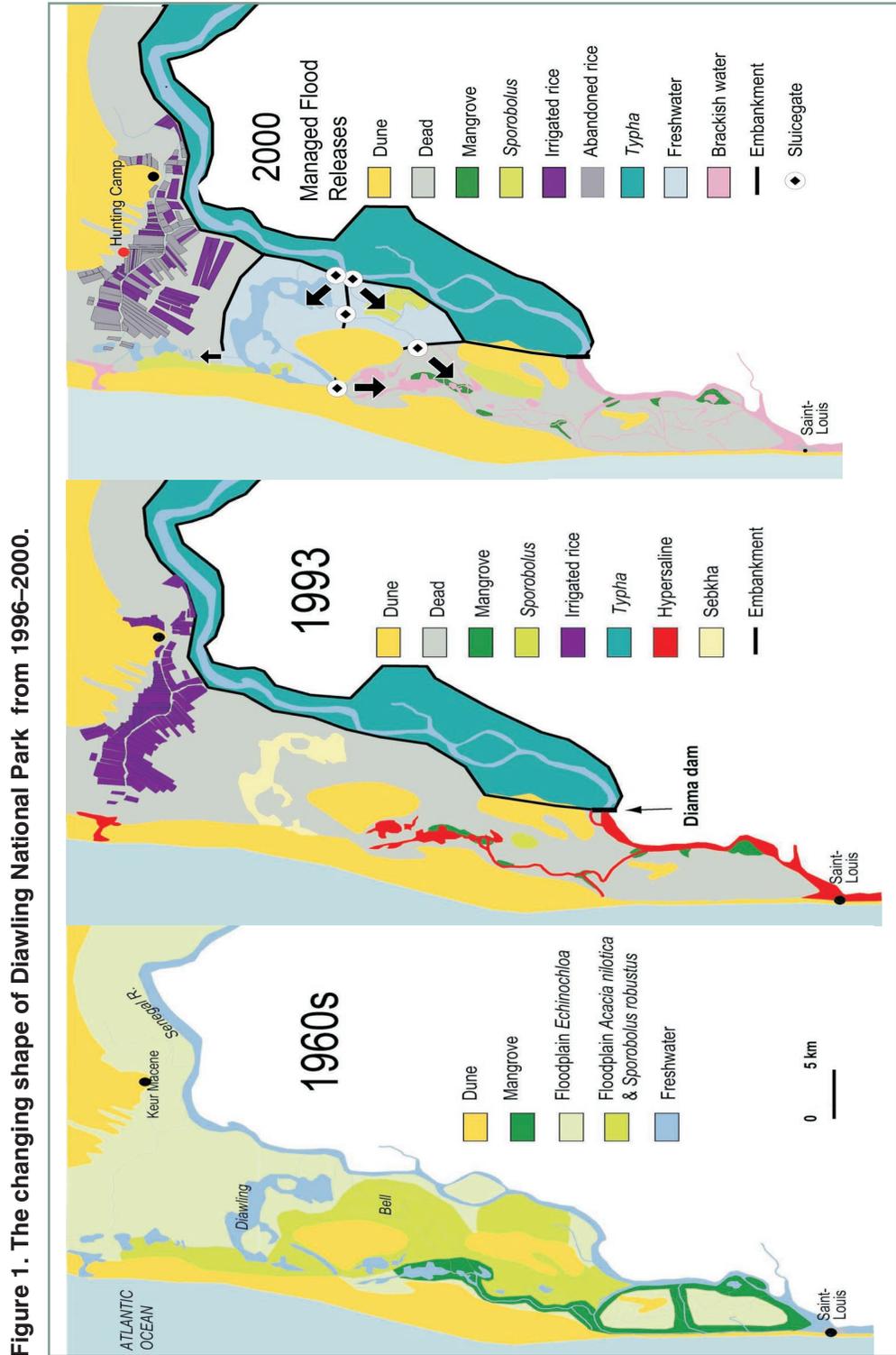


Figure 1. The changing shape of Diawling National Park from 1966–2000.

Source: Duvail and Hamerlynck.

- In wetlands, the connections between ecosystem components are very subtle and complex. They are also easily disrupted. Any work in wetlands has strong effects and consequences which must be taken into consideration, whether the changes proposed introduce new artificial elements or are aimed at correcting past errors and their consequences;
- The design of works projects affecting inflowing or outflowing watercourses must always draw heavily on extended baseline studies which address not only the consequences in hydraulic terms, but also the often far-reaching and unforeseeable consequences in ecological, human and socio-economic terms;
- Shared rules for the use of accessible resources (e.g. observing time or area closures to allow for ecological recovery, drawing up inventories of breeding areas, surveillance of beaches...) should be discussed, established and adhered to by the communities involved, and codes of conduct should be considered as a worthy and highly positive culmination of the programme's activities.
- Ecosystems requiring restoration work should be integrated into a larger area encompassing their immediate peripheral zones in a first stage, and eventually forming more extensive complexes, much like the extension of Diawling and Djoudj National Parks to form the Biosphere Reserve.

**The major wetland inventory conducted throughout the region** should be highlighted. A total of 631 sites with wetland features were counted, only about 40 of which are Ramsar sites. There is thus still great potential for future protected areas in this region.

#### 4.4 Ecodevelopment initiatives: Conservation and poverty alleviation

Conservation programmes face several major challenges, including:

- i) the difficult task of making conservation concepts relevant to local values and customs;
- ii) matching conservation activities with the livelihood concerns of populations;
- iii) the need to make changes at the interface between the human community and resources in order to ensure the sustainability of resources and processes which support life.

Conservation and development, eco-development and sustainable development were the terms used to encompass all the strategies and activities which form a general response to these challenges.

Since the Stockholm Summit on the environment (1972), the World Conservation Strategy (1980), the Brundtland report on development (1987), and the Earth Summits in Rio (1992) and Johannesburg (2002), eco-development and sustainable development have been clearly and simply defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland report, WCED, 1987). Such development should i) ensure that social progress recognises everyone's needs; ii) guarantee effective protection of the environment; iii) advocate and apply the principle of wise use of

natural resources; iv) make it possible to maintain high and stable rates of economic growth and employment.

Under the general heading of ecodevelopment, the programme's activities had to meet the criteria listed above and produce results which demonstrate that it is possible to move from theory to achieving real change in the daily lives of the population. In operational terms, the ecosystem approach is considered to be the way to attain these goals. The principles enshrined in the CBD provide useful guidance in this matter.<sup>1</sup> The programme strove to apply the principles of the ecosystem approach in several categories of activities geared toward:

- i) improving access to essential goods and services;
- ii) bringing inhabited areas out of isolation and improving communications systems;
- iii) increasing economic opportunities compatible with resource conservation and improving local finance capacity;
- iv) promoting social organization.

Further details regarding these activities can be found in Part two. The most important lessons are listed below:

- The programme developed a **methodological sequence (studying the natural and human habitats, establishing local bodies for cooperation and decision making, ascertaining requirements through MARP, synthesis and integrated planning)** in which conservation, development and sustainability are intertwined; follow-up at a later stage will be essential since it is still too early (in 2005) to accurately assess conservation and development operations;
- The populations seem to appreciate all of the **initiatives which have brought change to the natural environment**. But satisfaction always raises greater expectations and demands, all the more so since these populations had been seriously affected (including financially) by the recurring droughts. The real question is whether these communities will now be able to take matters into their own hands, and whether partner administrations are able to support them in controlling new pressures on resources. There are still issues pending regarding IUCN's withdrawal strategy and, by extension, takeover and ensuring that a minimum level of responsibility is taken on by countries and their institutions;
- **The social dimension of some interventions**, such as establishing health centres, improving village water systems, etc., was perceived as extremely important and relevant as a way of strengthening local populations and their capacity and interest in conservation. This component acted as a catalyst for changing the population's attitudes and behaviours. One aim for partner administrations is to ensure handover to relevant national bodies;
- **Microfinance** is a way of giving lasting access to the poorest members of society, mainly women, to financial services through appropriate and reliable mechanisms and facilities.

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<sup>1</sup> The 12 principles of the ecosystem approach include management of living resources: a matter of societal choice; decentralization; considering the effects of activities on adjacent or other ecosystems; potential gains stemming from managing resources for biodiversity; maintaining ecosystem services; the inclusion of ecosystem integrity; striking a balance between conservation and use; considering all forms of relevant information including indigenous and local...etc.

In the specific case of the project, ten village banks comprising a total of 500 women were set up by inhabitants of villages near the Saloum Delta Biosphere Reserve. The total amount available was over 25 million CFA francs; the funds were used to finance market gardening, processing of food products and other projects. Revenue-generating activities which benefited from a financing scheme in Djoudj National Park (*Sporobolus* mat weaving) are described in the second part of the document. In Banc d'Arguin National Park, the processing of mullet and products derived from it are common activities. Microcredit has been used regularly and has led to improvements in traditional resource use and processing practices. Product quality and profitability have both been significantly increased, thus contributing to bettering local economic conditions.

Microfinance schemes should always incorporate the aim of becoming self-sustaining and should set up the necessary mechanisms to make this possible. They must be coupled with other systems which are independent of the project but can work with it to devise ways of ensuring its continued existence. The UNCDF's<sup>2</sup> assessment of microfinance schemes states that:

- Microfinance helps the poorest families to meet their basic needs and protects them from risks;
- For low-income households, access to microfinance often means an improved standard of living and greater sustainability and higher growth rates in their undertakings;
- Microfinance encourages the involvement of women and promotes gender equity and family well-being;
- The impact is always directly related to the length of the beneficiaries' involvement in the scheme.

Analysis of initiatives within the project confirms these conclusions, especially the last point. It is all the more regrettable in this light that so few microfinance activities were possible toward the end of the project.

- The new forms of **social organization** resulting from the project are one of the surest ways of sustaining achievements in terms of applying the ecosystem approach and implementing environmentally friendly initiatives. They are also a factor in preserving a collective institutional memory. In this respect it is crucial to keep local committees and groups going.

## 4.5 Scientific contribution

Principles 11 and 12 of the ecosystem approach emphasise the contribution made by science and technology. Principle 11 states that “the ecosystem approach should consider all relevant forms of information, including scientific and indigenous information...”. Principle 12 advises that “the ecosystem approach should involve all social sectors and all relevant scientific fields”.<sup>3</sup>

Programme elements which produced a scientific contribution were i) cooperation with universities, i.e. Nouakchott, Saint-Louis, Dakar and Ouagadougou, which included hosting

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<sup>2</sup> United Nations Capital Development Fund: report on microfinance. UNCDF website.

<sup>3</sup> Hamerlynck and Duvail (2003).

graduate (master's and doctorate) students; ii) commissioning research aimed at gaining a better understanding of the ecosystems at hand (and in fact, Diawling, Djoudj and Saloum Delta parks are now better-known thanks to the programme). More specifically, our knowledge about the Senegal delta complex had to be reviewed and supplemented for the ecosystem-based restoration project; iii) the creation of wetland networks, exchange visits and other scientific cooperation initiatives; iv) effective cooperation in the use of scientific equipment installed in various programme sites (i.e. Djoudj and Diawling).

Incorporating scientific input into the project yielded a host of positive outcomes. The overall level of wetland knowledge in this part of West Africa was significantly increased, especially in the following ways:

- Greater knowledge about the ecosystems and their functioning. This was what, along with local knowledge, made remediation possible to correct ecosystem malfunctions caused by previous projects and works (Diawling, Djoudj, Lower Saloum-Nema-Pandiaka);
- Enhanced knowledge about West Africa's wetland bird fauna, including information about Palearctic migration mechanisms and the survival of Ethiopian bird populations;
- Success in controlling invasive plants, i.e. the water lettuce and, more recently, the Giant water fern, which were causing serious problems in the Senegal delta. Through a collaborative approach with other agencies based on a combination of biological and mechanical methods, their spread was halted. Here, as in many other project sites, IUCN can rightly claim that "these successful experiences in controlling invasive plants have brought technical bodies in the region into scientific and technical processes at regional and continental level and prompted the establishment of national monitoring and rapid response mechanisms";<sup>4</sup>
- Development of a regional vision. This took shape during the Regional Wetlands Programme (PRZH) period and resulted in the establishment of the Regional Coastal and Marine Conservation Programme (PRCM). Scientific research conducted by the PRZH (mullet, Saloum, Diawling, PALM, VPDI) in conjunction with a few partners (FIBA in particular) points to the web of close inter-relationships between sites which were part of the programme;
- Last, but not least, support for the establishment of training programmes at the Ecole de Faune de Garoua and the Universities of Nouakchott and Ouagadougou marked the firm anchoring of our field conservation activities in research institutes and academic institutions. This is a major step toward guaranteeing the future autonomy of the project.

