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MOROCCO BIODIVERSITY AND TROPICAL FORESTRY ASSESSMENT

PROSPERITY, LIVELIHOODS AND CONSERVING ECOSYSTEMS (PLACE) IQC TASK ORDER #3

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EXECUTIVE SUMMARY

This biodiversity and forestry assessment of Morocco has been conducted in conjunction with the preparation of the USG Country Assistance Strategy in compliance with Foreign Assistance Act (FAA) Sections 118 and 119. In particular, Section 119 (d) of the FAA requires that the assessment include an analysis of:

1) "The actions necessary to conserve biodiversity, and;
2) "The extent to which the actions proposed for support by the Agency meet the needs thus identified."

The identification of opportunities for the USG to have positive impacts on biodiversity and forestry conservation in Morocco is the final step of the following analytical process:

- Review of the biodiversity and forests of the country;
- Identification of threats to biodiversity and forestry conservation and their root causes;
- Identification of the constraints to effective conservation;
- Identification of the actions needed to overcome these constraints;
- Analysis of the conservation initiatives underway in respect to actions needed;
- Analysis of the extent to which the CAS and ongoing USG programs contribute to, or hinder, biodiversity and forestry conservation; and
- Identification of opportunities for the USG to have positive impacts on biodiversity and forestry conservation within the general framework of the CAS.

Overview. Morocco is located in the Mediterranean Basin Hotspot, one of earth's 25 "biologically richest and most endangered ecoregions." It houses the second greatest concentration of terrestrial biodiversity in the Mediterranean basin and the greatest concentration of marine biodiversity. Morocco has a species diversity of more than 31,000 species of which about 11 percent are endemic –the rate of endemism is about 20 percent among vascular flora. Morocco's national development strategy is based on its agricultural, forest and marine biodiversity resources. Morocco also has an exceptional number of wild relatives of domesticated crops. All ecosystems are under pressure and most are moderately-to-severely degraded. The total number of threatened species for Morocco is estimated to be at least 2,280 species. Threatened species are strongly dominated by terrestrial taxa. Plant species, in particular, constitute, more than 80% of the Moroccan threatened species.

There are ten national/natural parks including three that have marine areas within their boundaries. 160 Sites of Biological and Ecological Interest (SIBE) were identified on the basis of a country-wide ecosystems assessment and some of them are being converted into new protected areas. All protected areas and all forest areas have people living in them – people who grow crops, graze livestock, and harvest forest products. Marine areas are poorly represented in the protected area network.

Threats to biodiversity

Threats to terrestrial biodiversity. Nearly all state-owned forest and rangelands are severely overgrazed. In many areas, overgrazing eliminates nearly all forest regeneration leading to soil erosion, spoil compaction, and degradation of watersheds. Livestock use of state-owned forests and rangelands is primarily characterized by open access to the resources. The resource is used as a free good – no one pays for using it and no one among its users invests in its management.

Overgrazing is a major cause of watershed degradation. Firewood and many non-timber products are very seriously and illegally over-exploited. Other threats to forest areas include fragmentation, climate change, conversion to agricultural and urban uses, wildfires, and invasive alien species.

Threats to marine, coastal and freshwater biodiversity. Overfishing/overharvesting of marine and coastal biodiversity is the greatest and most generalized threat. Drainage, development, and urbanization are major threats to wetlands and coastal ecosystems. Fragmentation of habitats by dam construction is a major threat to river and wetland ecosystems. Pollution threatens many aquatic ecosystems and coastal marine ecosystems. Other threats include invasive exotic species, climate change, sedimentation, and poaching.

Constraints to effective biodiversity conservation

Constraints to conservation of terrestrial ecosystems The land tenure system provides very little incentive for local people to conserve the forest. The laws governing the commercial harvest and marketing of biodiversity products from state lands have almost systematically excluded local communities and resource users from these benefits. Commercial products from organized timber sales are almost always harvested by relatively wealthy elite. Those who live in or near the forest are systematically excluded from the direct financial benefits from forest products. Nearly all forest lands are used as grazing lands. Nearly all forest lands, and much of the steppes, are state-owned. All of the livestock that use these lands are privately owned. Most of the livestock are now owned by absentee owners. Access to most grazing lands is *de facto* open access, negating any possibility of management. Range management can only be effective if local populations and livestock owners are involved, but participatory management approaches are very poorly developed and no proven participatory forest and/or range management systems have been developed. A 1976 law gives 100% of forest revenues from authorized forest products to local government further complicating participatory management initiatives. Other constraints include a sectoral approach focusing on management for wood products, legal/policy constraints, insufficient capacities for participatory management, low political commitment and the lack of a Red List of endangered species.

Constraints to the conservation of marine and aquatic ecosystems. Coastal fishermen are rarely involved in the management of the coastal fisheries resource. There has been very little development of participatory management of marine and aquatic resources. Most coastal fisheries and freshwater aquatic ecosystems are quasi open access resources. This is especially true for the tidal zone fisheries. The state tries to regulate use, but lacks the means. Poor governance is a major constraint to the coastal fisheries sector. Law enforcement tends to favor the wealthy and artisanal fishermen are poorly organized, poorly informed and poorly represented in key fora. Industrial fishing boats commonly enter into coastal waters legally reserved for artisanal fishermen. The legal and policy framework has not been developed for participatory/co-management of coastal fisheries. There is no legislation allowing the granting of exclusive access rights over coastal fishing waters to organized groups of local artisanal fishermen. There is a major shortage of scientific expertise for marine ecosystems, ecology, biology, restoration**.** There is no one national institution with the capacity needed to define and implement national priorities and programs on marine biodiversity. There is no oceanographic institute. There is inadequate scientific information for most marine biodiversity/ecosystems (other than on fisheries).

Actions needed for enhanced conservation

Actions needed to better conserve terrestrial ecosystems and to overcome the identified constraints include support for the development of the economic potential of biodiversity resources, and the development of biodiversity product value chains wherever the sustainable management and regeneration of the resource can be ensured. Value chain development should seek to maximize the benefits to local communities/businesses and user groups in ways that create incentives for sustainable use. Legal and policy reforms are needed that favor local communities and local businesses as one of the principal beneficiaries of

commercial biodiversity products and that lay a sound basis for co-management of biodiversity resources on state-owned lands. Reform is needed to ensure the equitable sharing of benefits between local government and local resource managers/co-managers.

The development of participatory co-management systems for forest and range lands is a major need. On forest lands, commercial harvest rights for forest products should be conditional on sustainable range use systems that allow for natural forest regeneration. Grazing rights should be limited to local resident herders. Other actions needed include the development of improved knowledge management for forest/range conservation/sustainable use, the development of enhanced institutional capacities for participatory management, the development of civil society oversight and the certification of forests and forest products (cork, rosemary etc) to increase financial returns to community managers and others in the market chain.

Actions needed to better conserve marine biodiversity include the testing and development of participatory co-management systems of coastal marine resources. This should be done for coastal, artisanal fishing waters and for tidal zone fisheries. No-take-zone management techniques should be tested and enforced by community managers. Support should be given for the development of coastal and tidal zone fishery value chains wherever sustainable management of the resource can be ensured. Reforms are needed to develop clear policy and legal frameworks for participatory management approaches. A network of marine protected areas that cover the full range of marine and coastal ecosystems should be developed. Enhanced institutional and human resource capacities in the marine sciences are needed for the conservation and sustainable use of marine biodiversity.

Effectiveness of ongoing initiatives

Terrestrial ecosystem initiatives. Starting in 2006, the Forest Service (Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification, HCEFLCD) has launched an ambitious and innovative program of participatory approaches to forest management involving forest cooperatives and unions ("groupements") of forest cooperatives. Cooperatives are contracted as service providers and are given commercial harvest rights to timber products. In Kenitra Region, illegal forest use fell nearly 98% the first year where cooperatives conducted patrols and surveillance of the forest, showing how quickly attitudes of local people can change when they are offered a financial stake in the management and commercial use of the forest. The new partnerships present a wide array of opportunities for economic development in favor of impoverished rural populations, for improved biodiversity conservation and for improved governance. A shortcoming of the initiative is that it is being done with a short term perspective and not as a step towards long term co-management of resources. There are numerous opportunities for improving value chains of biodiversity products that are presently harvested as open access goods – such as acorns, mushrooms, truffles, etc. A USAID project has provided rosemary value chain development support to a forest cooperative awarded a long term contract for rosemary harvest rights on 22,000 ha near Oujda.

The UNDP/GEF Transhumance & Range Management Project is the only initiative identified that is working on the development of range management systems for the extensive steppe ecosystems of Morocco. It targets the restoration of traditional range management systems that have broken down. The transhumant herders have been organized and structured around their traditional tribal land rights. The initiative is, by accounts of all stakeholders, a very promising initiative, but it is still a "fragile" success story.

A new UNDP/GEF Middle Atlas Integrated Forest Ecosystem Management Project seeks to reverse the major threat to the forest ecosystems, that of severe over-grazing, through the development of range and forest co-management systems in two pilot communes of the Middle Atlas. The pilot communities will be structured and empowered to harvest/market forest products based on management plans. In return, they must adopt range management practices that ensure the natural regeneration of the forest – regeneration that is largely absent at present. The co-management system is to become self-financing -- the community managers will be required to reinvest part of their revenues to cover natural resource management costs. The

project could benefit from assistance on value chains and gives major opportunities for intensifying forest management.

Marine ecosystem initiatives. The Assessment Team was only able to identify one single initiative whereby local fishermen were directly involved in coastal fisheries management. This is the experience of the Oualidia Women's Clam Cooperative in the Oualidia Lagoon south of El Jadida. The cooperative received exclusive rights to two hectares of the lagoon suitable for the production of clams. The two hectares was leased from the government. Management was very simple but very productive -- it consisted of enrichment and protection. The area was enriched with tiny clams either collected locally or purchased. A guard was hired to prevent unauthorized entry into the two hectares. The adult clams were harvested in December when export prices reach their highest levels. The initiative worked very well until it came to a sudden demise because of pollution buildup in the lagoon – a factor external to the women's cooperative. Other initiatives include the government's program to concentrate all artisanal fishermen in the country into 60 fishing villages and the expansion of the marine components of the Protected Areas network.

Country Assistance Strategy. The four USG priority assistance goals as defined in the September 11 draft of the Country Assistance Strategy are the following:

1. Mitigate drivers of youth disaffection and marginalization;
2. Reduce poverty and increase economic growth;
3. Expand democratic reform and improve governance;
4. Reinforce peace and security.

As formulated, none of these goals are expressly or directly linked to the actions needed for biodiversity and forest conservation in Morocco. The goals of the CAS neither support nor hinder biodiversity and forest conservation. The impact of the CAS on biodiversity conservation will depend on how the CAS goals are translated into concrete actions/programs by USAID, MCC and others. The CAS identifies a number of policy constraints, but did not include the long-standing policy that favors the elite over local populations as a constraint to economic development and to improved governance in rural areas and in value chains that are based on the products of biodiversity and forests.

Analysis of ongoing projects/programs

The USAID program. A USAID-funded project called The Integrated Agriculture and Agro-Business Project is working with the sheep/mutton marketing chain in eastern Morocco (Orientale). There is some possibility of a perverse effect that increased financial returns to sheep owners will lead to increased numbers of investors in sheep grazing and/or increased numbers of sheep on the rangelands and increased degradation of the range and its biodiversity. This needs to be monitored and corrected as necessary.

The same project has another innovative and highly promising initiative in the same zone targeting the rosemary value chain. The project has worked with the Forest Service and local communities, and a rosemary producer cooperative covering several villages has been formed. They have been given a long-term contract for harvesting rosemary on a 22,000 hectare tract. The cooperative takes responsibility for self-policing – the contract with them specifies that they can lose their harvest and marketing rights if they do not respect their contractual obligations. This is reported to be working very well. This is an initiative that can serve as a basis for developing co-management systems that provide a sustainable basis for rural economic development.

The MCC Compact program will fund the conversion of sloping, marginal cereal fields to terraced orchards. Some of the smallholders targeted also raise livestock, especially small ruminants. The conversion of fields to orchards will decrease the on-farm availability of forage and could lead to increased livestock pressures on forest and steppes in situations where they exist nearby. This danger will need to be closely

analyzed by the thematic environmental impact assessment to be done and mitigating measures will need to be undertaken where necessary; some of these measures have already been put in place by the MCC program.

The MCC is also funding the development of some of the new fishing villages and improvements to the coastal fisheries value chains. This could potentially lead to increased pressures on the coastal fisheries resource, although it appears that MCC may have taken adequate measures to avoid that. The thematic EIA for this coastal fisheries component will need to take a fresh look at this risk.