To give one example where results were achieved, the approximately 30 research papers and reports produced in Mauritania, many on Diawling National Park, made an important contribution to the scientific knowledge base (see Box 1). New knowledge gained through the programme on the biology of the mullet definitely improved fishing practices; this is summed up in simplified terms in *Le mullet en Mauritanie: biologie, écologie, pêche et aménagement*. Similarly, in the Saloum delta alone, the project produced almost 30 publications on the status and ecology of the area, the dynamics of living communities (plant and animal), techniques for engaging with populations (MARP), issues in land improvement for saline areas and the restoration of "tanns" (areas affected by soil salinization), etc. (see Box 1).

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<sup>4</sup> IUCN Intersessional Programme.

**Box 1. The Programme's contribution to science: An extensive and impressive catalogue**

Through the work of its teams, in collaboration with scientific research institutions and university institutes, and through support to Master's and PhD students, the programme generated a large body of information and documents which strengthen the knowledge base on wetland resources management. The scientific and technical output of the programme, both in terms of published and grey literature, is truly impressive. The following highlights regarding sites in Mauritania and Saloum Delta Biosphere Reserve give a good idea of the overall contribution made.

**In Mauritania**, and particularly in Diawling National Park, a large number of research papers and theses specifically address the scientific and technical aspects of the programme. Some thirty publications have been written on the following topics:

- Plants – Five studies on topics including distribution, mapping and soil/plant interactions. Some project support was allocated to research on sites located outside the geographical area of the programme;
- Resource planning and economics – Eight papers and reports on subjects such as using the ecosystem approach in restoration work in the Senegal delta, the contribution of remote sensing to analysing and managing environmental risks at Lake Aleg, zoning and the management plan in Diawling National Park, etc;
- Water resources and hydrology – Five research studies and reports on the hydrology of Diawling National Park, a survey of water resources along the Mauritanian coast, a case study of Lake Mal, and workshop proceedings. All of these were sources of essential information;
- The environment and sustainable development in context – including four papers on the impact of park management actions on the local social and human situation, and capacity building in this field;
- Programme management aspects and similar topics are also reviewed in at least five publications (planning, project review, data analysis and management).

**Saloum Delta Biosphere Reserve** was the focus of 27 research papers and reports on areas such as:

- Land use and mapping (including three contributions on land-use maps and a geographical information system study of the Reserve) and management options for the protected area;
- Plant resources (a publication on flora and woody vegetation in the reserve (RBDS), changes in habitats from 1971 to 1996;
- Fauna resources, including large mammals, birds and fish, with at least eight items on large and medium-sized animal species, bird censuses, large mammal surveys, a contribution on the general management of the reserve;

Cont.

**Box 1. The Programme's contribution to science: An extensive and impressive catalogue (cont.)**

- Programme planning and design, dealt with in four documents;
- The participatory approach and traditional knowledge, addressed by four publications which refer to the people's intimate knowledge of and interactions with their environment, and an exploration of the participatory approach;
- Knowledge about and valuation of fisheries products, etc.

There is also a wide range of documents of a more general nature, including:

A series of progress reports

a. Phase III: 1996–1999

- Annual and biannual reports nos. 1–7
- End of phase reports
- Evaluation report, 1999
- Training course report: Potential and problems in wetland management, 1999
- Training course report: Wetland management, 1999

b. Phase IV: 2000–2004

- Annual and biannual reports nos. 1–10
- External evaluation report, 2003
- Reports of scientific committee meetings: 2002, 2003 and 2004
- Reports of steering committee meetings: 2002, 2003 and 2004
- Conferences:
  - Proceedings of the Yamoussokro conference, 1999
  - Report of the Bamako conference, 2002
  - Report of the Niamey conference on “Conservation and development: a dilemma”, 2003
  - Report of the Kompienga forum, 2002
- Training courses
  - Report on course entitled “The socio-economic aspects of wetlands”, 2001
  - Report on course entitled “Cultural values and the legal aspects of wetland management”, 2002
  - Report of course entitled “Wetlands and water”, 2003
- Wetland inventory reports for twelve countries: Benin, Burkina Faso, Gambia, Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Togo.

Cont.

**Box 1. The Programme's contribution to science: An extensive and impressive catalogue (cont.)**

- Other publications such as:
  - Ouadba, M. and Lamizana, B., 1999. Problématique de la gestion des eaux dans la vallée du Kou au Burkina Faso. In: *Report of the Thirteenth GBF*, 1999. San Jose, Costa Rica.
  - Lamizana, B., 2003. Good agricultural practice: the Karral dry season cultivation in the northern Cameroon. In: *International Journal of Ecology and Environmental Sciences* **29**. International Scientific Publications, New Delhi.

A number of papers were also delivered orally during conferences organized by the programme.

## 4.6 Indirect effects

One purpose of regional programmes is to raise awareness about a given issue and catalyse the development of policy and strategies for action. Project activities at a regional level also produce mutual motivation between counterparts, and one country's experience can assist another in terms of using political, institutional and programmatic measures to make progress across the entire sector. The Regional Wetlands Programme did not depart from this tradition. It can be credited, directly or indirectly, with the following achievements, among the longer list of goals attained in participating countries throughout the region.

- *Motivating member countries to more actively implement the Ramsar Convention and to designate protected areas for inclusion in major networks:* By contributing to more integrated management of sites which are already valuable protected areas, the programme made it easier for countries to designate or maintain sites in appropriate conservation (Biosphere Reserves) or wetland (Ramsar Convention) networks. Djoudj and Diawling National Parks are already recognised individually, but their joint participation in the programme had the effect of promoting conservation in the entire Senegal delta, with the likely outcome being the establishment of a transboundary biosphere reserve. Saloum Delta Biosphere Reserve also benefited from the gradual introduction of socio-economic measures and habitat restoration work in its peripheral area and strict protection in its core area; these are precisely the characteristics to be sought in a biosphere reserve located in a populated and pressure-ridden area like Niombato.
- *Promotion of wetland conservation policies and strategies:* At both national and sub-regional levels, the regional wetlands programme stimulated awareness and gave impetus to wetland conservation and resource development action. Environment ministers, members of parliament, academics and scientists, river basin authorities and NGOs met frequently. Local regulations, codes of conduct and local groups came into existence and began to shape political and strategic thinking on wetlands (i.e. the pilot consultation on the sustainable management of Sahelian floodplains, from 1990–2000; the Conference on the proper management of large dams, 2001; the Conference on wetland inventories, 2003; National expert networks; the twinning of Diawling and Djoudj National Parks in

July 2003...). The first signs of national policies and strategies are beginning to emerge in every country in the sub-region.

- *Progression of the wetlands programme in West African countries not covered by the project:* Real progress can be seen in Burkina Faso, Gambia, Ghana, Mali, Chad, etc. This is to some extent the result of progress made toward previously mentioned goals. The programme's efforts to promote and raise popular awareness have paid off, leading to a higher priority being given to wetlands in environmental planning by sub-regional organizations and to greater attention being paid by river basin authorities (such as OMVS) and NEPAD to the preparation of an environmental action plan for West Africa.
- *The development of regional institutions and cross-border cooperation:* National dynamics and exchanges made possible by the programme were factors in:
  - i) the establishment of the regional wetlands network, including interfacing with the work of the Ramsar Convention Secretariat, Wetlands International, OMVS and ABN;
  - ii) plans for a transboundary biosphere reserve in the Senegal delta;
  - iii) the foundation of the regional wetlands centre based in Ghana;
  - iv) the greater importance now attached to wetlands in general in all initiatives and bodies which rely on regional cooperation (CILSS – The Permanent Interstate Committee for Drought Control in the Sahel, WAEMU – West African Economic and Monetary Union, ECOWAS, NEPAD and river basin authorities).

## **5. Errors and shortcomings – lessons learned**

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There is no such thing as perfection and even the best-designed and most successful projects are fraught with errors and flaws. Overlooking these or minimizing their importance can mean ignoring valuable lessons that could serve future initiatives well. The second part of this report presents a critical review of the programme. This chapter merely highlights and reviews a few weak points noted by the programme team and the evaluation reports of all phases, from design to implementation and follow-up.

### **5.1 Conceptual or operational deficiencies**

#### **Giving responsibility for project management to local populations during implementation and collaboration with local administrations**

“We were able to take advantage of local knowledge and use community leaders to assimilate it into our approaches and activities, but the projects were unable to reciprocate by allowing the population to manage the ecosystems...”. This critical remark was made by a member of the IUCN team who qualified it by saying that sometimes “it is the national institutions that don’t play the game by not following up on initiatives launched by the population.” Here we face the typical case where the social approaches advocated by project and implementing agencies alike are not always adopted by government departments. In some countries, responsibility for natural resource management is not decentralized in practice, and often not even in the legislation.

#### **Giving responsibility to national partners**

In some instances, buy-in to the project’s approach and practices by national managing staff was weak; the consequence was that the population did not adopt the project fully as its own. In addition to the legal and administrative factors mentioned above, the fact that government staff are frequently transferred, a practice which is criticised in the analytical section, also had an impact. It seems clear that some national officials misjudged the importance of having a stable and properly-trained staff assigned to implementation. In projects of strategic importance, staff should be assigned in a medium-term perspective at the least, and preferably long-term if the aim is to achieve deep-rooted and lasting results.

#### **Devising a withdrawal strategy**

The withdrawal phase of the programme could have been better prepared, especially as concerns the continued performance of certain tasks by the communities. The intention is to ensure that populations have the capacity needed to maintain infrastructure and manage ecosystems after the project team’s departure. At the time this report was being written, the project was not yet completely finished; it may therefore be slightly too early to attempt to

objectively assess how well the populations (or technical departments) took over certain responsibilities. We do believe, however, that the beneficiaries do not yet have sufficient financial resources to do so, which begs the question of how sustainable our achievements in the field will be.

### **An atypical case: the Doris pirogues of Diawling National Park**

The story of the Doris *pirogues* in Diawling National Park seems like a major departure from the general approach taken by the project. The people of Walo, who live on both sides of the border between Senegal and Mauritania, are fishermen. Their area is full of coastal fishermen and shipbuilders specialized in the type of vessel they traditionally use. The programme, however, decided to provide them with pirogues built according to a French design, although the assembly was to take place on site under the supervision of an expatriate carpenter. The case was a typical one inasmuch as the technical assistance was conventional and the equipment, materials, skills and know-how right down to the simplest practices were brought in from the outside. Before leaving the site, the technical assistance personnel gave orders for maintenance and minor repairs and left some materials behind for that purpose. Barely two years later the pirogues, which were built to last for 20 years, are all out of commission and would require major repairs to run again. The situation is the cumulative result of a series of mistakes in i) the design and materials used to build the boats; ii) the assignment of responsibility for managing materials and equipment; iii) training a sufficiently strong and committed takeover team; iv) the consideration which should be given to indigenous know-how and willingness to help.

### **Sociology, communication and participation**

Partial or comprehensive evaluation reports maintain that despite substantial effort, the three-pronged strategy for sociology, communication and participation never achieved optimum effect. It is felt that although the sub-region as a whole is quite advanced in this area, the project did not manage to capitalize on the general level of progress. This is apparently due not to a flaw in design, but to a lack of conviction by national counterparts, at least at the beginning of the programme. Much was learned along the way, but the major question now is how to sustain a participatory approach based on steady social progress, and on communication tools and approaches which use and adapt to the rapid developments in the sector. On the communication front, an effort must be made to engage sceptical or noncommittal parties whose cooperation is essential to the management and conservation of wetlands: regional development agencies, river basin authorities and technical agencies outside the main group of conservation partners.

## **5.2 Unresolved issues**

### **Consolidating, strengthening and sustaining mechanisms established**

One of the outcomes the project can be proud of is the establishment and operating of wetland conservation and management bodies, even if some are still informal. Their continued existence and operation will depend greatly on takeover by national actors. Whatever happens, it will be important to include a general component on protecting achievements in future

cooperation programmes, lest they run the risk of losing the ground gained with great difficulty by national and cooperating partners.

### **The survival outlook for networks**

As they are still fairly young, have limited experience and only a few institutions which can provide them with funding and technical assistance, it is still unsure whether the networks created by the project will be able to function and survive on their own. The institutions assisting them should formulate practical strategies to support them in view of the excellent work they are doing. The upstream partnership between IUCN, Wetlands International, the Ramsar Convention and others, in conjunction with national institutions, must maintain its individual and collective presence and impetus in order to sustain the intensity and perpetuate the momentum created. Fortunately, the majority of the members of the regional and national networks are gradually joining IUCN Commissions. However, some networks have great difficulty publishing their results, even though a part of the funding needed is available. Volunteer work is at once a strength and a weakness for the networks. A network's performance depends mainly on the motivation of its leaders, and as volunteers they are not officially accountable.