The MCC fisheries component includes a research component for the testing of no-take-zones as a coastal fisheries management technique. The Assessment team believe that this is a highly appropriate innovation that could well prove to be a very effective technique for both increasing the sustainable off take and for improving marine biodiversity conservation. No take zones generally only work where fishermen self-police themselves to ensure that no fishing is done is these mini protected areas. It is an appropriate technique for participatory coastal fisheries management.

Opportunities for USG Support

The Assessment Team believes that there are many opportunities for linking biodiversity and forest conservation to two of the CAS goals:

Goal 2: Reduce poverty and increase economic growth
Goal 3: Expand democratic reform and improve governance.

Furthermore, the Team believes that the greatest opportunities are to be found in projects that combine both goals, with economic opportunities providing the base on which to integrate improved governance. There are many economic development activities to be found amongst a variety of biodiversity-based value chains that are based on forest, range and coastal ecosystems. Many of the biodiversity-based value chains have the potential for contributing to economic development favoring some of Morocco's most impoverished people. This is certainly true for value chains based on mountainous forest and grassland ecosystems and is also often true for coastal artisanal fisheries and tidal zone fisheries.

The main challenges for economic development based on biodiversity-based value chains are two-fold:

- They must be based on sustainable use or management of the species that the biodiversity product comes from. The species is part of an ecosystem, so the ecosystem itself must meet minimum requirements for ecological integrity and sustainable use
- Sustainable use requires that there must be an empowered management authority with control over the resource, with the technical capacities for sustainably managing resources. Government agencies generally can't do this without involving local resources users. Herein lays the greatest opportunity and the greatest challenge – to support the development of new management systems that directly involve local resources users in the management of the resources while making them the principal financial beneficiaries of the commercial uses of the resources.

Opportunities linked to terrestrial biodiversity conservation. Some of the options that could be supported are the following:

- Replication of the support for the rosemary value chain to other sites. This would be relatively low risk.
- Development of a full participatory management system on the 22,000 has covered by the rosemary cooperative near Oujda. This would build on the present success story to develop management systems to include all of the biodiversity products from these steppe ecosystems while integrating watershed function, tourism development and any other opportunities. It would include a range management component. This involves a higher level of risk that cannot be determined without assessing the specific conditions on site.

- Support to participatory development of biodiversity product value chains in conjunction with the Forest Service's program of payments to communities for excluding livestock from forest areas targeted for regeneration and their program for supporting forest cooperatives as service providers and as timber cutters and merchants. There are many opportunities here for biodiversity product value chain development in favor of the forest cooperatives and of measures that assist in movement towards co-management systems – without directly trying to develop full-blown co-management systems upfront. Such an approach would be relatively low risk because it does not necessitate the near term development of range management systems.
- Support for full-blown co-management systems of forest and rangelands. This is the ultimate destination that one wants to achieve. One could directly target the development of such co-management systems. USAID has been a leader in the development of such systems on the continent. Co-management systems would normally include a sizable range management component. Direct targeting of co-management systems would involve a moderate to moderately high level of risk.

The best opportunities for linkage biodiversity/forest conservation with the water sector is in the area of watershed management targeting enhanced, participatory management of forest and/or range lands with a strong emphasis on biodiversity value chain development. The Assessment Team developed a substantial, partial list of potential value chains.

Opportunities linked to enhanced marine biodiversity conservation

Fisheries co-management. The main opportunities identified for marine ecosystems are in the involvement of local fishermen in the management of coastal and tidal zone marine resources. The MCC/APP Compact already includes the testing of no-take-zone fisheries management technique for coastal waters. The Team believes that the only way for this technique to be effective is through the self-policing by empowered fishermen's groups. APP should seek to test this in the context of co-management systems for coastal waters. They should do this under a variety of ecological and socio-economic conditions. They need to find legal mechanisms for empowering fishermen's cooperative to either have exclusive access rights to coastal fishing waters with well-defined limits, or, at a minimum, to be able to impose rules and regulations on all who use the fishing waters that they have been given control over.

Co-management of tidal zone marine resources. Likewise, there is an opportunity for APP to test the development of participatory management systems for tidal zone resources. This is an activity that would best be undertaken with women's cooperatives. APP has a gender component that would seem to be ideally suited for supporting tidal management by women's cooperatives. Again, a legal mechanism for empowering women's cooperatives over sections of the tidal zone would need to be identified.

SOMMAIRE

Cette évaluation sur la biodiversité et les forêts au Maroc a été menée pour informer les autorités compétentes chargées de la préparation de la Stratégie d'Assistance au Pays (Morocco Country Assistance Strategy ou CAS) du gouvernement américain, et ce, conformément à la loi américaine sur l'Assistance Étrangère (Sections 118 et 119). En particulier l'alinéa 119.d requiert que l'évaluation comprenne une analyse:

1. des actions nécessaires pour la conservation de la biodiversité marocaine ; et
2. à quel point les actions proposées, pour être soutenues par l'Agence Américaine pour le Développement International, satisfont aux besoins identifiés.

L'identification des opportunités offertes au gouvernement américain d'avoir, à travers ses programmes d'assistance, des impacts positifs sur la conservation de la biodiversité au Maroc constitue l'ultime étape d'un processus analytique comportant:

- un aperçu sur la biodiversité du pays et ses forêts ;
- l'identification des menaces sur ce patrimoine naturel et leurs causes profondes ;
- l'identification des contraintes à une conservation efficiente de ce patrimoine naturel ;
- l'identification des besoins et des actions nécessaires pour pallier à ces contraintes ;
- l'analyse de la concordance entre les initiatives de conservation en cours et les actions nécessaires ;
- l'analyse de la mesure dans laquelle la Stratégie d'Assistance au Pays (CAS), et les programmes en cours du gouvernement américain, peuvent contribuer à ou entraver la conservation de la biodiversité et des forêts du Maroc ;
- l'identification des opportunités offertes au gouvernement américain pour contribuer à la conservation de la biodiversité du Maroc et de ses forêts dans le cadre du CAS.

Aperçu sur la biodiversité marocaine

Le Maroc abrite la deuxième plus riche biodiversité terrestre du bassin méditerranéen et la plus riche diversité biologique marine. Le Maroc a une diversité spécifique de plus de 31,000 espèces dont 11% environ sont endémiques ; le taux d'endémisme de la flore vasculaire étant de 20%. La stratégie du développement socio-économique du Maroc est essentiellement basée sur ses ressources en biodiversité des secteurs agricole, forestier et marin. Le Maroc a aussi un nombre exceptionnel de formes sauvages apparentées des cultures domestiquées. Tous les écosystèmes sont sous pression et la plupart sont modérément à très dégradés. Le nombre total d'espèces menacées au Maroc est estimé à au moins 2,280 taxa largement dominées par les formes terrestres. Les espèces végétales, en particulier, constituent, plus que 80% de la biodiversité menacée du Maroc.

Il y a dix parcs nationaux au Maroc dont trois comprennent des espaces maritimes à l'intérieur de leurs limites. 160 Sites d'Intérêt Biologique et Écologique (SIBE's) ont été identifiés dans une étude nationale des écosystèmes du pays ; certains de ces SIBE's sont en cours d'être hissés au rang « d'aires protégées». Toutes les aires protégées et toutes les forêts sont habitées par des populations qui pratiquent l'agriculture et l'élevage et qui font la récolte de divers produits forestiers. Les milieux marins sont faiblement représentés dans ce réseau national des aires protégées.

Menaces sur la biodiversité

Menaces sur la biodiversité terrestre. Presque toutes les forêts appartenant au domaine forestier et tous les bassins versants sont très fortement sur-pâturés. Dans beaucoup de régions, le surpâturage empêche toute régénération des forêts, favorisant ainsi le phénomène d'érosion, le compactage du sol et la dégradation des bassins versants. L'élevage dans ces espaces est caractérisé par un « accès libre » aux ressources considérées comme « un bien propre » que personne ne paie pour utiliser et personne, parmi les usagers, n'investit dans sa bonne gestion.

Le surpâturage est une cause majeure de la dégradation des bassins versants. Le bois de chauffe ainsi que beaucoup de produits non-ligneux sont très sévèrement, et souvent illégalement, surexploités. Les autres menaces identifiées dans les zones boisées correspondent essentiellement à la fragmentation des habitats, le changement climatique, la conversion en terres agricoles ou en zones urbaines/zones développées, les incendies de forêts ainsi que l'introduction dans le pays d'espèces exotiques envahissantes.

Menaces sur les milieux marin et côtier et les eaux continentales. La surpêche et la surexploitation de la biodiversité marine et côtière constituent la principale menace pesant sur le domaine marin. Le drainage des eaux, le développement et l'urbanisation constituent également d'importantes menaces sur les zones humides continentales et les écosystèmes côtiers. La fragmentation d'habitats due à la construction de barrages est une menace majeure dans les cours d'eau et les zones humides continentales. La pollution menace beaucoup d'écosystèmes aquatiques continentaux et des milieux marins et côtiers. Les autres menaces correspondent à l'introduction d'espèces exotiques envahissantes, les changements climatiques et le braconnage.

Contraintes à une conservation efficace de la biodiversité

Contraintes à la conservation des écosystèmes terrestres. Le système de droit foncier fournit peu de motivations aux populations locales pour conserver la forêt. Les lois régissant la récolte commerciale et la vente de produits de la biodiversité de terres domaniales ont presque systématiquement exclu les communautés locales et les usagers de la ressource de ces avantages. Les produits commerciaux objets de l'adjudication forestière sont récoltés presque toujours par les élites relativement aisées ; ceux qui vivent à l'intérieur ou à proximité des forêts sont généralement exclus systématiquement des avantages financiers directs des produits de ces forêts. Presque toutes les terres forestières sont utilisées comme pâturages. Presque toutes les forêts et beaucoup de steppes font partie des terres domaniales. Tout le cheptel pâturant dans ces terres appartient à des personnes privées et nombreux de ces « usagers » ne font pas partie des populations locales. L'accès à la plupart des terres du pâturage est plus ou moins libre, ce qui rend impossible une gestion rationnelle. La gestion des parcours ne peut être efficace que si les populations locales et propriétaires du cheptel sont impliqués, mais les approches de la gestion participative sont très peu développées et il ne semble pas qu'une telle approche ait été développée pour la gestion de la forêt ou des terres de parcours. La loi de 1976 donne 100% des recettes de l'exploitation forestière aux autorités locales, ce qui compromet sérieusement toute initiative participative et de gestion rationnelle par les autorités compétentes. Les autres contraintes correspondent à l'approche sectorielle qui se focalise sur les produits en bois, aux contraintes législatives et institutionnelles, à l'insuffisance des capacités pour une gestion participative, à un engagement politique insuffisant et, aussi, à l'absence d'une liste rouge des espèces menacées à protéger et à valoriser.

Contraintes à la conservation de la biodiversité des écosystèmes marins et aquatiques. La principale contrainte réside dans le fait que les pêcheurs côtiers sont rarement impliqués dans la gestion de la ressource ; il y a eu très peu d'exemples de développement de gestion participative de la ressource aquatique. L'accès est quasiment ouvert aux ressources des écosystèmes côtiers et d'eau douce. C'est particulièrement vrai pour les pêches dans les zones de balancement des marées. Les instances compétentes essaient d'en régler l'usage, mais manquent de moyens. La mauvaise gouvernance est une contrainte majeure au développement du secteur de la pêche côtière. Le non-respect de loi a tendance à favoriser les pêcheurs aisés, alors que les pêcheurs artisanaux sont relativement peu organisés, peu informés et peu représentés dans les instances consultatives.

Les cadres législatifs et institutionnels ne semblent pas avoir été conçus pour le développement d'une approche participative et de cogestion. Il ne semble également exister aucune loi qui donne le droit d'accès exclusif à la pêche dans les eaux réservées à la pêche côtière à des groupes organisés de pêcheurs artisanaux locaux. Il y a aussi de grandes insuffisances de compétences scientifiques dans l'étude des écosystèmes marins, leur écologie, leur restauration, etc. Il n'y a également aucune institution nationale disposant des moyens, de la compétence et de la prérogative de définir les besoins et de mettre en œuvre les programmes nécessaires pour développer les priorités nationales en matière d'étude, de valorisation de la biodiversité en générale et de la biodiversité marine en particulier. Il n'existe pas d'institut océanographique, proprement dit, et les informations scientifiques sur les écosystèmes marins/biodiversité marine (autres qu'halieutiques) sont très limitées.

Les actions nécessaires pour améliorer la conservation de la biodiversité

Les actions nécessaires pour mieux conserver les écosystèmes terrestres et surmonter les contraintes identifiées comprend l'appui au développement des filières de la biodiversité là où on peut assurer la gestion durable de la ressource et sa régénération. Le développement de ces filières devrait avoir comme priorité d'optimiser les avantages économiques au profit des communautés/entreprises locales et des groupes d'usagers afin de créer des motivations économiques pour une gestion et une utilisation durables. Des réformes législatives et institutionnelles sont donc nécessaires pour faire en sorte que les populations et entreprises locales soient parmi les principaux bénéficiaires du commerce des produits de la biodiversité, et pour créer une base solide pour une cogestion des ressources de la biodiversité. La réforme est également nécessaire pour assurer un partage équitable des avantages entre les autorités locales et les gestionnaires ou co-gestionnaires locaux des ressources.