### **Perpetuating and spreading good conservation habits**

Many types of resource use and management have been improved and/or submitted to local populations and been accepted and refined by them: continuing the practice of time/area closures, making the use of good practices for *Sporobolus* harvesting a permanent fixture, continuing to manage shrimp migration and breeding processes, etc. These measures are still young and fragile, and it is of the utmost importance to maintain an institutional climate of support and public information to sustain such practices. This is the major challenge that national administrations will have to face.



**Part two:**

**A detailed account of the  
Programme's achievements and lessons  
drawn from the experience**



# 1. Introduction to the Regional Wetland Programme

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## 1.1 Historical background

In West Africa, and in Sahelian countries in particular, the 1970s and 1980s were decades of severe rainfall shortages. In the Senegal river delta, average rainfall declined steeply by around 35% between 1950–1970 and 1970–1990.<sup>1</sup> Similarly, in the Saloum delta, rainfall figures dropped by some 30% in the 1980s and 90s. On a country-wide scale, isohyets in Senegal shifted by approximately 200km. Throughout the region they moved south: 300km in Niger for the 250mm isohyet and 120km in Burkina Faso for the 500mm isohyet.

The general reduction in rainfall had an impact on the hydrological regime of the large rivers in the region, on the functioning of floodplains and the status of their resources and, by extension, on agricultural activities and production. The consequences of this adverse climatic change on Sahelian wetlands were exacerbated by certain forms of use and by the impact of some human settlements (construction of hydroagricultural works, embankments, makeshift infrastructures...) as well as by demographic growth. The ripple effect of these phenomena could only speed up resource degradation.

The increased fragility of Sahelian ecosystems caused by recurring drought was all the more alarming in that the technical and financial means to reverse the trend were unavailable in most of the countries affected. Although for decades most states, like those involved in this project, already had official bodies responsible for natural resource management (Water and Forestry and/or National Parks Departments), the traditionally upheld approach entailing strict protection of resources was no longer valid. A glaring need for technical, financial and methodological support had emerged as an absolute prerequisite for sustainable restoration and conservation of wetland ecosystems. Actually, the concept of wetlands was as yet only vaguely familiar, if at all, to most technicians. As for the vision of integrated resource management which would take all types of use into consideration and also emphasise the importance of preserving nature, it was not widely shared, to say the least.

The other major reason for IUCN's interest in the region is that paradoxically, while West Africa is essentially an arid region, it has an untold wealth of wetlands and water resources. The extensive wetland complexes of the Sahel (the inner Niger delta, Lake Chad, the Senegal delta, Gulf d'Arguin, etc.) are areas where human populations converge, and as such they are the theatre for both socio-economic activities and environmental concerns.

IUCN became active in West Africa in the mid-1980s, using funding from the government of the Netherlands to put its know-how at the disposal of the region and thus contribute to improving the management of ecosystems threatened by degradation. In 1989, IUCN established a regional wetlands programme spanning five countries: Burkina Faso, Mali, Mauritania, Niger and Senegal.

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<sup>1</sup> Average rainfall recorded in Rosso fell from 304mm for 1950–1970 to 199mm for 1970–1990. For the same period, averages in St Louis were 313mm and 219mm respectively (Duvail, 2003).

The programme was not launched at the same time in all five countries. Work did not begin in Burkina Faso and Mali until 1994. The reason for this delay was “the decentralized operating mode of Netherlands development cooperation”<sup>72</sup> which gives each embassy considerable freedom to formulate its own approaches and set up its own networks of partners, within the limits of the official development and conservation policy objectives and guidelines of the Netherlands. The programme could not be initiated in Niger because the country is not part of the Netherlands Development Cooperation Agency’s focal area.

The first programme activities in Mauritania began in 1989:

- i) support to the “Lanches” project, a traditional shipbuilding project in Banc d’Arguin National Park; the International Foundation for the Banc d’Arguin (FIBA) was given the lead role in implementation;
- ii) support to the initial studies on the Diawling, as part of the preparatory phase in the establishment of Diawling National Park, which became a reality in 1999. First the protected area was delineated (phase I), then the management and development plan was drawn up (phase II) and implemented (phase III). The need to monitor and provide greater support and assistance to this process, along with the emergence of other issues of conservation interest (i.e. the mullet), and lessons learned from the preceding stage prompted IUCN to open a Liaison Office in Mauritania (phase IV). The office is responsible for supporting the implementation of the Wetlands Programme in Mauritania. The programme has activities on three sites and also works on the management of the mullet, a vulnerable resource.

IUCN’s relationship with Senegal dates back to the mid-1980s. A regional office had been opened in Dakar to coordinate IUCN’s activities in West Africa. Subsequently, the office was closed and replaced by an IUCN Mission in Senegal. A Senegalese director was appointed in accordance with IUCN’s official selection procedure. The agreement reached in this matter was the beginning of a period of more constructive dialogue with Senegal. It was in this new and productive atmosphere that the process of drafting the first integrated management plan for Djoudj National Park was launched in 1994. The success of the plan led IUCN and the Senegalese authorities to provide Saloum Delta Biosphere Reserve with a management plan, preparatory studies for which began in 1999.

## **1.2 Programme components**

The specific operational objectives are the following:

- improve management of key wetlands for biodiversity conservation in the region;
- demonstrate that the wise use of wetlands can contribute to the well-being of rural communities which depend on them for their livelihoods;
- disseminate information on wetland conservation and integrated management;
- promote increased technical and financial investment conducive to the conservation and integrated management of West African wetlands.

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<sup>2</sup> Report of the external evaluation mission (February, 1999).

A list of Programme components in each country is given below (see Figure 2):

**In Mauritania:**

- protected area management (Diawling National Park – PND and Banc d’Arguin – PNBA);
- support to the informal network of experts on wetland management;
- support for the preparation and implementation of the development plan for the Mauritanian Coast (PALM);
- implementation of a “mullet conservation and sustainable use project in Mauritania and in neighbouring countries”;
- contributing to improving university teaching in the fields of water management and aquatic ecosystems.

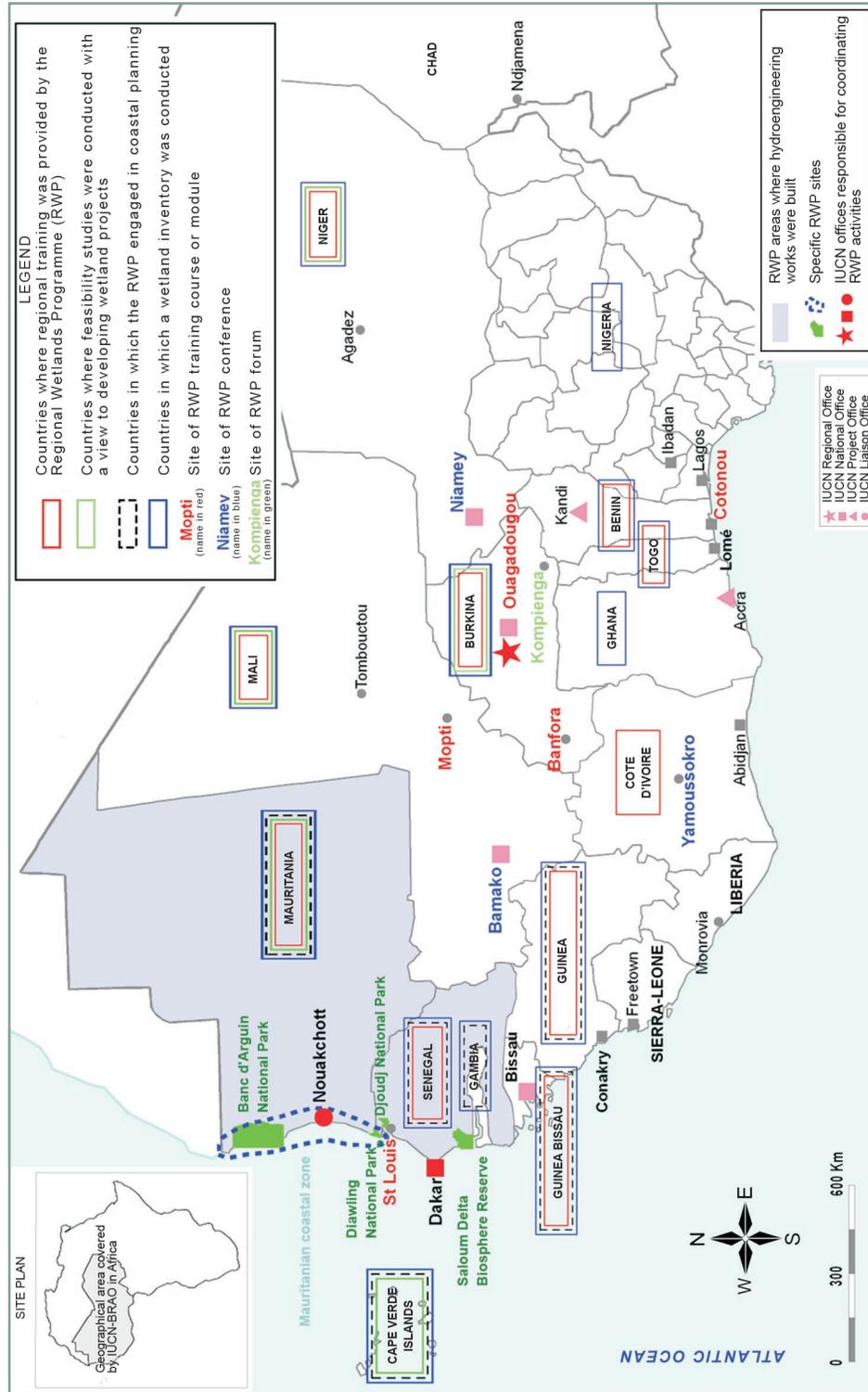
**In Senegal:**

- management of Djoudj National Park (PNOD) and Saloum Delta Biosphere Reserve (RBDS);
- support to the work of the National Wetlands Network (RENZOH).

**Regional-level activities include:**

- training projects intended for wetland managers and decision makers;
- awareness and information;
- promoting training and exchanges in areas such as the participatory approach, shared river basin management, coastal planning;
- support to regional networks (Sahelian Wetlands Expert Group – SAWEG and coastal planning network);
- institutional support for university training and research in the fields of wetland development and management.

Figure 2. Sites and areas covered by the Programme.



## 2. Programme achievements

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The programme made a number of achievements in ecosystem restoration and conservation, ecodevelopment, knowledge generation and dissemination.

### 2.1 Restoration

The severely degraded state of resources following changes in climatic and socio-economic conditions in the Sahel in the 1970s and 1980s prompted IUCN and its partners to make habitat restoration one of the central aims of the regional programme. In Mauritania and Senegal, major funding was allocated to restoring hydrological systems and ecosystems in the lower Senegal delta, along with several hydrological features in the Saloum delta.

**In Diawling National Park** (Figure 3), OMVS and IUCN put in place a series of structures which partition the lower delta into three basins: Bell (water inflow and outflow are completely controlled), Diawling (connected to Chat Boul) and Ntiallakh (connected to the sea via the downstream section of the Senegal river) (Duvail, 2003). Bell 1, Bell 2, Lemer 1, Lemer 2, Cheyal sluice-gates and the embankment on the right bank were built by OMVS as part of its programme for the hydrological management of the Senegal river. The programme was also responsible for building Lekser and Berbar sluice-gates and three embankments; Lekser embankment, the embankment between Ziré Takhrédient dune and the coastal dune (which is used as a road), and the unfinished northern embankment separating Bell basin from Diawling basin.

Using this system of sluice-gates and embankments, it was possible to recreate the estuary by artificially managing water inflow and outflow in Diawling basin. For purposes of good management, a consultative model for supplying water to the three basins was added. The parties involved agreed on a hydrological calendar which sets the dates for opening and closing the sluice-gates, and for regulated flows which take several factors into account – vegetation growth stages, fish movements and the need to protect hydraulic infrastructure.

The equipment installed and the hydrological management model thus contributed to the gradual restoration of the ecosystem in the lower Mauritanian delta. The results observed in and around Diawling National Park (PND) by the external evaluation mission in 1999 (UICN, 1999) were subsequently confirmed by Duvail in 2003. The greening of the landscape is striking in all three basins. The shrub storey is developing. The use of *Tamarix* to prevent erosion on the edges of the embankments has been successful. In the tree storey, *Acacia nilotica* and *Acacia tortilis* are making a good comeback on Ziré dune and the coastal dune. The mangrove forest in the confluence area is also showing strong signs of densification. Some 3,000ha of rehabilitated pastureland have been opened for grazing.

In the grassy layer, however, species of low nutritional value for grazing (Cyperaceae) are supplanting species of high economic value such as *Echinochloa colona* (grazing) and *Sporobolus robustus* (used to weave mats). There seems to be a correlation between this phenomenon and flood parameters (duration and maximum water depth) according to Duvail (2003).



When the Giant water fern (*Salvinia molesta*) was accidentally introduced in the lower Senegal delta in July, 1999, IUCN, ever committed to maintaining healthy ecosystems, reacted immediately. An emergency meeting of the relevant agencies of both countries was convened in order to explain the risks involved and draft an action plan. The leading officials of OMVS were informed of the situation. IUCN's national and international networks were alerted. This is how, only ten months after the first sighting of the species, heads of state, ministers and the army chiefs of staff had become involved. The highest authorities in Senegal understood the message so well that they called out the army corps of engineers to mechanically clear the channels leading to irrigated fields.

It quickly became clear to IUCN and its national and international expert groups that biological control was the alternative of choice. *Cirtobagus salviniae*, the natural enemy of the target species, was imported from South Africa and introduced in the delta in compliance with internationally recognised standards. Similar operations were conducted by FAO. The threat posed by *Salvinia* gradually diminished and has now disappeared; the natural balance between the Giant water fern and its enemy species seems to have been achieved.

Had it not been for this rapid response and for the flexibility of the donor agency (DGIS) in agreeing to allow reallocation of funding, the damage caused by *Salvinia* would surely have been much greater.

A number of other results are more limited in time or scope but have nonetheless produced definite ecological and economic effects. The consultative approach, an option integrated into the park's management plan, was a factor in achieving the following results:

- Fish and shrimp populations, which were heavily impacted by the hypersaline conditions prevailing when the work began, now occur in large numbers in their typical habitats.
- The recharge of the groundwater table has been confirmed and market gardening has resumed i.e. on Birette and Ziré Takhredient dunes.
- The management plan took responsibility for hydraulic infrastructure works in the protected area to offset the adverse impacts of the OMVS project, in response to the suggestion made in the environmental impact assessment for the Diama dam project, carried out in 1980 by Gannet *et al.* (Duvail, 2001).
- The estuary has been recreated artificially according to proposals by the local populations based on their empirical knowledge of the area.
- The natural regrowth of vegetation stands was aided by the building of exclosures. At the *poste du carrefour* (crossroads warden station), an exclosure was built for demonstration and teaching purposes. The success of the operation was copied by other projects, i.e. north of Ziré Takhredient (5ha) and north of Kaharra (6ha).
- Following a combined process of information, awareness raising for stakeholders (public authorities, researchers, the population, international institutions, etc.) and the development of synergy between the actions of PND, IUCN, the University of Nouakchott and other programmes (OMVS), real success was achieved in the biological control of *Salvinia molesta*.

**In Djoudj National Park**, the main concern was improving the functioning of the hydrological system. The existing sluice-gates (Djoudj, Crocodile, Gorom) had been engineered by the Senegal River Development Mission (Mission d'Aménagement du Fleuve Sénégal – MAS) and the Company for the Hydrological Development of the Delta (Société d'Aménagement des Eaux du Delta – SAED) in the early 1960s as part of the irrigated rice growing programme. The remedial work mainly consisted of dredging the canals and building small embankments to allow water in individual plots to be managed separately.

The main outcomes of the project were:

- The renewed vegetation dynamic, with high species diversity reflecting submersion periods, salinity levels and water depth: *Phragmites vulgaris* appeared on the banks of the Djoudj and lake Khar, *Tamarix senegalensis*, *Salvadora persica* and *Acacia nilotica* on the banks of the Djoudj, the Gorom and lake Khar, *Scirpus littoralis* and *Sporobolus robustus* on the banks of Grand Lac, etc;
- The reappearance of some mammal species (the Dama gazelle in Gnith sector) and an increase in numbers for others (crocodile, warthog, red monkey);
- Successful control of *Salvinia molesta* and *Pistia stratiotes* through combined use of biological and mechanical methods. The *Salvinia molesta* control programme was initially designed and launched following information and awareness campaigns targeting all stakeholders (public authorities, local governments, researchers, local populations, the press, NGOs, private users of the Djoudj, international organizations). A kind of coalition against the invasive species emerged out of this campaign. A programme of mechanical *Salvinia* control coordinated by the office of the President of Senegal and encompassing all stakeholders was launched. It was rounded off by a biological control programme coordinated by the IUCN programme;
- The improvement and maintenance of the park's hydrological system: such work is regularly included in the implementation programme of the annual management plan. The management committee, comprising the head warden, the IUCN representative and representatives of the local community, decides what type of action is called for. The annual programme is then validated, first by the scientific committee and then by the steering committee.

**In the Saloum delta**, two engineering projects were implemented: the dam on the Nema, whose bed had dried out, and Pandaka bridge. These projects, which restored hydrological conditions in the area, resulted in:

- The return of various species to the Nema valley: the crocodile, formerly very rare, and Palearctic and Ethiopian bird species such as flamingos, pelicans and waders, etc;
- The resumption of estuarine fish migrations after the rehabilitation of Pandaka *bolon*;
- The resurgence of freshwater at points along the valley following groundwater recharge.

Suggestions for both the dam and the bridge originally came out of the participatory baseline assessment exercise carried out when the RBDS management plan was being drawn up, and the reserve subsequently decided to carry out the work. With the dam in place, it is possible to flood low-lying areas for longer periods, thus lowering salinity levels and ensuring greater availability of freshwater. The bridge re-established the conditions needed for estuarine fish migrations.

The construction work was carried out with funding from the Netherlands and contributions in kind from the local populations (sand, pebbles, water and labour). A dam management committee of 15 members is responsible for enforcing the rules set by the population (dates for opening/closing sluice-gates, prohibition of polluting activities such as laundering clothes and swimming, etc.).

## 2.2 Conservation

The overall decline in rainfall that has affected the Sahel in recent years has left the ecosystems fragile. It has also led to an increased demand for all types of resources, but above all for land, plant and animal resources. The strategy which hinges entirely on strict nature protection has proved to be inadequate. Therefore, in addition to restoring natural habitats and their production capacity, an approach which combines conservation with activities to promote sustainable resource use must be advocated. The programme and its partners have embarked on this path via the development and implementation of an integrated management plan.

The integrated management plan is part of an innovative approach which reconciles conservation and development. In general terms, the plan rests on two strategic pillars: site activities and capacity building for stakeholders. The main components of the management plan are:

- Biodiversity conservation;
- Applying the principles of the integrated approach;
- Participation by local populations in resource management;
- Institutional support.

In Mauritania and Senegal, implementation of the integrated management plan contributed to:

- Creating or restoring protected areas (Diawling, Djoudj and Saloum Delta...);
- Setting up participatory mechanisms for resource management and development (management committee, steering committee in Djoudj National Park, advisory committee on the mullet, etc.);
- Bringing research into various stages of the management plan: drafting, implementation, monitoring/evaluation (scientific committee in the Djoudj and in Saloum Delta Biosphere Reserve, research contracts between the mullet project and the Mauritanian Oceanographic and Fisheries Research Institute (IMROP), and between Djoudj National Park and GREZOH, etc.).

The process for designing the management plan was both iterative and interactive and comprised the following stages: information and awareness (positive activism, broad range of contacts), participatory baseline assessment, selection of partners, planning the actions chosen, defining management and monitoring & evaluation mechanisms.

The mullet project provides a good illustration of the process, as it was designed and carried out according to a participatory development and joint management approach. The first seeds of the project were sown when the Ministry of Fisheries and the Maritime Economy (MPEM),

IUCN, FIBA and PNBA came together to decide how to proceed. Sectoral meetings were then organized in April, 1999. Three working groups met separately, each being set the task of stating its own concerns and expectations.

The process culminated in a round table discussion including all parties. This produced one extremely important result: the participants made the connection between good communication among themselves and sustainable use of the resource. This consensus was the basis for one of the mullet project's aims: support the establishment and operation of an advisory body in which all stakeholders in the mullet fishery can have a say. This conclusion adopted at the 1999 meeting thus validated one of the basic assumptions of the strategy set out by the mission to support the development of the mullet project. These processes were co-sponsored by IUCN and the International Foundation for the Banc d'Arguin (FIBA).

For the purposes of hydrological monitoring, instruments to measure water levels were installed as part of the implementation of the integrated management plans. In Djoudj and Diawling parks, limnimetric scales and automatic water level measuring stations were placed at selected points in the depressions and basins (Cheyal and Lemer for the Diawling National Park; Crocodile, Khar, Grand Lac, landing stage, and the Djoudj *marigot* (marshes) in Djoudj National Park).

The annual bird count which takes place on January 15 is incorporated into the parks' and reserves' management systems. It provides managers with:

- Essential information for setting up a database on bird migrations (numbers, species composition, fluctuations, etc.);
- Indicators of the relationship between the condition of the ecosystem and migration dynamics.

Through the management plans, tools for storing, processing and analysing information generated at site level are available. These were chiefly GIS – Geographic Information Systems and observatories for monitoring ecological and socioeconomic trends, and data on the spatial distribution of certain variables relevant for conservation. PALM, for example, monitors coastal erosion trends using a GIS linked to an observatory. The process of implementing the management plans also produced methods, organizational systems and tools for ecological and socio-economic monitoring.

## **2.3 Ecodevelopment**

The ecodevelopment component contained in the management plans was designed partly in response to the wishes expressed by the communities living near protected areas, and partly as a way of raising their interest in joining conservation activities. All of the activities and measures taken to promote ecodevelopment are aimed at counterbalancing the loss of income caused by regulations which restrict access to resources. Above and beyond ecological considerations, there is a need to restore equity for populations who willingly sacrifice their resource use rights despite being the legitimate beneficiaries. This strategy is also built on our conviction that there should be a direct relationship between the population's commitment to conservation and the benefits they derive from it. The ecodevelopment component comprises a number of activities in the fields listed below.

## Microfinance

The provision of a modest level of funding can lift the strategic barriers to communities' participation in local development activities. Microfinance is useful from this perspective. The programme undertook to organize microfinance schemes consisting of village banks at most project sites. Villages in the vicinity of the protected areas were the beneficiaries.

Loans are granted on a zero-interest basis. Rules regarding eligibility, repayment, penalties, etc. are established by the members of the cooperative or village group. They are then validated by the management committee for the plan. Loans are used to finance income-generating activities: crafts (*Sporobolus* mats woven by the women of the Djoudj), market gardening (Diawling, Saloum Delta Biosphere Reserve), trade (sale of mullet products by Imraguen women, etc.). The scheme has significantly contributed to generating substantial levels of income in villages located around protected areas.

The microfinance scheme was accompanied by training for the beneficiaries in financial management and techniques to ensure the products would be competitive on the market (marketing techniques for processed mullet products, improved processing techniques for fisheries products in Saloum Delta Biosphere Reserve).

The outcome of the microfinance segment of the programme was satisfying both in terms of buy-in by communities (in Saloum Delta Biosphere Reserve, 500 women run 10 village banks with funds of over 25 million CFA francs) and how effectively it functioned. Loans granted under the three-year integrated management plan (PTGI) are always repaid in full. The people realized that the system had to be sustainable and asked for the savings facilities to be gradually shifted to a mutual bank structure or a savings and loan cooperative. Their request goes to show just how strongly they believe in the system.

## Health

The plan has improved access to quality healthcare by building health centres or donating equipment for them. In Djoudj park, for example, the health centre was entirely renovated by IUCN and receives regular deliveries of medicines as well as logistic support.

## Ecotourism

Some of the aims and characteristics of ecotourism are: showcasing pristine or nearly pristine landscapes while showing respect for the areas visited; seeking, promoting and equitably rewarding the participation of the human populations in the economic activities conducted in ecotourism areas, and generating social benefits. In this spirit, training sessions were offered and equipment was provided to village producers to enable them to better enter certain niche markets in the developing field of tourism. The most noteworthy actions are:

- The promotion of products symbolising local culture (crafts shop or Boutikbi in Djoudj National Park, sale of small wooden models of sailing boats in Banc d'Arguin National Park, etc.);
- Offering local services for sale (boat excursions on the Banc d'Arguin, *pirogue* tours in Djoudj park, accommodation in the village camp in Djoudj park, etc.).

## Improving the water supply in neighbouring villages

Access to drinking water is a major concern for most villages located around protected areas. Despite the proximity of wetlands, water for drinking and domestic use is difficult to obtain due to their isolation and, in coastal areas and on islands, to the rapid upsurge of brackish water. The ecodevelopment component sought to find a response through a variety of measures.

- In the area surrounding Djoudj National Park, the water supply was a concern expressed by villages. The programme's response evolved over three phases: i) the hauling of water in carts, ii) the purchasing of a tank truck and finally iii) the construction of water towers fitted with generator engines and the installation of street fountains in several villages;
- 48 wells were built in the core area of Saloum Delta Biosphere Reserve.