Le développement de systèmes de cogestion participative des ressources naturelles est un besoin majeur. Dans les milieux forestiers, les droits d'exploitation forestière devraient être soumis à de strictes conditions de bonne gestion de parcours afin d'assurer la régénération forestière naturelle. Le droit de pâturage devrait être limité aux seules populations résidentes locales. Parmi les autres actions nécessaires, on peut citer le développement des capacités de gestion de connaissances sur la conservation des forêts et des steppes et leur utilisation durable, l'amélioration des capacités institutionnelles pour une gestion participative des ressources, le développement d'un suivi de la part de la société civile et la certification de forêts et produits de forêt (liège, romarin, etc.). Toutes ces actions permettent d'augmenter les recettes financières des gestionnaires communautaires et des autres agents des filières concernées.

Les actions nécessaires pour une meilleure conservation de la biodiversité marine concernent l'essai et le développement de systèmes de cogestion participative des ressources biologiques marines et côtières. Ceci devrait être testé pour les eaux de la pêche côtière artisanale ainsi que celle pratiquée dans la zone de balancement des marées. La mise en place de zones de protection intégrale (zéro prises) devrait également être testée comme technique de gestion contrôlée par les communautés locales. Il faudrait également appuyer le développement des filières de pêche des zones côtières et la zone des marées partout où on peur assurer la gestion durable des ressources halieutiques. Les réformes nécessaires correspondent au développement de politiques claires et de structures légales pour la mise en place d'approches participatives de cogestion. Un réseau d'aires marines protégées représentant tous les écosystèmes marins et côtiers devrait être développé. Il y a également un besoin important de développement et de renforcement des connaissances, des capacités et des compétences humaines en matière de conservation et d'utilisation durable de la biodiversité marine.

L'efficacité des initiatives en cours

Initiatives dans le domaine terrestre. Le département chargé de la gestion des Forêts (Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification ou HCEFLCD) a lancé en 2006 un programme ambitieux et innovateur d'approches participatives pour la gestion des forêts, qui implique les coopératives et les groupements de coopératives dans le domaine forestier. Les coopératives sont contractantes comme

prestataires de service et jouissent de droits d'exploitation forestière. Depuis que les coopératives ont commencé à organiser des patrouilles de surveillance de la forêt dans la Région de Kénitra, les délits forestiers ont chuté de près de 98% dès la première année, prouvant ainsi que les attitudes des populations locales peuvent changer quand celles-ci reçoivent des revenus de la gestion ou de l'usage commercial des forêts. Les nouvelles approches partenariales présentent de nombreuses occasions pour le développement économique en faveur de populations rurales démunies, pour la conservation de la biodiversité et pour l'amélioration de la gouvernance. L'inconvénient de l'initiative est qu'elle est conçue pour des perspectives de court terme et non pas comme une étape vers une cogestion à long terme de la ressource. Il y a de nombreuses opportunités pour améliorer la valeur des filières des produits de la biodiversité qui sont exploitées pour l'instant comme biens d'accès ouvert, notamment les glands, les champignons, les truffes, etc. Un projet USAID a fourni l'appui nécessaire au développement de la filière-romarin par une coopérative de forêt avec un contrat à long terme pour les droits de la récolte et la valorisation du romarin sur 22,000 ha dans une région proche d'Oujda**.**

Le projet PNUD/GEF sur la transhumance et sur la gestion de parcours est la seule initiative identifiée qui travaille sur le développement de systèmes de gestion du pâturage dans les vastes écosystèmes steppiques du Maroc. Il vise la restauration de systèmes de gestion traditionnels et ancestraux qui ont quasiment disparus. Ces approches de transhumance ont été organisées et structurées autour de droits d'usage tribal et traditionnel des populations. L'initiative est, de l'avis de tous les acteurs, une grande réussite et très prometteuse, mais demeure encore "fragile".

Un nouveau projet PNUD/GEF de la gestion intégrée des écosystèmes forestiers dans le Moyen Atlas cherche à renverser la tendance de la menace majeure qui pèse sur les écosystèmes forestiers dans cette région, à savoir le surpâturage excessif, à travers le développement de systèmes de cogestion de la forêt et des parcours dans deux communes pilotes. Les communautés seront structurées et autorisées à exploiter /commercialiser les produits forestiers sur la base de plans d'aménagement. En contrepartie, les populations doivent adopter des pratiques de gestion de parcours qui assurent une régénération naturelle de la forêt ; régénération qui est en grande partie absente aujourd'hui. Le système de la cogestion devrait être autofinancé et les gestionnaires communautaires devraient réinvestir une partie des recettes pour payer les coûts de la gestion de la ressource naturelle. Le projet pourrait bénéficier d'assistance pour le développement des filières de produits de la biodiversité, et offre des opportunités importantes pour intensifier la gestion de forêt.

Initiatives concernant les écosystèmes marins. L'équipe chargée de l'évaluation n'a pu identifier qu'une seule initiative permettant aux pêcheurs (ramasseurs) locaux d'être impliqués directement dans la gestion des ressources côtières. Il s'agit de l'expérience de la Coopérative féminine pour l'exploitation de la palourde dans la lagune d'Oualidia au sud d'El Jadida. La coopérative a eu des droits exclusifs pour l'exploitation d'une concession de deux hectares de la lagune pour la production de la palourde. Ces deux hectares ont été loués aux instances gouvernementales compétentes (Département de l'équipement). Avec une gestion assez simple, par ensemencement du naissain ramassé sur place ou acheté d'ailleurs et protection de la parcelle louée, la coopérative a obtenu de bons résultats. Un garde a été recruté pour prévenir l'entrée non autorisée dans les deux hectares alloués. Les palourdes adultes sont récoltées et commercialisées au mois de décembre quand les prix de l'exportation sont à leurs plus hauts niveaux. L'initiative a très bien réussi mais a du être interrompue à cause d'un accroissement de la pollution à l'intérieur de la lagune et donc l'insalubrité du produit devenu impropre à la commercialisation. C'est un facteur externe à l'initiative et à la démarche de la cogestion. D'autres initiatives concernent le programme gouvernemental visant à regrouper tous les pêcheurs artisanaux éparpillés dans certaines plages du Royaume, dans 60 villages de pêche, et l'extension côté marin du réseau d'aires protégées.

Stratégie d'Assistance au Pays (CAS). Les quatre buts de l'assistance préconisée par le gouvernement américain, telles que définies dans l'avant projet de la Stratégie d'Assistance au Pays (CAS) datant du 11 septembre 2008, sont les suivants :

1. atténuer les causes de mécontentement des jeunes et de leur marginalisation ;
2. réduire la pauvreté et augmenter la croissance économique ;

3. étendre la réforme démocratique et améliorer la gouvernance ;
4. renforcer la paix et la sécurité.

Comme sus mentionné, aucun de ces buts n'est lié formellement ou directement aux actions dont le Maroc a besoin pour la conservation de sa biodiversité et ses forêts. Les buts du CAS ne supportent ni n'entravent la conservation de la biodiversité et des forêts. L'impact du CAS sur la conservation de la biodiversité et des forêts du Maroc dépendra des actions/programmes spécifiques mis en œuvre par l'USAID, le MCC et autres agences de coopération pour atteindre les buts du CAS. Le CAS a identifié plusieurs contraintes politiques au développement économique et à l'amélioration de la gouvernance. Mais la politique forestière qui favorise les élites pour toute exploitation forestière, au détriment des populations locales, ne figure pas parmi les contraintes politiques identifiées, bien qu'elle soit une contrainte principale au développement économique et à l'amélioration de la gouvernance en milieu rural et dans les filières basées sur les produits de la biodiversité et des forêts.

Analyse des projets/programmes en cours

Le programme de l'USAID. Le projet «The Integrated Agriculture and Agro-Business Project», financé par l'USAID, travaille dans la filière «viande de moutons» dans l'Oriental. Comme effets pervers du projet, l'augmentation des recettes financières des éleveurs de moutons pourrait encourager encore plus d'investissement dans le domaine de l'élevage des moutons, ce qui conduirait à la croissance du cheptel et augmenterait la pression de pâturage sur les zones en question et leur biodiversité. D'où la nécessité d'un suivi et une surveillance soutenus afin de pouvoir «rectifier le tir » en cas de besoin.

Le même projet a une autre initiative innovatrice et assez prometteuse qui vise la filière du « romarin » dans la même zone. Cette dernière consiste en l'octroi, par le HCEFLCD, du droit exclusif de l'exploitation du romarin sur près de 22,000 hectares de zones steppiques à une coopérative couvrant plusieurs villages dans ces zones. C'est une relation contractuelle qui responsabilise la coopérative sur la conservation et l'utilisation durable de la ressource sous peine de perdre les avantages que leur procure le contrat en termes de récolte et de commercialisation du produit. Jusqu'à présent, cette relation contractuelle semble donner satisfaction aux deux parties contractantes. L'initiative pourrait donc servir de modèle pour le développement d'approches de cogestion des ressources naturelles compatibles avec un développement économique rural durable.

Le Programme du Millenium Challenge Corporation (MCC) au Maroc est destiné, entre autres, à financer la conversion des champs céréaliers marginaux et inclinés en vergers disposés en terrasses. Le programme cible aussi certains petits cultivateurs qui s'occupent également de l'élevage, particulièrement des petits ruminants. La conversion de champs en vergers diminuera la disponibilité de fourrage et pourrait, par conséquent, mener à une augmentation de la pression du bétail sur la forêt et les steppes voisines. C'est un risque qui devrait être pris en considération dans les études d'impact sur l'environnement afin que les mesures appropriées d'atténuation des impacts soient préconisées ; certaines mesures, comme celles qui encouragent les populations de s'adonner à des cultures de fourrages et des cultures alternatives, ont d'ailleurs déjà mises en place par le programme du MCC.

Le programme MCC appuie aussi le développement de certains nouveaux villages de pêche programmés le long des côtes marocaines ainsi que l'amélioration de la filière pêche artisanale côtière. Ceci pourrait éventuellement augmenter la pression sur la ressource sachant que dans le programme du MCC, de nombreuses mesures ont été prises pour pallier à ces éventualités. L'évaluation des impacts environnementaux de cette composante du programme devrait étudier ce risque de près.

La composante MCC-pêche comporte un volet «recherche» sur la viabilité des « zones de protection intégrale » comme une technique de gestion des ressources halieutiques côtières. L'équipe de l'évaluation pense effectivement que c'est une technique très appropriée qui pourrait être très efficace aussi bien pour l'augmentation des prises que pour la conservation de la biodiversité marine et côtière. Le respect des « zones

de protection intégrale » ne peut généralement être efficace que si les pêcheurs font un autocontrôle pour s'assurer qu'on ne pêche pas dans ces zones. C'est une technique appropriée pour une gestion participative de la pêche côtière.

Opportunités pour un appui du gouvernement américain (USG)

L'équipe de l'évaluation estime qu'il existe de nombreuses opportunités liant la conservation de la biodiversité et de la forêt aux objectifs du CAS et plus particulièrement les suivants :

But 2 : Réduire la pauvreté et augmenter la croissance économique
But 3 : Étendre la réforme démocratique et améliorer la gouvernance.

L'équipe estime que les meilleures opportunités sont offertes par des projets qui combinent les deux buts, en fournissant des opportunités économiques moyennant une amélioration de la gouvernance. On trouve en effet beaucoup d'activités de développement économique au sein de filières basées sur la biodiversité et les ressources forestières. En outre, plusieurs de ces filières sont bien placés pour contribuer au développement socio-économique des populations les plus démunies du Maroc. C'est le cas notamment des filières basées sur les ressources forestières de montagne et de plaine et aussi des filières basées sur la pêche artisanale, côtière et dans la zone de balancement des marées.

Le développement économique fondé sur les filières basées sur la biodiversité doit relever deux types de défis majeurs :

1. Ces filières doivent être basées sur l'utilisation durable ou la gestion durable de l'espèce dont le produit est dérivé. L'espèce fait partie d'un écosystème, donc l'écosystème lui-même doit satisfaire à des exigences minimales pour l'intégrité écologique et l'utilisation durable ; et

2. L'utilisation durable nécessite l'existence d'une structure autorisée pour le contrôle de la ressource et disposant des capacités techniques adéquates pour une gestion durable de la ressource. Les instances et structures étatiques ne peuvent généralement pas assurer ce rôle sans l'implication des populations locales et les usagers de la ressource. La plus grande opportunité, mais également le plus grand défi, résident dans la capacité d'appuyer et de soutenir le développement de nouveaux systèmes de la gestion qui impliquent directement les usagers locaux des ressources naturelles en tant que principaux bénéficiaires financiers de l'usage commercial de ces ressources.