## 2.4 Knowledge generation and dissemination

**Research** is considered to be a strategic tool for site and resource management. It adds to the knowledge base on wetland resources. It should also provide answers to questions that conservation technicians ask themselves as they go about their work. How well did the IUCN programme meet these two requirements?

A great deal of research was conducted **in the wetlands of the lower Senegal delta** with a view to better understanding the major changes impacting habitats, biodiversity and land cover and use features. The findings represent a considerable improvement in the state of our knowledge on wetland ecosystem biodiversity in this area.

Surveys carried out in Diawling National Park and its peripheral area recorded the following data in 1998:

- birds: 174 species and 138,000 individuals, 80% of which are migratory;
- plants: 128 species, 35 woody species and 95 grasses;
- fisheries resources: 97 species, 37 freshwater and 60 estuarine;
- terrestrial mammals: jackals (*Thos aureus anthus*), Patas monkeys (*Erythrocebus patas*), wild cats (*Felis* sp.), warthogs (*Phacochoerus porcus*)...etc.

**In Saloum Delta Biosphere Reserve**, 17 research projects covering different fields were conducted, and inventory methods were developed. The work generated a body of in-depth knowledge about the site's biophysical and socio-economic environment. Censuses recorded the following figures:

- 21 species of large and medium-sized wild vertebrates (25 if one counts non-standard observations) which include the Sitatunga (*Tragelaphus spekei*), the Spotted hyena (*Crocuta crocuta*), the warthog (*Phacochoerus porcus*), the bushbuck (*Tragelaphus scriptus*), the Red colobus (*Colobus badius*), etc;
- 188 woody plant species (9% of all species occurring in Senegal) representing 50 families (30% of plant families in Senegal);
- 167,002 waterbirds, of which 107,307 were waders; this is 64% of all waterbirds occurring in the reserve (95 species, 31 of which are waders).

The wader monitoring programme made it possible to:

- Identify rainy season movements of waders on the reserve's mudflats as well as their geographical origin and distribution over the subsites in the reserve.
- Identify types of wader movements that reflect mudflat use strategies (strategy based on overwintering at the same site every year, or on moving from one mudflat to another during the winter, or on continuing migration during the winter);
- Establish monitoring methodology based on a combination of three complementary techniques: ringing, marking and fitting with transmitters;
- Train Saloum Delta National Park staff and conservation officers of Senegal's Parks Department in wader monitoring and ringing techniques.

The thousands of waders ringed and the tens of thousands of birds sighted on Saloum Delta Biosphere Reserve's mudflats confirm the reserve's position as a key site on the waterbird flyway.

Some research findings are used in site and resource management and conservation. The following are mentioned by way of illustration:

- the artificial estuary in the Mauritanian lower delta was created following recommendations by the populations, on the basis of local knowledge of the ecosystem;
- a closed season is now observed for mullet fishing in the Banc d'Arguin and for mollusc gathering in Saloum Delta Biosphere Reserve; in both cases the decision was based on recommendations stemming from research on the biology of these species;
- fisheries practices in Djoudj park now comply with recommendations made about net mesh size and net type.

Because of the importance attached to training in the strategy for the implementation of wetland management programmes and plans, both national and regional scale training initiatives were organized.

National training is led by IUCN project managers in Mauritania and Senegal and is geared towards nationals involved in implementing management plans.

Training is target-specific, and the methods and strategies used vary accordingly (see Figure 4).

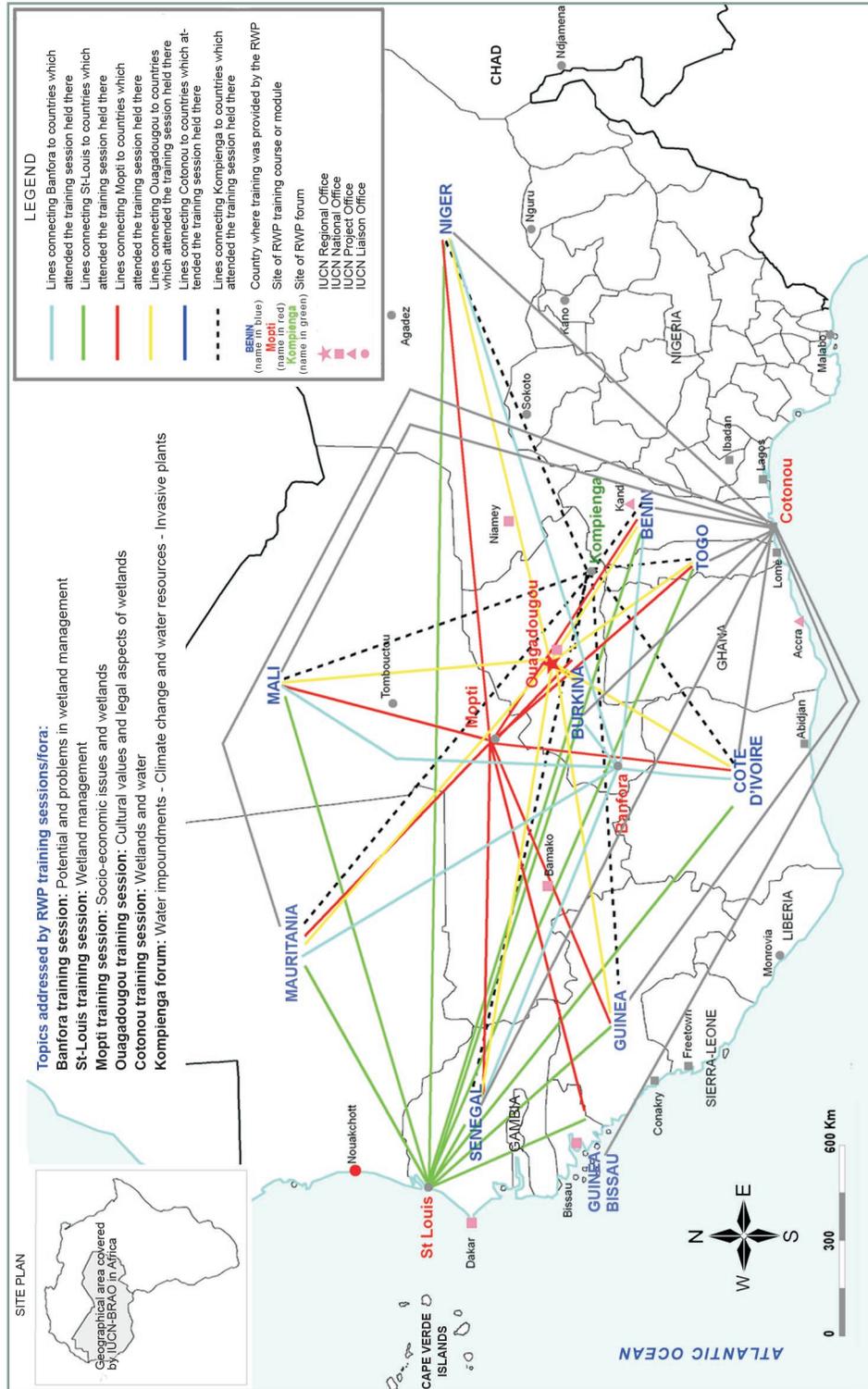
## Information and awareness

The purpose of information and awareness work is to familiarize target groups with the wetlands covered by the programme, the resources they contain, the ecological and socio-economic dangers of wetland degradation, and the ecological and socio-economic benefits deriving from wise use. It is important to clearly explain the issues and challenges of sustainable management and to trigger social movements to further the cause of sustainable resource development.

Target groups for information and awareness were:

- Conservation volunteers who are the interface between technical conservation personnel and populations living near project sites;

Figure 4. Training sessions and forums organized by the Regional Wetlands Programme.



**Table 4. Number of attendees by country at training sessions and fora**

	Training sessions					Fora
	Banfora (Burkina Faso)	St-Louis (Senegal)	Mopti (Mali)	Ouagadougou (Burkina Faso)	Cotonou (Benin)	Kompienga (Burkina Faso)
Benin	2	1	2	2	10	2
Burkina Faso	10	1	2	3	2	1
Côte d'Ivoire	3	1	1	1	2	2
Guinea Bissau	–	2	2	–	2	–
Guinea	–	2	–	3	2	2
Mali	2	2	Several	2	2	2
Mauritania	1	2	2	2	2	3
Niger	2	1	2	2	2	1
Senegal	4	10	2	2	2	3
Togo	–	1	2	2	2	3
Institutions: Wetlands International Project Waza Logone		2	–	–	Jointly with EPAC	–

- Communities living around the sites, the aim being to get them to gradually adopt behaviours which are more favourable for the environment and natural resources;
- Political decision makers, who should be encouraged to give greater consideration to wetland management issues in economic and social development policies and programmes;
- Donors, in order to secure their support and cooperation;
- Visitors to the sites (tourists, schoolchildren, students, etc.), so they can understand the issues involved in the wise use of wetlands; and
- Public opinion at national, regional and international level, providing information about the sites and explaining their strategic importance for economic and social development in their countries and regions.

The topics addressed were related to the issues of ecosystem conservation (biodiversity, sustainability) and the development of economic activities around protected areas (benefits and risks).

**The authorities of Banc d'Arguin National Park** organized meetings in Imraguen villages on the mullet fishery and the risks associated with the increased use of motor boats for fishing

inside the park. The range of media and tools used became very diverse (tea-time debates, educational materials, open house days, site visits, radio and television programmes; articles in the written press, exhibitions, posters, brochures...). The campaign raised awareness among the Imraguen about the need for better internal organization and joining in action to preserve resources in the park, especially mullet stocks.

**In Diawling National Park**, the awareness and consultation mechanism is institutionalized and operates regularly. It includes:

- One-day think tanks with 21 representatives from the villages around the Park on themes related to sustainable resource management;
- Discussion/debate sessions in the villages (approx. six per month) about good practices in resource use;
- An annual workshop for community representatives and local authorities, during which the yearly results of the management plan are presented and discussed and activities for the following year are selected.

Within the PALM project, meetings between stakeholders are the channel used for awareness raising (technical committee, round table on coastal development, meetings of the *cellule littorale*, etc.).

**In Saloum Delta Biosphere Reserve**, the information and communication plan includes training as a regular feature (approximately 30% of the budget is allocated to awareness and training). As a result, a local skills base has been developed in two fields:

- knowledge and know-how on ecosystem conservation;
- knowledge and know-how on local socio-economic development.

The two main target groups are the 49 peripheral villages and reserve staff.

### **“Enabling” training**

This is training to provide various groups with the technical and/or scientific skills needed to manage wetland resources sustainably. It is intended for:

- **the population:** training to build or improve capacity in habitat and resource conservation (reafforestation techniques, observation of time/area closures, protecting fish fry, techniques for harvesting oysters, selective ban on certain extractive practices in mangrove channels (*bolons*), etc.), financial management (accounting), local socio-economic development (dyeing techniques, sewing...);
- **park staff:** technical capacity building for management staff and park officers in bird counts and ringing, techniques for leading meetings, etc.;
- **partners:** increasing researchers’ wetland knowledge (the expertise accumulated by GREZOH – the Wetlands Research Group, was to a great extent gathered in Diawling Park with the help of park staff).

**At a regional scale**, training activities are directed by the IUCN Regional Office for West Africa (BRAO) in Ouagadougou. They are geared toward all regional entities involved in sustainable management or interested in wetlands issues in West Africa. Several types of

training are used – conferences, fora and workshops, as well as support to diploma courses. Three conferences and one forum were held during phases III and IV of the regional programme:

- A regional conference on Sahelian floodplains was co-organized with the African Development Bank in 1999, with the aim of defining guidelines and basic principles of floodplain management, and the development options which should be promoted on these sites;
- A conference on wetlands and sustainable floodplain management in the Sahel, jointly organized with OMVS in Bamako (2001), with the following topics on the programme: i) defining new directions and lines of action for the work of SAWEG members, ii) the official launch of “Towards the sustainable management of Sahelian floodplains” and iii) a discussion of the findings of the World Commission on Dams (WCD) study and the initiation of a regional dialogue on water, the environment and agriculture;
- A regional forum on small water impoundments, invasive aquatic plants, climate change and West African water resources (Kompienga, 2002);
- A regional conference on wetland conservation and development options (Niamey, 2003) in conjunction with the High Commission for the Development of the Niger Valley.

These conferences, attended by a total of 150 people, were organized jointly by key partners from the development policy implementation sector in West African states. The results of this type of activity are slow to materialize. Patience and repetition are therefore required, but the following changes are already discernible:

- Greater awareness about environmental issues;
- Greater involvement of river basin authorities in wetland management;
- Closer cooperation with IUCN (OMVS, ABN) in an alliance for conservation and sustainable development: by way of example, one impact of the visit to Manantali was that electricity was brought to the villages near the dam. Since the construction of the dam, the villagers had derived no benefit whatsoever from the electrical cables running overhead;
- Better collaboration with institutions like the African Development Bank.

Five regional training workshops were held to enable technical conservation staff to master tools and methods for sustainable wetland management:

- A workshop on the theme “Potential and problems in wetland use”, held in Banfora (1999);
- A workshop on “Wetland management”, held in St Louis, Senegal (1999);
- A workshop on “The socioeconomic aspects of wetlands”, held in Sévaré/Mopti (2001);
- A workshop on “Cultural values and legal aspects of wetland management”, held in Kamboïncé (2002);
- A workshop on “Wetlands and water”, held in Cotonou (2003).

In total, over 125 people attended these workshops, based on a quota of 25 participants per session. Changing attitudes, perceptions and behaviour requires much time and patience, which makes it difficult to gauge the impact of our training sessions. However, alumni of these sessions can often be seen here and there giving presentations or informal talks on wetlands in their respective countries, and they are increasingly committed to wetland management.

Some of these meetings were co-organized by IUCN and its partners (OMVS, BAD, the EIER/ETSHER group, etc.). There are two advantages to this system. Firstly, it strengthens partnerships and secondly, it is a way of reaching a target group which is directly involved in wetland management.

## **Diploma courses**

The Regional Programme has supported and continues to support three courses leading to diplomas: one vocational course (Ecole de Faune de Garoua) and two university courses:

- **A course in Water Management** offered by the Science and Technology Faculty of the University of Nouakchott;
- **A “Diplôme d’études supérieures (DESS)” course** in wetland conservation and sustainable use at the University of Ouagadougou.

The aim of this type of training is to supply West African countries with qualified human resources in the fields of water and aquatic ecosystems management, in a sustainable development perspective (the aim of the Water Management course), the formulation of general policies for the wise use of natural resources, and monitoring ecosystems and activities (DESS course).

**Networking:** The idea of networks emerged when we decided to bring together the people working in areas of mutual interest. Networks have long been used by research scientists, and modern information technology now makes rapid exchanges possible. Formalizing this way of working together represents an added value compared to any informal exchange process. Networking enables one group to build upon the experience of another and can act as a continuous monitoring mechanism. The network is a meeting point between those with technical, scientific and political skills and expertise and representatives of civil society. A network stimulates the circulation of information and the sharing of knowledge, and strengthens solidarity between those striving toward common goals. It relies on the voluntary commitment of men and women working for the same cause.

The programme supported the establishment of two types of networks, national and regional.

## **National networks of experts**

Five such networks were initially established, but all did not receive the same level of DGIS funding. The wetlands networks in Burkina Faso, Mali and Niger, all set up in 1993, had difficulty operating properly with the smaller allocations resulting from the decentralization policy of the Netherlands. Support was mainly focused on wetland networks in Mauritania and Senegal. Despite this handicap, the Burkina Faso network successfully published its book on the wetlands of Burkina Faso (IUCN, 1993).

**The Expert Group on Wetland Management in Mauritania (GREZOH):** This is a group of resource persons from different areas related to management, conservation and sustainable use of Mauritanian wetland resources. It is based at the Faculty of Sciences and Technology.

The network has several aims:

- increase and disseminate information about Mauritania's wetlands;
- raise the awareness of wetland users and decision makers;
- provide government officials with a tool for research, decision making and action;
- build capacity within Mauritania to manage wetlands from a sustainable development perspective.

The expert group has a laboratory for analysing water and soil samples which is also used to host and train students and interns.

**The Network of Mauritanian Wetlands Experts (REMAZOH):** Officially established in February, 2002, REMAZOH comprises members from a number of institutions (universities, IUCN, DEAR, PNBA, PND, civil society). The focal point is based in IUCN's premises. The network can claim credit for:

- a scientific programme which aims to contribute to sustainable development in areas around the Aleg and Mal wetlands, in Brakna *wilaya*;
- organizing and managing major events pertaining to the environment and sustainable development;
- taking part in a national workshop on wetland management;
- conducting research on Mauritanian continental wetlands.

**The Senegalese National Wetlands Network (RENZOH):** The National Wetlands Network was established in 1995. It endeavours to promote a better understanding of wetland ecosystems and, ultimately, the development of a national strategy for wetland planning and management which will encompass all wetlands, protected or not, as recommended by the Ramsar convention. RENZOH has shown itself to be influential, as evidenced by the following results:

- The adoption of a law on the use of the Niayes area and its many wetlands;
- The embryonic development of a national wetlands policy, based on the inventory of the country's five ecogeographical regions as determined by the network;
- The creation of a network of members of parliament interested in the environment, and an association of communications officers specialized in wetlands and trained by RENZOH.

## Regional networks

The IUCN Regional Wetlands Programme in West Africa is mainly responsible for two networks: the regional network for Sahelian floodplain management or Sahelian Wetlands Expert Group (SAWEG) and the Coastal Planning Network.

**Sahelian Wetlands Expert Group (SAWEG):** SAWEG is a group established in 1993 which has over 150 specialist members (engineers, ecologists, hydrologists, health experts, decision makers, etc.) from universities, ministry departments and river basin authorities. The main thrust of its work has been the collective production of documents:

- the *Wetland Management Training Manual*; and
- *Toward sustainable management of Sahelian floodplains*.

SAWEG's aims are:

- to draw up a synthesis of available information on Sahelian wetlands in order to further our understanding of floodplain functioning, gain a better grasp on threats to ecosystems and suggest wise use measures;
- to build capacity among floodplain managers, decision makers and planning officials;
- to influence policy on the hydroagricultural development of floodplains.

**The Coastal Planning Network (RPC):** This network was launched in November, 1997 in Bubaque (Guinea Bissau) and now (2005) has over 150 members. Its stated goal is to influence societies to adopt the idea of sustainable and harmonious development of the coastal zone. Among its objectives for attaining this goal are:

- to act as a multidisciplinary and multi-actor framework for cooperation and information exchange;
- to influence national policies on development and integrated management of coastal areas;
- to enhance skills in the field of coastal development and integrated coastal management at sub-regional level;
- to highlight and publicise success stories;
- to educate and inform relevant populations.

IUCN's involvement spans three areas:

- framing national coastal zone management programmes and establishing linkages between countries;
- providing integrated measures in response to priority issues affecting marine and coastal ecosystems;
- providing integrated measures in the field of industrial and commercial fisheries.

The enthusiastic and active work of this network and its partners led to the development and establishment of the Regional Programme for Coastal and Marine Conservation (PRCM) which is now being run by a consortium of NGOs: FIBA, IUCN, Wetlands International and WWF.

## **Exchange and study visits**

Study trips are an activity which could be classified as training. It is true that they instruct and train, but they also create ties of solidarity and friendship which put them in a separate category

altogether. Furthermore, they rely on learning methods which are different from those of conventional training. Study visits provide opportunities for real-life and hands-on experiences, and stimulate cooperation between institutions in charge of site management. The innovative element in this case was that populations and their elected officials took part in exchanges which took them out to the sites and field projects. The examples listed below are a good illustration of the aim behind these trips for experts and local producers.

- A visit to the wetlands project in Youvarou (inner Niger delta) was organized in March, 2001 for a delegation comprising five representatives of communities from Diawling National Park (Mauritania) and five from Djoudj National Park (Senegal).
- In September, 2002, a group of representatives from Djoudj National Park (Senegal), Diawling National Park (Mauritania) and the inner Niger delta (Mali) visited the Waza Logone project in northern Cameroon.
- A group from Mole National Park in Ghana and “W” Park (Benin, Burkina Faso and Niger) visited Djoudj and Diawling parks in November, 2003.

Other study trips were organized in Banc d’Arguin National Park to enable representatives to exchange information and experience gained through the fishing boat project, and in the Saloum to present the market gardening project.

**Inter-group and inter-community trips and visits** were also planned by national projects for populations of different sites located in the same country which had different or innovative experiences to tell about. These opportunities create strong enthusiasm and stimulate contacts between villages (the visit by a group from Djoudj National Park to Popenguine Reserve to learn about mutual credit banks turned out to be informative and useful for both communities).

## 2.5 Institutional support

A fuller understanding of conservation and biodiversity issues has grown up within the populations. New relationships have been established. The old image of protected areas as places which simply restrict their rights and sphere of action is dying out, and the people now also see them as potential assets which hold the promise of real benefits. This changing perception has been observed and expressed by the village populations living around Djoudj National Park, those living inside Diawling National Park and in the Banc d’Arguin, and has led to a change in behaviours. The people now engage in many conservation support activities, such as:

- Anti-poaching surveillance: in the Saloum delta, it was local “beach committees” that arrested dolphin poachers and handed them over to the Senegalese authorities. In Djoudj park, the eco-wardens round up free-roaming cattle and load them into lorries;
- Invasive aquatic plant control: Control measures have been taken on by some populations, i.e. mechanical harvest of *Salvinia molesta* and *Typhae australis* in Djoudj National Park;
- Reafforestation and exclosures: Operations were carried out in Diawling National Park and in Saloum Delta Biosphere Reserve.

The beginnings of awareness lead to commitment, mobilization and organization within the populations, and more specifically within groups or organizations that facilitate local co-operation and action. In short, these groups often grow into local or regional institutions and institutional mechanisms. Thus, the institutions emerging on the edges of protected areas (National Parks, Biosphere Reserves, Biological Reserves) – management committees, steering committees, guidance committees or cooperatives, etc. – are instrumental in raising local communities' awareness. Knowing that the opinions of their representatives are taken seriously fosters trust. As their understanding grows, they take up their rightful place in the mechanisms created. Their real and lasting contribution to defining management rules and their commitment to enforcing them become more tangible and sustainable. In Banc d'Arguin National Park, the Imraguen are party to the establishment of fishing regulations applicable in the park's waters. In Saloum Delta, "beach committees" set codes of conduct and enforce them scrupulously. In Diawling National Park, local communities took part in drawing up the hydrological model and shaping the artificial estuary.

A population that understands wetland values is more likely to be concerned about their preservation. This principle was borne out in Saloum Delta when local communities worked to inventory their area's wetlands and then submitted them for designation as community-based protected areas.

The existence of the protected area brought communities together and reduced ethnic divisions in the peripheral area. Around Djoudj National Park, for example, pastoralists and farmers are working together, and in conjunction with park authorities, on the problem of free-roaming cattle. With support from GTZ, and as part of the Three-year Integrated Management Plan, they are seeking to establish programmes to develop better grazing lands. The first experimental project on fodder crops, supervised by ISRA, is underway in Débi-Tiguette.

Management plans provide a framework for closer relationships between stakeholder groups and for learning together through action. For the managers, these plans made the wetland resources conservation strategy more readily understandable. The biological potential of parks and reserves, and the consequences of losing this potential are increasingly clear to the authorities in charge of these ecosystems; consequently, they are more willing to listen to and seek the involvement of populations in management.

Local communities are increasingly assimilating the advantages afforded by parks, and are joining in efforts to guarantee their future. It can therefore be said that the inclusive approach and dialogue reconcile conflicting interests, make it easier to find mutually-agreed solutions and transform mere decisions into social contracts. The result is new mechanisms being carried forward by the new institutions which have emerged around all the parks and reserves involved in the programme, and new synergy between conservation, research and development.

## 3. Critical review of the Regional Wetlands Programme

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The regional programme is divided into two strategic areas of work, i) site projects and ii) capacity building for national and regional partners. It was developed and implemented using an approach built up gradually by IUCN and its partners, and tools which were designed and refined along the way. The following analysis first addresses the process itself, reviewing how it was engaged and conducted, then looks at the results it produced, assessing their scope and limits.

### 3.1 The process

The methodological sequence used to set up negotiated programmes with states to assist them in managing their wetlands sustainably can be called the “IUCN approach”, since it has been used systematically at all sites where IUCN has been active. The approach can be broken down into five stages, ending with the drafting and implementation of an integrated management plan for ecosystems and fragile resources, or a plan of action.

In this section, the various stages of the programme are described: i) raising awareness, ii) project development, iii) securing funding, iv) implementation and v) lessons learned.

#### Raising awareness

The first stage involves developing institutional and social communication to gain acceptance for the programme.

In Senegal, the launching of IUCN’s work in Djoudj National Park was preceded by information sessions to explain the importance of wetlands and issues regarding the populations’ participation in protected area management. These sessions were important for two reasons: firstly, the proposed approach challenged the traditional system of natural resources management which was relatively regimented and totally state-directed (by the Water and Forests Departments and the National Parks Department), and secondly because the population’s relationship with the government administrations had been fraught with conflict for over two decades; it took some time to gradually reassure the people about (and through) the new approach.

The concept of establishing Diawling National Park in Mauritania also required advocacy work to overcome resistance from several quarters, including the public authorities.