Les opportunités liées à la conservation de la biodiversité terrestre. Parmi les options qui pourraient être envisagées, on peut citer les options suivantes:

- Extrapoler l'expérience de la filière « romarin » dans l'Oriental à d'autres sites. Les risques de cette option sont relativement faibles ;

- Développer un système de gestion participative sur les 22,000 ha couverts par les activités de la « coopérative romarin » près d'Oujda. S'appuyant sur l'expérience réussie actuelle, il s'agirait de développer des systèmes de gestion englobant tous les produits de la biodiversité de l'écosystème steppique de la région, tout en intégrant les fonctions de bassin versant, gestion de parcours, développement du tourisme rural, et autres. Le niveau de risque serait plus élevé, mais ne pourrait pas être précisé sans une analyse des conditions spécifiques propres du site ;

- Appuyer le développement participatif des filières des produits de la biodiversité conjointement aux programmes du HCEFLCD qui consistent à compenser les populations locales pour l'exclusion du cheptel des aires forestières visées par des projets de régénération, ou encore les programmes menés avec les coopératives en tant que prestataires de services et en tant qu'agents

qui exploitent et commercialisent des produits forestiers. Il y a là de nombreuses opportunités pour le développement de filières de produits de la biodiversité au profit des coopératives de forêt et de mesures de gestion participative permettant à plus ou moins long terme la mise en place de systèmes de cogestion. Le risque serait relativement faible tant qu'il n'inclut pas le développement, dans le court terme, de systèmes de gestion de parcours ;

- Soutenir le développement de systèmes de cogestion des forêts et des parcours, ce qui constitue l'objectif ultime à viser. On pourrait cibler directement le développement de tels systèmes de cogestion. L'USAID a été leader dans le développement de tels systèmes sur le continent. Les systèmes de cogestion à développer devraient avoir des composantes importantes de gestion de parcours. Cibler directement des systèmes de cogestion impliquerait un niveau de risque moyen à moyennement élevé.

Les meilleures opportunités de joindre entre la conservation de la biodiversité et des forêts et une meilleure gestion de la ressource en eau se situent au niveau de la gestion des bassins versants, notamment la gestion participative de forêt et/ou de parcours mettant l'accent sur le développement de filières basées sur des produits de la biodiversité. L'équipe de l'évaluation a développé une liste partielle des filières potentielles.

Les opportunités liées à l'amélioration de la conservation de la biodiversité marine

Cogestion des pêches. Les principales opportunités identifiées pour les écosystèmes marins et côtiers résident dans la participation de pêcheurs locaux à la gestion des ressources de la zone côtière et celle de balancement des marées. Le projet MCC/APP (Agence pour le Partenariat pour le Progrès) comporte déjà un projet pilote sur les « aires de protection intégrale » comme une technique de gestion durable des ressources halieutiques côtières. L'équipe estime que cette technique ne peut réussir que si les pêcheurs locaux sont organisés et responsabilisés, et contrôlent l'utilisation de la ressource. L'APP devrait tester cette approche dans le contexte de systèmes de cogestion pour les eaux côtières et ceci pour une gamme de conditions écologiques et socio-économiques. Ce qui nécessiterait la mise en place de mécanismes légaux pour octroyer à une coopérative de pêcheurs soit l'accès exclusif à certaines aires de pêches bien délimitées soit, à défaut, le droit d'imposer des réglementations et règles de bonnes pratiques à tous ceux qui utiliseraient ces aires de pêche.

Cogestion des ressources de la zone de balancement des marées. Il existe également de réelles opportunités pour l'APP de tester le développement de systèmes de gestion participative des ressources de la zone de balancement des marées. Une telle activité serait mieux entreprise avec et par des coopératives de femmes. L'APP dispose d'une composante « genre » qui semble parfaitement adaptée pour appuyer la mise en œuvre d'une activité de gestion de la zone de balancement des marées avec la participation active des coopératives de femmes. Là aussi, il serait important de mettre en place un mécanisme légal permettant aux coopératives féminines de disposer et de contrôler certaines aires bien délimitées de la zone de balancement des marées.

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LIST OF ACRONYMS

Abbreviations and acronyms have been kept to a minimum in the text of this document. Where abbreviations or acronyms have been used, they are accompanied by their full expression the first time they appear, unless they are commonly used and generally understood abbreviations such as NGO, kg., etc. However, in order to facilitate understanding of the acronyms used, a complete list is included here.

ADS	USAID's Automated Directives System
APP	Partnership for Progress Agency
BEO	Bureau Environment Officer
CAS	Country Assistance Strategy
CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resource Management
DH	Dirham (US$ 1 = approximately 8 DH)
EIA	Environmental Impact Assessment
ENFI	Ecole Nationale Forestière d'Ingénieurs
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the UN
GDP	Gross Domestic Product
GEF	Global Environment Facility
GTZ	Gesellschaft für Technische Zusammenarbeit
Ha	Hectare
HCEFLCD	Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification
HQ	Headquarters
IAV	Institut Agronomique et Vétérinaire Hassan II (Morocco)
IUCN	The World Conservation Union
MCC	Millennium Challenge Corporation
MEO	Mission Environmental Officer
NGO	Non-Governmental Organization
NP	National Park
PLACE IQC	Prosperity, Livelihoods and Conserving Ecosystems Indefinite Quantity Contract
RBA	Argon Forest Biosphere Reserve
RBIM	Mediterranean Intercontinental Biosphere Reserve
RBOSM	Southern Morocco Oases Biosphere Reserve
SIBE	Sites of Biological and Ecological Interest
SGG	Secrétariat Général du Gouvernement
TOR	Terms of Reference
UN	United Nations
UNCCD	United Nations Convention for Desertification Control
UNDP	United Nations Development Programme
UNEP	United Nations for Environmental Programme

USA	United States of America
USAID	United States Agency for International Development
USG	United States Government
WWF	World Wide Fund for Nature

1 INTRODUCTION

Context. USAID and other US government (USG) agencies are preparing a joint Country Assistance Strategy for Morocco. The Foreign Assistance Act (FAA) requires that the preparation of such a strategic planning document include a biodiversity assessment. For countries with tropical forests, strategic planning documents also must include a tropical forest assessment. Morocco does not have tropical forest *per se*. The very southern extremity of Morocco is in the tropics but this part of the country is in the middle of the Sahara desert and has only scattered small trees. In any case, the Bureau Environment Officer (BEO) in Washington assured the Assessment Team Leader that this makes little difference to the actual assessment, because the natural forest ecosystems need to be included in the biodiversity assessment.

The objective of the assessment as stated in the TOR is, *"To conduct a country-wide assessment of biodiversity and tropical forestry conservation needs and related issues for the purposes of complying with Sections 117, 118, and 119 of the Foreign Assistance Act of 1961, as amended, and Agency guidance on country strategy development, under ADS 201.3.8 and ADS 204.5. Based on this needs assessment, provide analysis of proposed actions under USAID's strategy to identify how they contribute to the conservation needs identified.*

The Foreign Assistance Act provides much more specific details of the objectives of the assessments. FAA Section 118(e) requires that such a country development strategy statement include an analysis of:

a) "The actions necessary in that country to achieve conservation and sustainable management of tropical forests, and;
b) "The extent to which the actions proposed for support by the Agency meet the needs thus identified."

FAA 119 (d) requires that such a plan should include an analysis of:

1) "The actions necessary to conserve biodiversity, and;
2) "The extent to which the actions proposed for support by the Agency meet the needs thus identified."

Administrative modalities and methodology. The assessment was funded by USAID under the PLACE IQC and was performed by ECODIT. ECODIT has put together a team composed of three very senior professionals for the assessment – an international consultant as team leader and two Moroccan professionals. In addition, a Moroccan GIS Specialist led the preparation of targeted maps for purposes of this assessment. Short biographical sketches of each are presented in ***Annex B***. The assessment was performed in September and October 2008. The team leader had meetings with USAID staff in Washington that included the outgoing and incoming Morocco desk officers, the BEO and ECODIT staff. The team began work in Morocco on September 14. A preliminary report was submitted on September 22 to meet the requirements for the completion of the CAS. The team made a power point presentation to mission staff on October 10, 2008 and submitted a Draft Final Report on October 21, 2008.

The identification of opportunities for the USG to have positive impacts on biodiversity conservation in Morocco is the final step of the following analytical process:

- Review of the biodiversity of the country;
- Identification of threats and root causes;

- Identification of the constraints to effective conservation;
- Identification of the actions needed to overcome these constraints.
- Analysis of the conservation initiatives underway in respect to actions needed;
- Analysis of the extent to which the CAS and ongoing USG programs contribute to, or hinder, biodiversity conservation; and
- Identification of opportunities for the USG to have positive impacts on biodiversity conservation within the general framework of the CAS.

Given the very short time, only a limited number of strategically chosen interviews could be held during the week before the submission of the Preliminary Report. The team sought especially to meet with individuals with the broadest knowledge and who have clear ideas on what needs to be done to improve biodiversity and forest conservation in Morocco. The team also relied strongly on their previous considerable experience. All key points were discussed as a team before agreeing upon the writing responsibilities. The findings and recommendations of the preliminary report have been crosschecked, modified, detailed, expanded and strengthened in this Final Report.

2 OVERVIEW OF THE BIODIVERSITY & ECOSYSTEMS OF MOROCCO

2.1 OVERVIEW

Moroccan biodiversity, particularly species diversity, is one of the richest of the whole Mediterranean basin. Morocco's very rich diversity of ecosystems reflects the wide range of biophysical conditions of the country. The surface area of Morocco's marine ecosystems is greater than its terrestrial area. They front the Atlantic Ocean to the west and the Mediterranean Sea to the north. The wealth of terrestrial ecosystems and habitats reflect the high diversity of bio-climatic and ecological conditions that comes with four mountain ranges in one country. Climatic conditions vary from the xeric (desert) to the humid. Morocco has a species diversity of more than 31,000 species. Eleven percent of Morocco's species are endemic, including 20% of the vascular flora (phanerogams). The biodiversity of Morocco also presents a strategic and vital socioeconomic opportunity for the country; it assures food, raw materials and recreation. Indeed, the national development strategy is founded on its agricultural, forest and marine biodiversity resources. Morocco has a rich genetic diversity of its agricultural crops and livestock that have evolved in adaptation to local conditions. Morocco also has an exceptional number of wild relatives of domesticated crops.

Exhibit 1 - Number of species by major category of ecosystems

(Source: National Biodiversity Conservation Strategy)

As is true throughout the Mediterranean hotspot region most of Morocco's ecosystems have suffered moderate to severe levels of degradation. The total number of threatened species for Morocco is estimated to be at least 2280 species. Threatened species are strongly dominated by its terrestrial taxa. Plant species, in particular, constitute, more than 80% of the Moroccan threatened species. The rest are composed of marine fauna (12%), continental wetland fauna (6%) and marine algae (1%).