The mullet project process started off with inter-institutional consultations (Ministry of Fisheries and the Maritime Economy, IUCN, FIBA, PNBA) to develop the approach. Sectoral meetings were held first to allow each sector to voice its concerns. This set of consultations was rounded off by a general meeting for all groups involved in the mullet fishery.

Awareness raising often required an initial participatory assessment at the individual sites to get a more complete picture of the ecosystem, obstacles to conservation and the dangers of

certain types of resource use. This preliminary exercise is also a good indirect way of mobilizing and informing national experts, identifying potential partners and then, working one to one, fostering communication and exchanges about the resource and floating the idea of starting a network (i.e. GREZOH – the Wetlands Research Group).

## **Developing the project document**

Once the basic project concept has been accepted (by the public authorities, the population, the research community and other potential partners), the next step is to develop a project document. This entails selecting actions, ranking them by order of priority and setting a timeline for implementation. The phase of defining this logical framework for the project is a time of discussion and negotiation between conservation (ecological) interests and social development interests.

This phase includes a sub-phase in which in-depth studies are performed, often by the national network of wetland experts. In the case of Saloum Delta Biosphere Reserve, 17 studies in various fields were carried out by a multidisciplinary team in preparation for the drafting of the management plan. The studies helped to pinpoint problems and shed light on the ecological, economic, social and cultural dimensions to be factored into the management plan.

The finished project document is validated through participatory procedures which include all of the interest groups: national and local authorities, technical personnel, researchers, the population at large.

## **Securing funding**

The validated project document is submitted to a broad group of donors in order to guarantee the largest possible number of financial partners.

Through this procedure, four partners joined the Djoudj management plan project during the first phase:

- North Rhine-Westphalia, for building, equipping and operating the biological station;
- the Netherlands, for resource conservation and ecodevelopment activities;
- the Nord-Pas-de-Calais region in France, for the ecomuseum and the village shop;
- Germany, for socio-economic activities in the peripheral area of the park.

## **Implementation and evaluation of activities**

Strategic activities accompanying the actual implementation included the following:

- The creation of new institutional mechanisms for administering and monitoring/ evaluating the plan, in keeping with the approach;
- The organization of a number of interconnected committees whose remits and membership are defined through consultation (steering committee, inter-village committee, management committee, scientific committee, etc.).

- The opening of a small administrative unit to manage the programme at regional level, i.e. to deal with all shared regional activities.
- The opening of a small administrative unit by IUCN for managing national projects;
- Using public and open application procedures to recruit programme staff;
- Putting the programme and projects through internal and external mid-term evaluation procedures and an end-of-project external evaluation.

### **Reviewing lessons learned**

This stems from a recommendation made by the Phase III evaluation mission to extract the most valuable experiences from the programme.

It must be stated, however, that the process displays several flaws.

### **IUCN's withdrawal strategy**

IUCN's withdrawal strategy, which should have been a visible component of the approach, was not clearly laid out at the development stage of the project. The withdrawal strategy is usually put in place halfway through the final stages of implementation of the plan. Once established it is seldom disclosed to the populations, who are left hoping that the project will always find the means to continue operating. This makes them ill-prepared to move into the phase in which they will be required to sustain the project and perpetuate the approach.

In Djoudj National Park, the withdrawal strategy was given no thought until the last year of the three-year management plan. The main issue was how to deal with development in the park's peripheral zone (keeping the banks and village credit unions open, managing the *pirogues* and the tourist camp, managing the drinking water system, ensuring that the inter-village committee would continue to meet, etc.). One can legitimately wonder to what extent IUCN will be able to provide follow-up and support to them now that the three-year management plan has reached its end.

### **IUCN's position and misunderstandings thereof**

IUCN's partners do not always have a clear understanding of the Union's position in the programme. The population often mistakes IUCN for the funding agency.

For conservation staff, particularly in Senegal, IUCN is not only the commissioning agency (making decisions, providing funding, performing monitoring and evaluation functions) but also the executing agency (responsible for design, study, supervision, field work and related activities). Their confusion about IUCN's role is detrimental to their ability to fulfil their mission.

These shortcomings, which can be attributed to the process, did not prevent the programme from producing results.

Figure 5. Inventory of wetlands in West Africa.

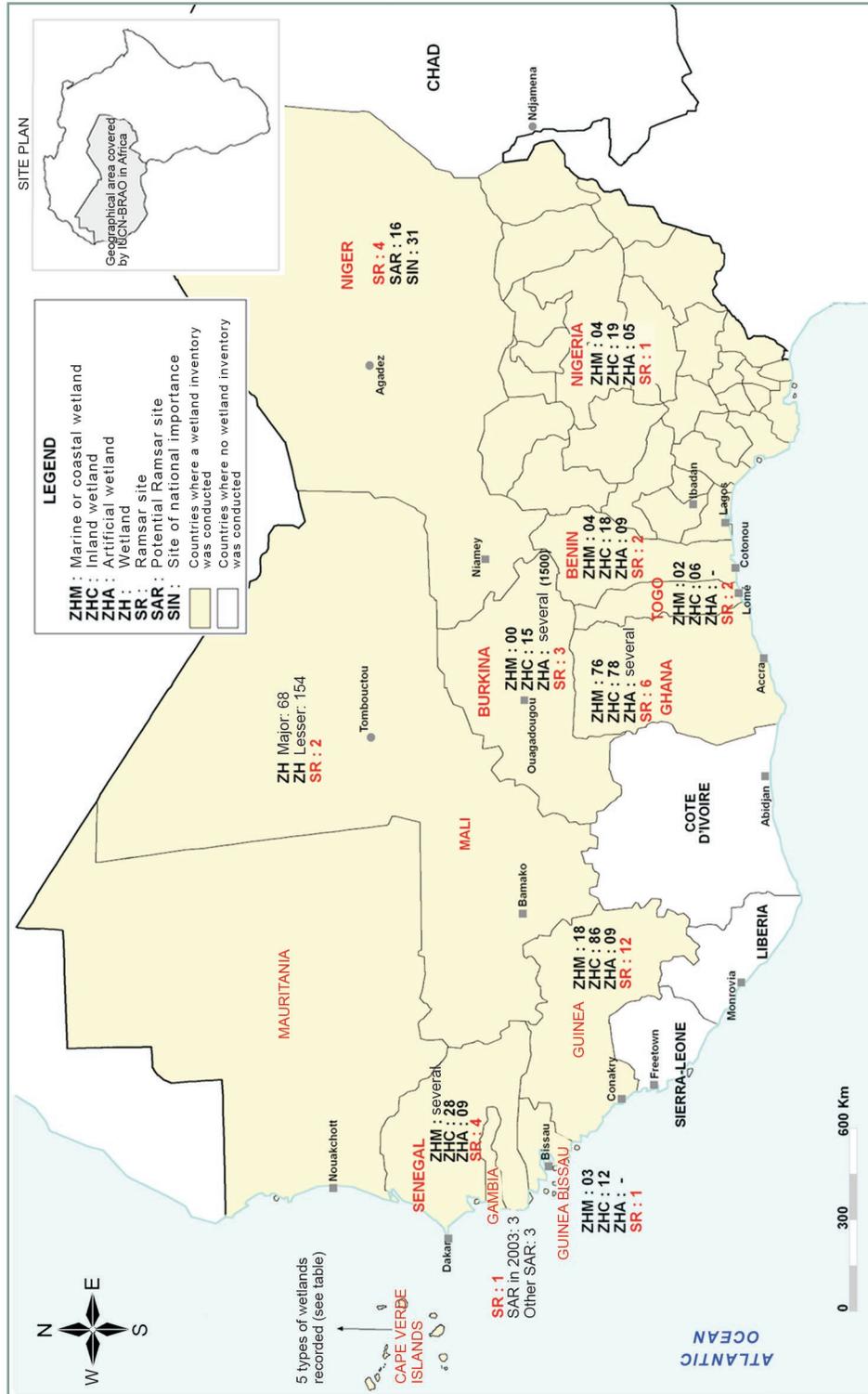


Table 5. Wetland inventories in West Africa by country.

	Marine wetlands (ZHM)	Inland wetlands (ZHC)	Artificial wetlands (ZHA)	Other types of wetlands	Number of Ramsar sites (SR)
Guinea	18	86	9	–	12
Benin	4	18	9	–	2
Senegal	Several	28	9	–	4
Togo	2	6	–	–	2
Ghana	76	78	Several impoundments	–	6
Guinea Bissau	3	12	–	–	1
Burkina Faso	–	15 (8 with detailed data sheets)	Several (approximately 1500)	–	3
Nigeria	4	19	5	–	1
Niger	–	–	–	Potential Ramsar sites: 16 Sites of national importance: 31	4
Mali	–	–	–	Major wetlands: 68 Lesser wetlands: 154	2
Gambia	–	–	–	Potential Ramsar sites in 2003: 3 Potential Ramsar sites: 3	1
Cape Verde	–	–	–	5 types of wetlands recorded: sandy coastal beaches; coral reefs; saltpans and salt marshes; Petra Lume saltpans; “Terras Salgadas” (salt marshes)	–
Mauritania	Data for Mauritania not yet available at BRAO				

## 3.2 Outcomes

The programme's objectives were successfully attained in some areas, but weaknesses were observed in others.

### Successes

**The establishment and management of protected areas:** The protected areas created under the programme are a major success for all partners. More specifically,

- The establishment of Diawling National Park has been a successful undertaking;
- Community-based marine protected areas were set up in the Saloum delta: Fambine, Assanga-Isofna, Pata Ngoussé, Bamboung and Laga.

Management of these protected areas draws on local knowledge and on the idea of promoting socio-economic development for resident populations. The decision to create them was won through major efforts to persuade and motivate many partners (public authorities, local elected officials, donors, populations, researchers, technicians...) of the importance of conservation activities.

**Restoration of degraded ecosystems:** One aim of the programme was to restore degraded ecosystems. Normal functioning of the hydrological systems of the Diawling and the Néma valley (Saloum delta) was re-established, enabling fish populations to recover and recreating habitats and processes enabling bird populations to come back and thrive (the return of waders to Saloum Delta Biosphere Reserve is particularly noteworthy).

Plant communities in the Diawling also regained a certain vitality (*Sporobolus*, *Acacia nilotica*, etc.).

Biological control measures against *Salvinia molesta* produced dramatic results: the spread of the invasive species, which posed an extremely serious threat to the Diawling and Djoudj ecosystems, was checked in a fairly short period of time.

**Development and adoption of new tools for planning and action:** New tools and approaches for better ecosystem and resource management were developed. The management plan, with its integrated approach and the inclusive procedure used to develop it, was a striking innovation. Building on the participatory approach, it introduces a new model based on institutional mechanisms (management committees, steering committees, scientific committees, "beach" committees...) that guarantee the sharing of resource management information and responsibilities among stakeholder groups. And indeed, the trust created during the implementation of the management plan, and the new benefits that it offers to the people (through ecodevelopment) have created an entirely new situation featuring:

- The reconciliation of populations and protected areas managers (i.e. in Djoudj National Park);
- The emergence of volunteer work for conservation (ecowardens in Djoudj park, Saloum Delta Biosphere Reserve);
- The adoption of codes of conduct (limiting fishing to traditional sailboats in Banc d'Arguin, the calendar for harvesting vegetation in Diawling National Park and Saloum Delta Biosphere Reserve, observation of time/area closures).

**Incorporating research into the programme:** Conservation and development programmes are not always designed and conducted in partnership with the research community. The Wetlands Programme decided that research should play a role in the integrated management and sustainable use of resources. This was a basic premise of the management plans, and explains why the institutional management mechanisms of all the plans included a scientific committee. These committees were responsible for validating research carried out under the programme, or by external scientists pursuing the same goal: to provide relevant information to guide decision making about resource development and management.

Some outcomes of the research were:

- The establishment of exhaustive status reports for a number of animal and plant species in protected areas and reserves;
- Increased knowledge of habitats and ecology and accurate site mapping;
- The incorporation of local knowledge in planning and implementation processes;
- The provision of equipment and information-gathering and processing instruments at all relevant sites (limnometric scales, Thalimedes automatic recorders, weather stations, GIS, etc.). Some sites, such as Djoudj National Park and Saloum, now have the beginnings of fully-fledged biological stations;
- Scientific partnerships have sprung up at national level (universities in Mauritania and in Senegal) and at international level (universities and research centres in other countries) regarding the use of this equipment and the kinds of data that can be gathered with it;
- At a regional level, inventories and descriptive studies on wetlands are available thanks to research in 12 countries: Benin, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea Bissau, Mali, Niger, Nigeria, Senegal and Togo. Special mention must be made of Mauritania, which initiated and funded its own wetlands inventory. Added to the work done by national networks (GREZOH and REMAZOH in Mauritania, RENZOH in Senegal), these studies greatly improved the level of knowledge available on wetland ecosystems in the subregion (see Figure 5).