The main components of threatened fauna and flora are graphically displayed in the following two exhibits:

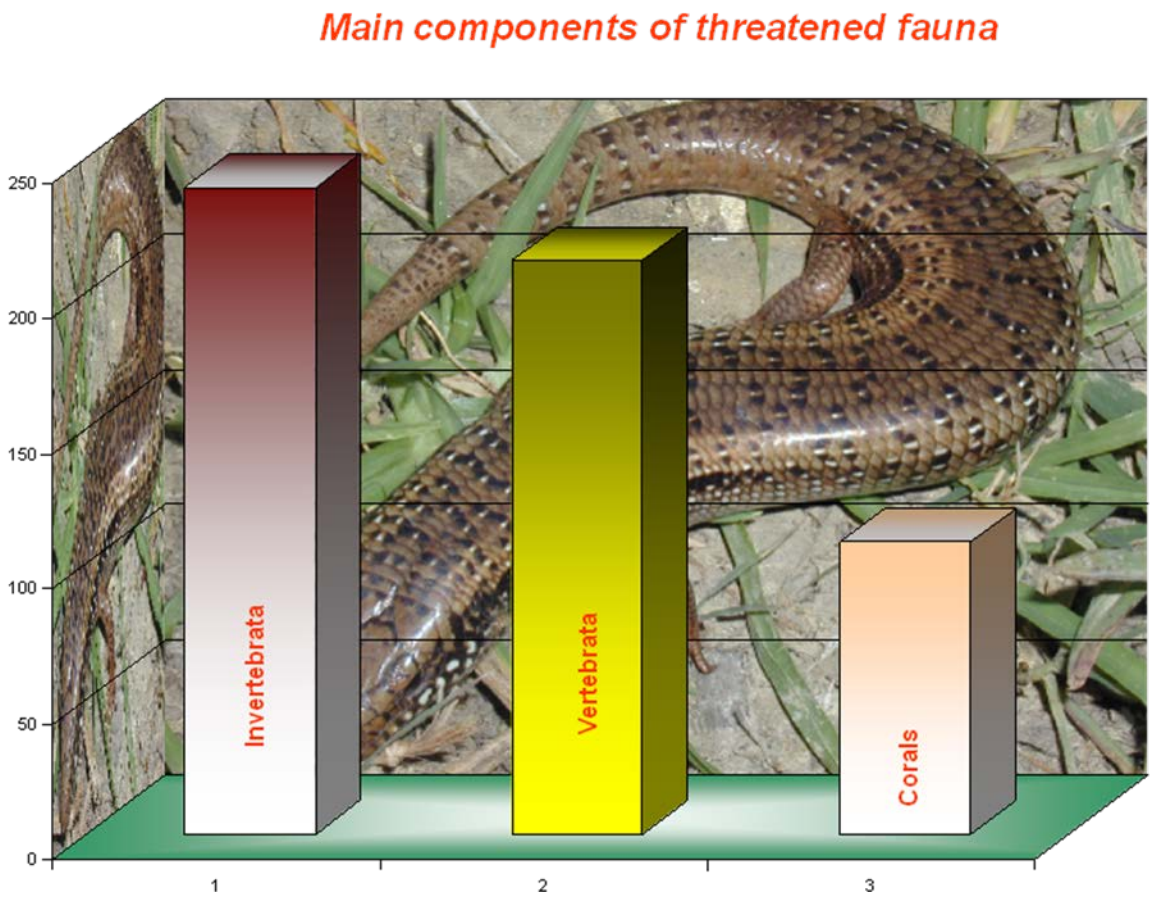

Exhibit 2 - Main components of threatened fauna

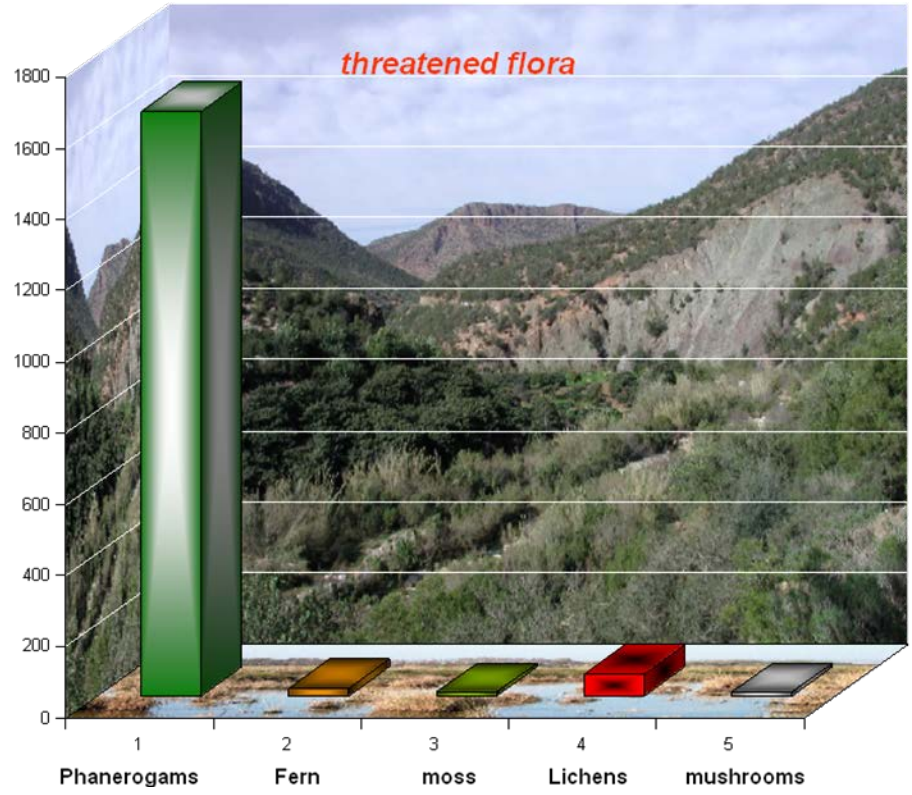

Exhibit 3 - Main components of threatened flora

2.2 DIFFERENT TYPES OF ECOSYSTEMS IN MOROCCO

Morocco, with a land area of 711,000 km², is the second most biologically diverse country in the Mediterranean basin. Because of its location and topography, there are extremes in climate, with negligible rainfall in the arid areas of the Sahara, and precipitation of 2,000 mms in the northern mountains with altitudes up to 4,000 m and permanent snow-cover. There are an estimated 4,000 species of vascular plants of which 209 are endemic, and 550 vertebrates including 101 mammals. 30 species of birds are endangered, while of Morocco's endangered plants 405 are endemic.

Thirty-nine different ecosystem[1] types have been identified, ranging from various forms of mountain and lowland forests, grasslands and wetlands to coastal lagoons, beaches and marine environments.

The principal threats to biodiversity are habitat transformation to agricultural and urban uses, fragmentation and unsustainable uses. Root causes include increasing population pressures, inequitable access to economic opportunity, and lack of effective, participatory management systems. 49% of Morocco's population is rural, but they account for 70% of the country's poor. Fuelwood remains a major source of domestic energy. Urbanization, industrialization and tourism in coastal areas have also transformed habitats. In general, less than 1% of the land area, and a much lower percentage of marine areas, currently comes under some form of protection.

[1] Etude des Aires Protégées du Maroc. AEFCS et BCEOM-SECA, 1995.

2.3 TERRESTRIAL ECOSYSTEMS

The terrestrial ecosystems can be grouped into three major categories (See ***Annex I*** for details):

Forest ecosystems [2]

Natural forest ecosystems are distributed among the different bioclimatic levels from semi-arid to humid and are dominated by the broadleaf trees Holm oak *(Quercus ilex*), cork oak *(Q. suber),* Tauzin oak, argon (*Argania spinosa)*, wild olive) and by the coniferous trees Atlas cedar (*Cedrus atlantica*), Aleppo pine (*Pinus halepensis)*, coastal pine, black pine (*P. nigra)* and sandarac (*Tetraclinis articulata*). Oak forests occupy the plains and the foothills of the mountains while the coniferous forests (cedar, coastal pine and black pine) are generally located at higher elevations. The only Moroccan fir tree species is found in the heights of western Rif Mountains in the region of Chefchaouen. In the south, endemic argon trees are found over large areas in the semi-arid and arid zones and constitute, with the acacias, the species most adapted to aridity. See ***Annex I*** for full details of forest ecosystems.

Saharan ecosystems

These ecosystems are characterized mainly by two *Acacia* species: *A. ehrenbergiana* and *A. raddiana*. These species of pre-steppic and pre-forest regions are found in arid and Saharan bioclimates. More than 130 species of Arthropods have been reported within these ecosystems. Two birds species are very characteristic of these zones: the bald craterope (*Turdoides fulvus)* and southern 'pie-grieche' (*Lanius meridionalis)*. Numerous animal species characterize these ecosystems. Arachnids are well-represented by scorpion species (genus *Buthus, Androctonus and Scorpio*) frequenting all types of environments and which can be locally very abundant. Many families of Arachnids live under rocks or weave their webs on vegetal clumps. Solifuges are great predators of insects and are represented especially by several species of the genus *Galeodes*. Insects are particularly numerous -- Coleopterans (more than 500 species), Hymenopters (more than 100 spp.) Lepidopters and Dipters (more than 50 for each group) Orthopters (at least 40 spp.). Several other orders are each represented by less than 20 species.

Four amphibian species are found in humid environments of the Brongersma toad is endemic to Morocco. About 40 species of reptiles, or almost a third of the total number of species in the country, are found in the Saharan ecosystems. *Tarentola boehmei* is the largest reptile of the Sahara and can reach 1.25 m. in length. There are a dozen snake species with several grassnakes, vipers, the horned viper (*Cerastes cerastes*) sidewinder (*Cerastes vipera*) which often hides itself in sand only showing its head. The puff adder and the cobra are two formidable, venomous species of the Atlantic Sahara that are highly threatened by man.

Birds are represented by at least 250 species, including numerous representatives of the Passariform order, European or North African migratory birds that cross the Sahara and stop to regain strength at permanent or temporary water points (oases, gueletas, dayas, and wells). Certain oases serve equally as wintering sites for at least 20 European species. A good 40 species are sedentary desert birds. The houbara bustard, a sedentary bird frequenting the rocky regs, has been hunted to the point of near extinction. About 40 species of mammals frequent the Saharan zone. The largest order is that of rodents, mostly of small size. The most characteristic carnivores are the fox (*Vulpes rueppelli*), fennec (*Fennecus zerda*), zorille (*Poecilictis libyca)*, ratel (*Mellivora capensis*) and the local sand cat (*Felis margarita*). The leopard (*Acinonyx jubatus)* is endangered and exists in very small numbers in Bas-Draa.

Insectivores include the desert hedge hog (*Parechinus aethiopicus)* cohabiting in certain zones with the Algerian hedge hog (*Erinaceus lagirus*), several species of shrew mice (*Crocidura spp.*), and several chiropters (bats).

[2] Centre d'Echange d'Information sur la Biodiversité du Maroc. (www.ma.chm-cdb.net)

Finally, the Ungulates are represented by several species of Artiodactyls which have been heavily hunted during the last decades. Some of these are now extinct: oryx (*Oryx dammah*), addax (*Addax nasomaculatus*), budale (*Buselaphys buselaphus*). Endangered ungulates include dama gazelle (*Gazella dama*), Barbary sheep, cuvier gazelle and doracas gazelle.

Steppes and spiny xerophyte ecosystems

These ecosystems are mainly composed of:

1. **Vast alfa steppes, dominated by** or alfa or sparto grass *(Stipa tenacissima)*, cover more than 2 million ha, particularly in the northeastern portion of the country. They have a rich fauna: 25 species with not less than 7 species of a single reptile family, *Lacertides*. Such a large number of species co-habiting the same area probably constitutes a record for this family for all of North Africa if not the world. Three very rare reptile species are found: the white psamodrome (*Psammodromus blanci*), the occidental ophisops *(Ophisops occidentalis)* and African sand boa *(Eryx jicul)*. This arid steppe is the domain of several species with Saharan affinities: common stereodactyle *(Stenodactylus stenodactylus*)), chisel tooth lizard (*Trapelus mutabilis*) whiptail lizard (*Uromastyx acanthinurus*) sand lizard *(Acanthodactylus boskianus*) as well as several species of the high plateaus of the Algerian and Moroccan border area: mauretanica saurodactyle (*Saurodactylus mauritanicus*), and Algerian psammodrome (*Psammodromus algirus*).

   37 bird species are known throughout the area, of which 11 endemics are rare or endangered. Among the most interesting: bustard (*Chlamydotis undulata*), the owl (*Bubo bubo ascalaphus*), the 'Courvite Isabelle' (*Cursorius cursor*), the Sirli of the desert (*Alaemonn alaudipes)*, the plover (*Eudromias morinellus*) wintering from Europe and the 'Sirli du Dupont' (*Chersophilus duponti)* a North African and Iberian endemic.

   13 species of mammals are confirmed for this area and 4 others are probable. The striped hyena (*Hyaena hyaena barbara*), the caracal lynx and the doacos gazelle (*Gazella dorcas*) are endangered or extinct.

2. **Artemisia steppes** also occupy vast areas of eastern Morocco, most frequently dominated by *Artemisia inculta (= A. herba alba*). The other steppe formations are found in the mountain chains of the Atlas. The Artemisia steppes are very much degraded because of overgrazing by goats. The fauna of these steppes include an interesting array of bird species including five from the Saharan biome that also nest in the Artemisa steppes. The Dorcas gazelle, striped hyena and the porcupine are three mammal species in danger of extinction.

3. High altitude spiny xerophytes are found from 2,000 m. to 3,500 m. or more. Here are found the greatest number of Atlas mountain endemics (*Arenaria pungens, Bupleurum spinosum, Cytisus balansae, Alyssum spinosum, Erynacea anthyllis and Ononis atlantica*). Reptiles include 3 endemic species: the atlas or Andreaskyi lizard (*Lacerta andreanszykyi*), middle Atlas skink (*Chalcides montanus*) and Atlas viper (*Vipera monticola*).

2.4 MARINE AND AQUATIC ECOSYSTEMS

Marine Ecosystems

The national survey on biodiversity showed that the Moroccan marine and coastal waters have a higher level of biodiversity than the entire Mediterranean Sea and the Black Sea put together. Practically all zoological groups and the majority of marine ecosystem types in the world are represented in Moroccan territorial

waters. The particular chemistry and nutrient content of Moroccan marine waters make them some of the richest on the planet.

Coastal Lagoons and Estuaries

Coastal lagoons and estuaries have high species diversity and are very important as nurseries for many species, including commercial species of the open ocean. The main Moroccan estuaries are Moulouya estuary on the Mediterranean coast and Sebou and Oum-Er-Rbiâs, on the Atlantic coast. The most important of those brackish water systems are the lagoon of Nador (115 km^2) prolonged by the salt marshes of Arekmane, and the lagoon of Restinga-Smir. On the Atlantic coastline, the most important are the lagoon of Moulay Bousselham, the Merja of Sidi Boughaba, the lagoon-complex of Oualidia-Sidi Moussa, the lagoon of Khnifiss and Dakhla Bay. Most estuaries and lagoons are badly degraded.

Freshwater Ecosystems

Most of Morocco's permanent lakes are grouped in the Middle Atlas. Morocco has the most important riverine ecosystems of all of the Maghreb. Springs have especially high levels of endemism because of their long isolation and the exceptionally low temperature of the water of most springs. Underground caves also frequently have high levels of endemism because of their isolation.

The fario Trout is highly prized for sport fishing and consequently enjoys a relatively high conservation priority. It has disappeared from certain rivers but other populations enjoy a level of natural protection because of the remote streams of difficult access where they are found.

Shad is even more endangered. With a life cycle similar to that of salmon, they are very susceptible to overfishing using marine fishing nets. Returning to the freshwater streams of their birth, they are confronted with pollution and with dams that have no fish ladders. The great shad in particular has become extremely rare, although it was still captured in large quantities just ten years ago. The Ministry of Agriculture has recently banned the fishing of this species in hopes of attempting the recovery of this highly valued species.

The eel continues to survive in those water courses, lagoons, coastal merjas and drainage canals where pollution levels are not too high. Eel aquaculture is practiced in certain coastal waters, but wild populations are increasingly threatened.

Fish Reserves [3]

The fishing reserves are intended to enrich the continental water (lakes, lagoons, rivers..) with some fish species for fishing activities. In this context, the Forest Service acts in two levels:

- Creation and management of permanent reserves located in different regions of the country. In these reserves fishing activities are totally prohibited.
- Identification of annual reserves where the fishing is regulated (rivers, lagoons, etc.) The fishing is allowed only during the specified open seasons. These reserves are reviewed annually and updated based on information of fish populations.

[3] Source : Forest Service

Permanent Fishing Reserves		
Region	**Number**	**Remarks**
Meknès-Tafilalet	15	
Gharb-Chrarda-Beni Hssen	2	Merja de Sidi Boughaba
Chaouia-Ourdigha	1	
Marrakech-Tensift-El Haouz	1	PN Toubkal
Tadla-Azilal	1	
Tanger-Tétouan	2	
Casablanca	1	
Total	23	

Exhibit 4 - Permanent Fishing Reserves

2.5 SPECIES DIVERSITY

The Moroccan fauna is very rich; more than 24,600 species have been identified and the total number is believed to be significantly higher. Marine fauna is represented by about 7140 species and is strongly dominated by the arthropods (1930 species), the mollusks (about 1600) and the vertebrates (1150). The endemism (close to 240 species) is found mainly amongst the mollusks (84 species). Freshwater and wetlands fauna is comprised of almost 1600 species with a rate of endemism of about 8.65%. The terrestrial fauna is very developed with close to 15,300 species essentially dominated by arthropods (14,495 species). Endemism is very important (about 2280 taxa).

One of the highest levels of species diversity of plant groups in Morocco is found amongst the multicellular algae known as sea weeds. More than 610 species have been inventoried, dominated by the *Rhodophycae* (red sea weed) with 379 different species. The freshwater wetlands flora has been poorly studied. The terrestrial flora is relatively well documented with close to 6500 different species distributed amongst the phanerogams or vascular plants (about 4500 species); then mushrooms (820 species), lichens (700 species), mosses (350 species) and ferns (60 species).

2.6 AGROBIODIVERSITY

Morocco has about 8.7 million hectares of lands suitable for agriculture found under highly variable agro-ecological conditions within which Moroccan farmers have long been making adaptive selections. This has resulted in an exceptionally rich diversity of locally adapted varieties and breeds of crops and domestic livestock – a genetic heritage of world-wide importance. Morocco is considered an important genetic diversity center for several genera of cultivated species and their wild relatives. The main genera of wild relatives of crop plants include *Avena, Medicago, Lupinus, Trifolium, Aegilops, Phalaris, Hordeum, Triticum, Lathyrus, Ononis, Vicia, Astragalus, Bituminaria, Lotus, Stipa, Eragrostis, and Beta.* However, several species described in the past have now become rare or even extinct (example: some species of the *Medicago*, *Lupinus, and Cicer. genera.*); others are found only rarely in the mountainous zones on steep slopes of difficult access. Among the fruit trees cultivated in Morocco, one finds the highest level of genetic/varietal diversity amongst the following genera: *Olea (olive), Pistacia (pistachio), Ficus (fig), Prunus (plums and related fruit trues)* and *Amygdalus (almond).*

For domestic livestock, Morocco has developed an important genetic heritage adapted to particular environmental conditions. Morocco has more than 8 ovine breeds, including the famous *D Man* breed, exceptionally well-adapted to the particular conditions in the oases in the south of Morocco and one of the most prolific ovine races in the world. Other breeds of special importance include two bovine breeds ("the

blond of Oulmes" and the "brunette of the Atlas"), goat breeds *Yahiaouia* and *Attaouias* and some camel breeds with *Aît Khebbach, Rguibis, Rahalis, Mamyas* and *Guerzini*s.

2.7 PROTECTED AREAS

All ten protected areas in Morocco are managed by the Forestry Service (Haut Commissariat aux Eaux Forêts et à la Lutte contre la Désertification or HCEFLCD). There are ten national/natural parks including three that have marine areas within their boundaries (Marine areas are poorly represented in the protected areas network.) Morocco has a small number of old, long established national parks and an active program for the creation of new protected areas. Four national parks were created between 1942 and 1991, namely Toubkal NP (1942), Tazekka NP (1950 extended in 2004) in Taza province, Souss Massa NP (1991) in Chtouka, Ait Baha and Tiznit provinces and Iriqui NP (1994) - Tata and Ouarzazate provinces. Management plans have been prepared for these national/natural parks. (There is little functional difference between the national parks and natural parks)

As part of the preparation of the 1996 Protected Areas Master Plan, an additional 160 Sites of Biological and Ecological Interest (SIBE) were identified on the basis of a country-wide ecosystems assessment. The criteria to identify the SIBE included a criterion for representativeness of the natural ecosystems of the country. This network of SIBEs have been prioritized into 3 groups: Priority 1 – 48 SIBEs; Priority 2 – 50 SIBEs; and priority 3 – 62 SIBEs. The Master Plan calls for the SIBEs to be progressively converted into legally gazetted protected areas. A dozen of them are targeted to become national parks. The locations of all of the SIBEs are presented in ***Annex G*** along with five pages on detailed information on these SIBEs in the same annex.

Under the Master Plan, the national network of protected areas is being expanded. Four new national parks were created in 2004, namely: AI Hoceima (AI Hoceima Province), Talassemtane (Chefchaouen Province), Ifrane (Ifrane Province), High Atlas Oriental (Errachidia and Khénifra provinces). The Khnifiss National Park (185,000 ha), created in 2006 in the Laâyoun Province, is the first Saharan national park in Morocco. The national park of Khénifra was established in 2008.

Morocco also has three Biosphere Reserves. They are:

- The Argon Forest Biosphere Reserve (RBA) with an area of 2.5 million hectares in the South-West, was created in 1998;
- The Southern Morocco Oases Biosphere Reserve (RBOSM) was created in 2000 and covers 7,200,000 has.
- The Mediterranean Intercontinental Biosphere Reserve (RBIM) covers nearly 1,000,000 ha and is divided roughly equally between Morocco and Spain. The Moroccan portion is located around the Tingitana Peninsula (Provinces of Chefchaouen, Tétouan, Fnideq, FahsAnjra and Larache).

All, or nearly all, of the protected areas in Morocco have people living in them – Al AI Hoceima NP has 12,000 people living inside its boundaries. These people have farms, cultivate fields and raise sheep, goats and cattle. They get their firewood from the surrounding forest. The differences between protected areas and areas outside of protected areas in terms of effectiveness of biodiversity conservation are not that clear.

2.8 INSTITUTIONAL RESPONSIBILITIES

The main institutions involved in biodiversity conservation are:

- Department of Environment of the Ministry of Land Use Planning, Environment, Urbanism and Habitat. Its main mandate with regards to biodiversity conservation is to elaborate and implement the government policies on environmental management. It also coordinates actions of the different government bodies dealing with environment in general and

biodiversity conservation in particular. The department is the focal point of the Convention on Biodiversity and Convention on the Climatic Changes.

- Forest Service (HCEFLCD) has the main mandate of conserving and managing state-owned forest and range lands. This mandate includes watershed management and responsibilities for the management of Morocco's protected areas network. The Forest Service is the focal point of Convention on the Desertification Control and others such as Ramsar, Cites, etc.
- Ministry of Fisheries has responsibilities for managing marine fisheries.
- National Fisheries Office is a parastatal institution providing support to marine fisheries.
- National Institute of Marines Fisheries Resources is responsible for research on marine fisheries. This institute has traditionally focused primarily on research directly related to commercial fisheries and less on marine ecology.
- Ministry of Agriculture has responsibilities for food security, agricultural systems and water conservation.
- Ministry of the Tourism acting mainly in the use of the landscapes and ecosystems for tourist activities.

Other official government actors with responsibilities related to biodiversity conservation are the following:

- High Council of Water and Climate;
- National Council on Forests:
- National Council for the Environment
- National Committee of Biodiversity;
- Consultative Committee of the National Parks;
- Commission of Distraction of the Forest Régime.

There are more than 400 national NGOs involved in the field of biodiversity conservation. Among them are found:

- Mohamed VI Foundation for Environmental Protection;
- RARBA: Network of the Associations of the Reserve of the Argon Biosphere. It is composed of several associations grouped in a network acting for sustainable development of Chtouka and Ait Baha provinces (http://www.humanvillage.com/Reseau-des-Associations-de-la,10056.html).

A number of private foundations operate in the environment sector. Their main activities are concentrated in human resource development through micro-credit loans for activities regenerating revenues, awareness, they include:

- Argon Foundation
- Foundation Zagoura Micro - Credits
- The Foundation BMCE – Bank for Micro Credit.

3 THREATS ANALYSIS

3.1 THREATS TO TERRESTRIAL ECOSYSTEMS

The most important threats to terrestrial ecosystems are presented in approximate descending order of their importance:

- Overgrazing
- Over-harvesting of non-timber products
- Climate Change
- Other direct threats/pressures

Overgrazing

Nearly all state-owned forest and rangelands are very badly overgrazed as are much of the communally owned rangelands. The Moroccan forest law used to restrict grazing rights to local users with small family owned herds but this system has broken down under conditions of rural poverty, rapid demographic growth and conversion of the best pastures to agriculture. A system of "association" (local herders in partnership with outside persons/investors) has developed resulting in livestock pressures that are far in excess of the carrying capacity. For example, in much of the Middle Atlas, overgrazing eliminates nearly all forest regeneration leading to soil erosion and degradation of watersheds. Use of state-owned forests and rangelands is primarily characterized by open access to the resources. The resource is used a free good – no one pays for using it and no one invests in its management.

Overgrazing is a major cause of watershed degradation. Overgrazing reduces vegetative ground cover resulting in decreased infiltration and evapotranspiration, increased volume and velocity of runoff , increased flooding, increased soil loss and increased sedimentation in man-made reservoirs, streams, lakes and marine ecosystems. See ***Annex K*** for a more complete discussion of the linkages between biodiversity and forest and range conservation and watershed management/the water sector.

Over-harvesting of non-timber products

The Forest Service does quite a good job of regulating the harvest of major commercial wood products, but firewood and many non-timber products are very seriously and illegally over-exploited. For example, virtually all cork oak acorns and argon fruit are harvested on most sites, leaving almost nothing for regeneration. Other products that are over-exploited are mushrooms, truffles and carob pods. Root causes include open access, poverty, lack of economic alternatives and the impossibility of policing such activities over enormous areas with rural populations living interspersed within the forest and range lands themselves. Nearly all forest areas in Morocco have people living in them.

Many of the mountainous forested area have very high levels of poverty. Agriculture on the mountain slopes is generally a marginal activity. The pressure on natural resources in general and forest resources in particular is very high. As *de facto* open access areas, forests are a major source of revenues for local community resource users and their "associates". This situation is aggravated by the absence of regulations that might enable participatory approaches to forest management.