**Training:** During Phase IV, site-based management programmes placed great emphasis on training stakeholders so as to consolidate conservation-promoting behaviour and maintain ecosystems in the condition achieved by the major restoration work carried out.

**The programme of in-service training** made it possible not only to teach staff their core task – conservation – but also to impart all the related know-how needed to manage sites in a cooperative perspective (participatory approaches, communication techniques, techniques for developing and guiding village micro-projects, etc.).

**The local communities** also took part in training modules which strengthened their capacity in various fields, such as:

- conservation – building enclosures, reforestation, definition and observance of time and area closures for certain resources, participatory development and enforcement of codes of conduct;
- development – savings, investment, market gardening, beekeeping, auxiliary activities in ecotourism, etc.

**Researchers** also received training in new practices used at the sites. In fact, the sites acted as veritable training laboratories for wetland experts.

**IUCN's members and partners in West Africa** were invited to training, information and communication sessions to encourage them to adopt methods and tools for sustainable wetland development. These training opportunities developed technical and scientific skills as well as skills in group leadership and communication for those who were information focal points within communities, park staff, the media and administration officials.

Training administered by the Regional Office went a long way toward providing West Africa with real expertise in the field of wetlands. The offering was built on a multidisciplinary approach:

- Motivation, organization and training under the auspices of national networks (GREZOH and REMAZOH in Mauritania, RENZOH in Senegal) and regional networks (SAWEG, Coastal Planning Network – RPC);
- Training sessions for a wide range of target groups; technicians, researchers, decision makers, communication staff, populations, etc;
- Study trips as opportunities to share experiences;
- Academic (University of Nouakchott and University of Ouagadougou) and technical training (Garoua);
- Support to research (wetland inventories and descriptive studies) and developing training and management tools (handbooks);
- Support to encourage attendance of conferences and other events.

Most of the abovementioned activities reached beyond the five countries officially included in the programme. These were countries where similar projects, some funded by DGIS, were being carried out: Cameroon, Côte d'Ivoire, Ghana, Guinea, Guinea Bissau, Nigeria and Chad. Extending the influence of the programme was a good strategy for sharing expertise with the rest of the subregion.

**Greater credibility on wetland issues:** With their knowledge on wetland ecosystems, experts in the subregion command increasing attention from the public authorities, donors and other groups of wetland resource users. Their influence on political decisions regarding wetland management is therefore greater. In Mauritania, they played a part in drafting the Coastal Act. In Senegal, they acted as catalysts in the drafting and enactment of a law on the use of the Niayes area, as well as in the establishment of a network of parliamentarians for the environment, and the founding of associations of wetland communication specialists.

The support and advice role that wetland management experts are now gradually taking on *vis à vis* decision makers is the result of a process of trust-building supported by the programme and comprising the following stages:

- The experts provide a synthesis of scientific information about wetlands to decision makers responsible for wetland management;

- The experts inform decision makers about international conventions on wetlands (the Ramsar Convention), the obligations for states which ratify it and the advantages of using the implementation mechanism to strengthen national policies on wetlands;
- The experts inform and guide decision makers toward a better understanding and more accurate knowledge of the dangers of wetland ecosystem degradation and challenges of sustainable management;
- The experts design and set up warning systems which provide a concrete demonstration of risks and consequences. They furthermore urge decision makers to take the necessary institutional and/or organizational measures to prevent or halt resource and ecosystem degradation. The mullet fishery is a good example.

**Outcomes of national workshops and international conferences:** These events were organized by the programme alone or jointly with other organizations (OMVS, the African Development Bank, development cooperation agencies, etc.). They were key opportunities for dialogue and exchange between experts and decision makers (example: workshops on managing mullet populations, on Sahelian floodplains, and on the Niayes ecosystem, etc.).

The skills acquired by the wetlands experts are a major asset for them in their future careers. State administrations and NGOs alike increasingly seek them out for positions involving decision making. The supply of qualified experts in the subregion is gradually expanding to meet the demand in the field of wetland management.

This expertise is organized in networks. Networks set up under the programme at national level (GREZOH, REMAZOH, RENZOH) and regional level (SAWEG, RPC), have made a large and varied contribution to wetland management (inventories and site/resource surveys, cultural aspects, methodological tools, management handbooks, etc.).

## Weaknesses identified

Although the regional activities directed by the Regional Office in Ouagadougou extended training and exchange activities to a fairly large group of countries, site work was restricted to Mauritania and Senegal, where many other areas are still in need of restoration. Despite the exchanges developed within the programme, the main problem is that the example is not being followed seriously. In each country, it will take further experiences to prove that these approaches are truly feasible. Consequently, on a sub-regional scale, the amount of restoration and conservation work still to be done is tremendous. Even in the two countries where most of the activity was focused, the programme at times encountered hurdles which slowed down some of the work.

**In Mauritania,** work on the coastal development plan (PALM) was delayed by:

- **Administrative and financial problems:** The IUCN-DGIS agreement was signed after the scheduled date, and additional funding from UNDP was not granted;
- **Technical problems in the field:** There was a lack of resources for monitoring dune movements and coastal erosion triggered by the extension of human settlements and the unregulated removal of sand from the beach;
- **Problems in relation to the host institution:** The development plan (PALM) was initially administered by the Directorate for Regional Planning and Action (DATAR) on

behalf of the Ministry of the Interior. After this institutional arrangement was challenged by the Ministry of Fisheries and the Maritime Economy, PALM was placed under the supervision of the Ministry of Fisheries which gave the responsibility for administering it to the Merchant Navy. The transfer from one supervisory authority to the other gave rise to transitional problems which affected the smooth operation of the plan;

- **Positioning problems among supporting partners:** When the development process for PALM was already underway, the Mauritanian government won a grant from the French development cooperation agency to establish a national development plan (PDAL). This meant that there were two simultaneous planning processes for the coastal zone, supported by two different donor agencies, with different objectives. This also had a repercussion on PALM: the first version of the plan was not approved.

**In Senegal**, joint institutional management of the plan for Djoudj National Park was an impediment to implementation of the activities, which were delayed and thus out of phase.

**Organizational and financial factors** (as well as technical) beset the implementation phase of the plan. Two factors especially restricted the process: first, the difficulty in calling in the financial commitments made by all the partners and secondly, the lack of synchronization between the start of IUCN activities and those of GTZ.

Four partners initially pledged funding for the Djoudj plan:

- North Rhine-Westphalia, for the construction, fitting out and operating of the biological station;
- The Netherlands, for resource conservation and ecodevelopment activities;
- The French Nord-Pas-de-Calais region, for the ecomuseum and the village shop;
- Germany, for socio-economic activities in the peripheral area of the park.

The commitment by Nord-Pas-de-Calais was limited to engineering work on the ecomuseum and to training management staff for the village shop.

This meant that funding for the management plan mainly depended on contributions from the Netherlands and Germany.

IUCN was supposed to coordinate the action of all the donors to the plan. However, Germany obtained permission from the Senegalese authorities to appoint an executing agency of its choice (GTZ) to manage how its funding contribution was spent. This caused:

- a delay in arrival of the German funding (due to lengthy procedures);
- lack of clarity in the institutional focus of the plan: a project (“Projet Périphérie”) was set up to direct the work funded by Germany and a GTZ staff member and a Senegalese counterpart were appointed to run it from an office on the Djoudj site. All of this contributed to the widespread perception that there were two different plans being carried out in the park although they were really just two components of the same management plan (PQGI for phase I and PTGI for phase 2);
- poor circulation of information among the different entities involved in implementing the plan.

**Insufficient coordination:** There was inadequate coordination between OMVS and the administrations of the Senegal delta parks (Djoudj and Diawling), especially as to how management choices at Diama dam affected the entire hydrological system of these two protected areas.

**Insufficient use of knowledge acquired:** Despite the accumulation of a large body of information on wetlands and the fact that it was transmitted to the public authorities, the level of activity devoted to developing national wetland policies has remained low. These countries do not have basic policy documents which indicate clearly the state of planning on wetlands and where they lie on the scale of priorities within the general framework of development policy. Instead of such fundamental and basic documents, the authorities still mainly use isolated or stopgap measures in response to urgent situations such as floods or the *Salvinia molesta* invasion in the lower Senegal delta. In addition, the key results of the networks' research and work are often only circulated within the immediate circle of programme participants. There is, however, hope that the promotional work already begun by experts trained by the programme and by experienced programme site managers will soon lead to more positive developments.

Research work has produced important results for all the sites, both in qualitative and in quantitative terms, but they have been disseminated only on a very limited scale. Where the research is conducted by the networks, it is usually published for internal use (for network members and IUCN).



## 4. Conclusions: A wide open future

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West Africa has a myriad of wetlands of all ecoclimatic nuances, from the oases and large temporary lakes north of the Sahara and the Sahel, to the sprawling deltas on the upper courses of major rivers, the handful of great lakes such as lake Chad, the coastal lagoons and mangroves. Many local economies depend heavily on these wetlands. The rapidly growing population relies on them for food production. The vision of a lasting existence for these complex, fragile and diverse systems, of the long-term contribution they could make to the preservation of ecological and cultural values, and the role they play in improving the livelihoods of human populations motivated IUCN to initiate the Regional Wetlands Programme for West Africa.

We can state, along with all involved parties, that “using a balanced approach combining biodiversity management, rural development, and social and cultural considerations, IUCN-BRAO has proved that it is possible to restore seriously degraded ecosystems. Priority is given to the economic valuation of natural resources and, by extension, to the role conservation can play in the fight against poverty. Work at many sites has shown, through economic valuation of wild natural resources of conservation importance, that there is a close correlation between conservation and economic development” (Intersessional Programme for West Africa 2005–2008).

The core group of Programme countries decided to focus on wetlands by necessity, but also by strategic choice with the following needs in mind: understanding the resources and the processes that affect them; understanding the socio-economic and human systems (cultural and traditional...) which develop resources for their own well-being and which contribute to sustainability; educating and training new or better-qualified personnel to manage the natural resources; creating new mechanisms for social organization in order to secure more energetic and determined involvement. National and local efforts made toward these ends were by no means isolated. They were associated with regional initiatives and world conservation networks, in other words they took place in a broad framework which offered opportunities for cooperation with and recognition by external counterparts.

More specifically, the Programme gathered much new information that updates the knowledge base regarding Djoudj, Diawling, Banc d’Arguin and Saloum delta protected areas as well as the Mauritanian coastal zone. This information tells us that these sites are among the most important in sub-Saharan Africa in terms of biodiversity. They are also areas which have become vulnerable due to the deterioration of the Sahelian climate over the last 30 years and to certain human activities. However, restoration work conducted under the programme’s auspices has shown that ecosystems have the ability to recover under good conditions and if local populations go back to better resource use practices and agree to apply and abide by the principles of wise use in wetland management.

The framework and institutional arrangements created by the programme give greater chances of success to the activities planned. The set-up is of course still fragile, but for those who operate it, it is a way of cooperating to harmonize action and better contribute to project implementation while taking into account the variable site conditions, the interests and level of

motivation of the population and the means and skills available. The cornerstone of the system, the integrated management plan developed and tested by the programme, has proved that conservation and development are not mutually exclusive, and that it is possible to involve and train experts in wetland management.

The expertise in wetland management now available in the sub-region is one of the keys to sustainability for these resource-rich areas that are vied for by many competing interests. The sub-region now possesses the skills to inform, raise awareness, train and even influence decision makers' opinions on the issue of sustainable resource use.

Whether or not the programme's achievements will be maintained now largely depends on the participatory institutional mechanisms generated by the process. The future of these mechanisms (committees, working groups...) will be decisive; if co-management and co-operation between stakeholders outlive the programme, the *acquis* will be preserved and strengthened. We can learn from the example set by the Banc d'Arguin (which still needs to be consolidated), through the cooperation framework created by the "Lanches" project and the initiatives taken to develop a new project on a sustainable fishery for the Imraguen (VPDI). It is crucial to build on the foundations of new knowledge and expertise laid by the programme and to move forward.

Weighing up its strengths and weaknesses, we can say that the programme strategy based on combined site projects and capacity building through training, extension work and communication has yielded positive and promising results. It has proved itself able to provide solutions to ecosystem degradation and instruments for sustainable resource use.

The firm rooting of the processes set up within national systems, ensuring that the relevant institutions take charge, and that mechanisms established at grassroots level and at political level are sustainable, are the final challenges. The programme and participating states have developed the tools they need to rise to these challenges. The number of people trained, the new institutions and mechanisms, the budding political awareness all give reason to hope that the conservation and sustainable use of wetlands in West Africa will gather strength over time. The outlook is positive for the development of a more lasting awareness of the importance of wetlands and for their systematic and substantive inclusion in economic and social development programmes as well as environmental protection programmes.

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# Appendices



# Selective bibliography illustrating the scientific and technical contribution of some aspects of the project

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