Fragmentation: The forest areas of Morocco are much more fragmented than they once were. The main cause has been conversion of forests to agricultural uses over the past centuries. Conversion of natural forest

to plantations of exotic species also fragments the natural forest ecosystem – this is especially important in the Mamora cork oak forest. It is well established that small fragmented ecosystems can support a smaller number of species than larger fragments. Forests fragments will continue to lose species for a long period of time, even in the absence of other pressures.

Climate Change

Moroccan terrestrial biodiversity is seriously affected by climate change. Temperatures are increasing and rainfall is decreasing putting ecosystems and species under severe stress. These changes have sometimes resulted in the outright mortality of the dominant species of some forest ecosystems (Atlas cedar). Climate change modifies the basic environmental conditions that ecosystems and species are adapted to.

Other direct threats/pressures

- Conversion to agriculture: In the regions where the forest domain is not yet delimited (e.g., Azilal and northern regions), clearing of forest land for agriculture continues to be a problem.

- Wildfires: Although of less impact than the above pressures, wildfire ravages an average area of 3,600 ha per year. The majority of these wildfires are located in the northern regions of the country. Most forest types are very negatively impacted and do not regenerate well after fire. Wildfires are likely to become more frequent and more severe as climate change progresses.

- Urbanization: As in most areas of the world rapid urbanization combined with poor planning, and high returns on investment in the construction of apartment buildings and the construction industry in general has led to extremely high rates of expansion of the "built environment". Forests are converted to urban areas in the same way the agricultural and pasture lands are converted. Indeed, the forest domain is a major target for the investors. This situation is encouraged by lack of vision and effectiveness of national and regional land use planning as well as weaknesses in the forest law (temporary occupation – for 99 years!).

- Invasive species: *Acacia molissima* has been widely planted in the Mamora forest for the production of tannin. It has become an invasive species although its spread does not appear to be to be too rapid. Its control is already increasing forest management costs – it must be manually weeded out of forest plantations and natural forests.

3.2 THREATS TO MARINE AND FRESHWATER ECOSYSTEMS

Overfishing/Overharvesting

Overfishing or overharvesting of marine and coastal biodiversity is the greatest and most generalized threat. Coastal fisheries have historically been open access resources although this has started to change in recent years (e.g., the government has imposed, and is enforcing, a freeze on the number of fishing boats). Tidal zone shoreline sea life that can be collected on foot is especially vulnerable, but all coastal and open sea fisheries are badly over-harvested. The foreign industrial fishing fleet uses ever more sophisticated technology for efficiently "scouring" the seas. The biology and ecology

A visit to the port at Al Hoceima is highly instructive. Drift nets that were recently made illegal within the European Union are on open display on the docks. Indeed, many owners of the Moroccan fishing fleet invested heavily in equipment that became available at bargain prices when it was made illegal on the other side of the Mediterranean. Much of the fleet in this harbor is specialized in the use of long lines, another highly criticized fishing technology. The largest fishing boats are trawlers that routinely rake the ocean bottom clean and that efficiently capture fish of all types.

of marine and freshwater ecosystems are poorly studied and poorly understood. The state completely lacks the means to effectively enforce regulations on the activities of coastal fishermen. Demographic growth and poverty are major root causes driving the overexploitation of coastal marine resources. The state has not been effective in preventing the over-harvesting of the industrial open sea fisheries. The historical movement of the fishing fleet farther and farther to the south as fish stocks are depleted in the north is evidence of this.

Drainage, development, and urbanization

Drainage, development, and urbanization are major threats to wetlands and coastal ecosystems. Coastal areas in particular have been hugely impacted by the construction of secondary residences, urban growth and the expansion of industries, infrastructure, and tourism complexes. Wetlands are drained and/or filled for agriculture, urban and industrial expansion, road construction and other land uses. Sand and gravel are extracted for construction materials. Root causes include rapid demographic growth, rapid economic development/urban growth/industrialization, rapidly increasing demand for water and lack of understanding of the ecological importance of wetlands.

Fragmentation

Fragmentation of habitats by dam construction is a major threat to river and wetland ecosystems. Dams cut aquatic ecosystems into smaller pieces, greatly perturbing the biological cycles of fauna and leading to species loss and diminished ecosystem integrity.

Pollution

Pollution threatens many aquatic ecosystems and coastal marine ecosystems. Almost all estuaries, lagoon, and lower river courses are heavily polluted. Pollution comes from agricultural non-point sources and from urbanization and industrialization. The only known case of community management of coastal marine resources came to an early and premature end because pollution levels in Oualidia Lagoon built up to levels where clam marketing from the lagoon had to be shut down. – See *Error! Reference source not found.*.

Invasive exotic species

Invasive exotic species pose some level of threat. An introduced oyster species used in aquaculture in a lagoon at Nador has escaped and has largely replaced the native species. This also is a threat at Dakhla and Khnifiss. Introduced varieties of sea life used in aquaculture escape and interbreed with wild populations, altering there genetic makeup.

Climate change

Climate change is an additional threat and results in reduced water inputs into freshwater ecosystems. Climate change combined with rapidly growing human demands for water may prove devastating for remaining downstream wetlands.

Poaching

Poaching adds to problems of unsustainable use. It affects a wide variety of species – poachers target everything from bird eggs to flamingoes.

4 CONSTRAINTS TO CONSERVATION

4.1 CONSTRAINTS TO THE CONSERVATION OF TERRESTRIAL ECOSYSTEMS

Land tenure and resource access rights

The laws governing the commercial harvest and marketing of biodiversity products from state lands have almost systematically excluded local communities and resource users from these benefits. Commercial products are almost always harvested by relatively wealthy elite who generally come from urban centers. Those who live in or near the forest are systematically excluded from the direct financial benefits from the harvest and marketing of commercial forest products. They instead hold usufruct rights. Usufruct rights, by definition, are non-commercial rights. This land tenure system leaves very little incentive for local people to conserve the forest. To the contrary, given the impossibility of effectively policing the enormous areas of state-owned lands, the incentive for illegal use is very high, and the chances of getting caught relatively low.

> At a recent workshop held in the Middle Atlas, a local citizen admitted that he had recently been caught, found guilty and fined for the illegal cutting of forest products. The fine has to be paid in cash. He told the workshop participants that the only way he could raise the cash was to cut go back and illegally cut and sell more forest products!

All forest lands are used as grazing lands. Nearly all forest lands, and much of the steppes, are state-owned. All of the livestock that use these lands are privately owned. Grazing was recognized as a usufruct right (*droit d'usage*) in the 1917 Forest Law (Dahir). That portion of the 1917 Dahir that deals with grazing rights is based on traditional rights. It grants grazing rights for small family-owned herds. These rights were defined by ethnic group ("fraction") and by registered individuals. These registers are no longer maintained, the system has broken down and most of the livestock are now owned by absentee owners in "association" with those who hold traditional rights. Access to most grazing lands is *de facto* open access, negating any possibility of management.

Another critical aspect of the 1976 Dahir is that it gives 100% of forest revenues from authorized forest product sales (including some NTFPs like cork) to local government – to the communes. This greatly complicates current participatory initiatives that allow forest cooperatives to cut and sell forest products. There are conflicting opinions on the legality of these current, very positive, initiatives.

Lack of proven models for range management and for co-management

Although overgrazing is a generalized threat to forest ecosystems, range management has not been successfully integrated into forest management. There are no clear cut success stories for range management anywhere in Morocco. The Forestry Service could not possibly manage the range without directly involving local communities/herders. Indeed, there is a great opportunity and need to involve communities in the management of all forest and range types. There have been a few pilot activities to begin to involve and to integrate local communities in forest management (case of Bouhessoussen and Sahel Doukkala perimeters and the very recent co management initiatives in Kénitra). Results have been very positive but these initiatives have barely scratched the surface of the needs and opportunities. A UNDP/GEF Transhumance project is seeking to reinstate traditional range management systems near Ourzazate.

In the past three years, the Forestry Service has begun experimenting with participatory approaches that involve local forestry cooperatives as service providers and in a limited role as timber cutters and as sellers of wood products harvested. See Chapter Six for more details on these recent initiatives.

Sectoral approach

Until relatively recently, most of the Forest Service's forest management activities were concentrated primarily on commercial forest production. National strategies, plans and policies remain primarily sectoral, especially during their implementation phase. Although overgrazing is the greatest threat to the forest, The Forest Service has not integrated range management into forest management. .Perhaps more surprisingly, watershed management has not been integrated into forest management except at the level of reforestation (see text box). The weak synergy and integration of resources is a real constraint to the conservation of terrestrial ecosystems

Morocco has a rich history of watershed management initiatives going back over decades. However, the Assessment Team learned that all such initiatives have targeted a) cultivated fields, and/or b) reforestation. It appears that no watershed management project has ever had the objective of improving the management of range and/or forest lands.

Legal and policy framework

The present legal and policy frameworks present many constraints to the conservation of terrestrial ecosystems. Many laws are very old. Some lack the regulations needed to apply them. The majority of them are oriented to commercial products without insuring the sustainability of the ecosystem. The basic forest legislation for Morocco was laid out in the 1917 Dahir. It's main objectives were principally oriented towards the protection and conservation of the state forests. The Forest Service was set up along paramilitary lines with a strong hierarchical structure and a major emphasis on protection and enforcement. The forester very early on became a policeman. The relationship between local people and the Forestry service has been an antagonistic and conflicting relationship form the beginning.

The Dahir of 1976 lays the legal basis for participatory involvement of local populations in forest/natural resources management. However, the related regulatory texts (*textes d'application*) that are needed to make this law operational have never been prepared/ enacted. The 1917 and 1976 Dahirs have created conflicting situations for forest service agents, who are paramilitary officials. In the absence of regulations that would allow the application of the 1976 Dahir, the urban and rural elite have continued to realize nearly all of the financial benefits from commercial uses of the forest.

In Morocco, as in the rest of the world, there is a basic question of equity and governance involving the sharing of the costs and benefits of watershed management. Usually, the inhabitants of the upper watershed pay the costs of watershed management and the downstream irrigated farmers and urban water users enjoy the benefits. Those that live in the upper watershed are asked to bear the costs of terracing and other soil and water conservation measures or the cost of reducing the number of their livestock in order to ensure good vegetative cover of the watershed, etc. A more equitable policy framework for watersheds would have the downstream water users contributing to the watershed management costs born by the resource users in the upper watershed.

Insufficient institutional capacities

Institutional capacity constraints have been identified at three main levels:

- **The Forestry Service** has quite well developed capacities in forest management for timber production, but generally lacks expertise and experience in participatory approaches to resource management. They also lack range management expertise and protected areas management expertise – especially for the marine portions of protected areas.

- **The young forest cooperatives** and unions (groupements) of forest cooperatives need strengthening in a range of areas, especially the following:
  - Accounting/bookkeeping
  - Business management
  - Good governance
  - Natural resource management

- S**upport Institutions** Capacities need to be developed in both government and non-governmental institutions to support the development and replication of participatory co-management systems and to provide capacity building support to forest cooperatives. Commonly, NGOs are best suited for providing such support to local community structures.

Insufficient political will

Insufficient political will is a constraint that makes many people and institutions unwilling to confront these problems. Other ministries /agencies usually leave forest conservation for the foresters. They do not see the forests as a national heritage. Also, there is little willingness to address absentee ownership of livestock.. This situation makes the forest sector subject to many political pressure groups.

No "Red List"

The lack of an official list of endangered species is a constraint to effective conservation. Most countries have established such lists and this serves to focus attention on the need to protect the species on the list.

4.2 CONSTRAINTS TO MARINE AND FRESHWATER ECOSYSTEMS

Lack of fully developed participatory management systems for many ecosystems

Coastal fishermen are rarely involved in the management of the coastal fisheries resource. There has been very little development of participatory management. The experience of the Oualidia's Women's Clam Cooperative is very much the exception rather than the rule (see ***Annex L***) Management of coastal fisheries and that of freshwater reservoirs could potentially be made much more intensive and effective if local communities/fishermen were directly involved and if they could self-police the use of such modern techniques as the use of no-take-zones.

Resource access rights and involvement of local populations

Except for the need for a fishing permit and the freeze on the number of boats, most coastal fisheries and freshwater aquatic ecosystems are quasi open access resources. This is especially true for the tidal zone fisheries. The state tries to regulate use, but lacks the means. Local communities and coastal fishermen are rarely involved in the management of the resources. Fishermen also have high levels of illiteracy and have little incentive to use the resources sustainably in the prevailing context.

Poor governance

Poor governance is a major constraint to the coastal fisheries sector. Artisanal fishermen are poorly organized and poorly informed. The representation of fishermen on boards, stakeholder fora tends to be inequitable. Law enforcement tends to favor the wealthiest investors who are the most heavily invested in modern efficient technologies over the small artisanal fisherman. The artisanal fishermen reported to the Team that trawlers frequently come to depths as shallow as 10 meters, efficiently capturing the fish in the area legally

reserved for the artisanal fishermen. These shallow waters are also the most important areas for the reproduction of many commercial species.

Insufficient means for enforcement

The state attempts to manage most marine and fisheries resources through regulations and enforcement. Effective enforcement of local fishermen and impoverished resource users is not practical. The state has insufficient resources (radar, patrol boats) and personnel) for enforcement of regulations. Perhaps the biggest problem of enforcement is in the tidal zone, where any impoverished local resident can collect high value species on foot.

Inadequate legal and regulatory frameworks

The legal and policy framework has not been developed for participatory/co-management of coastal fisheries. Most critically, there is no legislation allowing the granting of exclusive access rights over coastal fishing waters to organized groups of local artisanal fishermen.. Some threatened/vulnerable elements of biodiversity are not protected by law. Examples include the monk seal, osprey and bird eggs. There is problem of unsuitability or the absence of legislation concerning destructive marine resource harvest practices (collection of seaweed).

Insufficient capacity, expertise and knowledge

There is a major shortage of scientific expertise for marine ecosystems, ecology, biology, restoration**.** The material and financial means for research on sustainable use, management and conservation are inadequate. There is no one national institution with the capacities needed to define and implement national priorities and programs on marine biodiversity. There is no oceanographic institute. There is inadequate scientific information for most marine biodiversity/ecosystems.

5 IDENTIFICATION OF ACTIONS NEEDED

5.1 ACTIONS NEEDED TO CONSERVE TERRESTRIAL ECOSYSTEMS:

Concrete steps that need to be taken to overcome the above mentioned constraints are identified in this chapter, beginning with terrestrial ecosystems:

1. Support the development of biodiversity product value chains

    - Wherever the sustainable management and regeneration of the resource can be ensured – and only then!
    - Will often require the development of new sets of management tools and approaches.
    - Seek to maximize the benefits to local communities/ businesses and user groups in ways that create incentives for sustainable use.
    - Reinvest part of the revenues back to cover NR management costs

2. Development of policies/laws/regulations that:

    - Favor local communities and local businesses as the principal beneficiaries of commercial biodiversity products
    - Lay a sound basis for co-management of biodiversity resources on state-owned lands
    - Enhance land/resource security for those who practice sustainable use/protection
    - Revise 1976 Dahir to develop an equitable sharing of revenues and costs between communes and community managers. A new Forest Code was prepared in 1997 and is still has not been approved.

3. Development of participatory co-management systems for forest and range lands

    - Local communities/herders should be the principal beneficiaries of participatory management systems
    - On forest lands, commercial harvest rights for forest products should be conditional on sustainable range use systems that allows for natural forest regeneration
    - Grazing rights should be limited to local resident herders

4. Improved knowledge management for forest/range conservation/sustainable use

    - Review and dissemination of best practices and lessons learned
    - Develop use of participatory adaptive management reviews to integrate best practices
    - Establish NR fora for stakeholder inputs on key issues
    - Improved donor coordination

5. Institutional capacity development:

- Development of forest service capacities for participatory approaches to forest and range management
- Development of the range of capacities needed by community co-managers
- Development of capacities for replication/adaptation of successful co-management models.

6. Support for the development civil society oversight community of management systems or lease systems

7. Certification of forests and forest products (cork, rosemary etc) to increase financial returns to community managers and others in the market chain

5.2 ACTIONS NEED TO CONSERVE MARINE AND AQUATIC BIODIVERSITY

Actions to improve the conservation and sustainable use of marine biodiversity are presented below.

1. Test, adapt, and replicate pilot systems of participatory co-management of coastal marine resources.

    - Specific techniques to be tested:

        a) Granting of geographically defined exclusive fishing rights for each fishing village/community management structure;
        b) Develop participatory management systems for tidal zone/shallow water
        c) Coastal fisheries co-management
        d) Make the exclusive rights contingent upon respect for contractually defined obligations
        e) Use of no-take-zones as a management technique for sedentary/low mobility species
        f) Self-policing by local fishermen's cooperatives

2. Develop coastal and tidal zone fisheries value chains

    - Do this only where the sustainable management of the resource can be ensured
    - Seek to maximize returns to local fishermen

3. Legal and policy reform:

    - Develop a clear policy and legal framework for participatory management approaches.
    - Develop legal basis for granting of exclusive rights over coastal resources

4. Create a full network of marine protected areas that cover the full range of marine and coastal ecosystems

5. Develop institutional and human resource capacities in the marine sciences that are needed for the conservation and sustainable use of marine biodiversity.

5.3 GENERAL ACTIONS NEEDED FOR ALL ECOSYSTEMS

General actions needed to improve the conservation of all types of ecosystems are the following:

1. Develop a Red List of all the threatened habitats and species of Morocco, the first stage for a real and efficient conservation of the national biological heritage

2. Develop legislation governing the use of many threatened species of animals and plants

3. Analyze, and act on, the need for a national specific structure, like an "Institute of Biodiversity" for the survey and the conservation of Morocco's biological heritage

4. Develop a national biodiversity monitoring network

5. Elaborate programs of awareness raising and education for the sustainable use and conservation of the biologic resources exploited

6 EFFECTIVENESS OF ONGOING CONSERVATION INITIATIVES

6.1 INITIATIVES RELATED TO TERRESTRIAL ECOSYSTEMS

This chapter analyzes the effectiveness of ongoing conservation initiatives in relation to the needed actions that were identified in the preceding chapter.

Forestry Service in-house initiatives on participatory approaches

The Forestry Service made some attempts in the past decades to support the development of forest cooperatives starting in Khenifra, but these initiatives yielded little terms of positive results. Starting in 2006, however, the Forest Service has launched a much more ambitious and innovative program of participatory approaches to forest management involving forest cooperatives and unions (*groupement*) of forest cooperatives. National workshops on participatory approaches were held in Kehnifra in 2006 and in Kenitra in 2008. The Forest Service has undertaken internal training programs with the objective of changing the attitudes and behaviors of the foresters themselves.

The regional Forest of Kénitra was chosen as pilot for forest co-management activities. All former forest cooperatives of the region were grouped in nine unions or economic interest groups "GIEs (Groupement d'intérêt Economique)". Ten contracts have been granted during 2007 for a total area of 27,000 ha and generated a total of 55,000 men/day work. The illegal use (*délits forestiers*) dropped by about 98% in first year – a truly remarkable achievement. This shows how quickly attitudes of local people can change when they are offered a financial stake in the management and commercial use of the forest. The experience provides major employment generation for the most impoverished. It is an excellent basis for replication and expanding initiatives to other forest regions. Although this had not been done yet, the experience gives also great opportunities for improving value chains of biodiversity products that are presently harvested as open access goods – acorns, mushrooms, truffles, etc. The Forest Service has indicated a willingness to grant exclusive harvest rights to these products to the local forest cooperatives/ unions as part of their new, evolving partnership arrangements.

> The Assessment Team visited one of these unions at Sidi Yahia du Rharb. The union is working under its second contract with the Forest Service. Under the contracts they are granted the harvest rights to timber sales that no one else had bid on. The union pays for the timber sale partly as a (service provider – providing man-days of labor) and partly through cash payments. The union we visited conducts surveillance patrols and several sylvicultural interventions (tree planting, pruning branches in pine plantations, precommercial thinnings, etc) The initial results are very positive and encouraging. There is an easily visible recovery of cork oak trees that used to be subject to severe overcutting of their branches for livestock fodder.

Potential shortcomings of the Forest Service's initiatives may be the following:

- Experience not developed under a long-term co-management vision but only under short term contracts;
- The way the contracts have been negotiated to date leaves little possibility for the coops to develop their own investment funds

- The Forest Service's contracts with the cooperatives are of questionable legality since the 1976 Dahir requires that 100% of revenues go to communes. Professional timber merchants *(exploitants forestiers)* may also challenge the legality of the initiative if the program is expanded.

USAID-supported rosemary cooperative near Oujda

Another example of a Forest Service partnership arrangement with a local cooperative is found near Oujda. In this case, the cooperative has been receiving assistance in developing the rosemary value chain from the USAID-funded Integrated Agriculture and Agro-Business Project near Oujda. The forest cooperative received a long-term contract from Forest Service for 22,000 ha of rosemary. The cooperative produces and markets essential oils from the rosemary. There is a huge such potential for developing value chains based on aromatic plants (for essential oils) and medicinal plants. This initiative showed also very positive results and the cooperatives respect for their contractual obligations has been very good – see Chapter 7 for greater details.

UNDP/GEF Transhumance & Range Management Project

This is the only initiative identified that is working on the development of range management systems for the extensive steppe ecosystems of Morocco. The project started in 2001 near Ouarzazate with the main objective of biodiversity conservation through the restoration of traditional range management systems that had broken down. The project site is a zone of major transhumance and the transhumant herders have been organized and structured around their traditional tribal land rights. Provision of basic social needs (education, health, etc.) is also addressed by the project. According to UNDP, the first monitoring results on range/biodiversity impacts will be available in 2009. The initiative is a very promising initiative, but still "fragile". Efforts are now focused on integrating the achievements into the existing institutional frameworks of the local communes and government administrative services. It is considered as a success story.

UNDP/GEF Middle Atlas Integrated Forest Ecosystem Management Project

This project is just starting after considerable delays. The project seeks to reverse the major threat to the forest ecosystems, that of sever over-grazing, through the development of range and forest co-management systems in two pilot communes of the Middle Atlas. The pilot communities will be structured and empowered to harvest/market forest products based on management plans. In return, they must adopt range management practices that ensure the natural regeneration of the forest – regeneration that is largely absent at present. The co-management system is to become self-financing -- the community managers will be required to reinvest part of their revenues to cover natural resource management costs. The project could benefit from assistance on value chains and gives major opportunities for intensifying forest management.

One of the opportunities for intensifying forest management while improving while increasing revenues and employment concerns the very extensive Holm oak stands of the Middle Atlas. Over the past several decades, the Forest Service has clear cut nearly all of the old growth Holm oak forests. Most of them have grown back into dense coppice stands – stands that grow so dense that there is very low biodiversity with almost no herbaceous ground cover underneath the dense canopy and almost no forage for livestock either. The Forest Service does not thin these stands because the high cost of preparing and managing the timber sales is not justified by the returns from the relatively low value wood products produced. Under co-management, the much lower operating costs of the forest cooperatives would easily make the thinning over these coppice stands into profit-making ventures with the side benefits of increased herbaceous forage, increased produced of acorns (highly prized by livestock), controlled harvest of Holm oak branches for winter forage and enhanced watershed function.

6.2 INITIATIVES RELATED TO MARINE AND AQUATIC ECOSYSTEMS

Oualidia Women's Clam Cooperative

The Assessment Team was only able to identify one single initiative whereby local fishermen were directly involved in coastal fisheries management. This is the experience of the Oualidia Women's Clam Cooperative in the Oualidia Lagoon south of El Jadida. The cooperative received exclusive rights to two hectares of the lagoon suitable for the production of clams. The two hectares was leased from the government. Management was very simple but very productive -- it consisted of enrichment and protection. The area was enriched with tiny clams either collected locally or purchased. A guard was hired to prevent unauthorized entry into the two hectares. The adult clams were harvested in December when export prices reach their highest levels.

The strong points of this experience essentially correspond to the fact that:

- The women's cooperative was composed of a traditional users group. The women that made up the cooperative were the same women who traditionally harvested the resources of the lagoon.
- The cooperative gave the women the legal status needed for leasing and for dealing with the Fisheries Department and financial and technical backers.
- The cooperative was empowered with exclusive rights over their two hectares. This is perhaps the most critical element of the entire initiative because it put an end to the prevailing, and highly destructive, open access to the marine resources of the lagoon. Under open access, no management is possible.
- Financial incentive - the clam is an exported product that sells at a very attractive price. The members of the cooperative found financial profits in the management of their two hectares of lagoon. They had a strong financial incentive to respect their contractual obligations and to protect their resource.
- The initiative was highly promising in terms of ecological sustainability. The women have shown that they could ensure the regeneration of the resource and that they could discipline themselves to only harvest the mature clams, leaving the young to develop for future off-take.
- The two hectares of clams may have played a key role in enhancing the regeneration of clams throughout the lagoon. Unfortunately, the initiative ended prematurely because of pollution build up in the lagoon – a factor beyond the control of the women's cooperative.
- The initiative involved an impoverished population with very few resources. They demonstrated their ability to honor their obligations and to defer harvest until the optimal period.
- With the exception of the water pollution problem, the cooperative was able to ensure the ecological conditions necessary for this vulnerable resource and to thrive in a sensitive environment.

Management plan for octopus

The Ministry of Fisheries has recently completed their first management plan for marine resources. It is a species-based plan for octopus. Under the plan, the sustainable offtake or quota is calculated each year by the Ministry and the octopus fishery is to be shut down when that quota has been reached. This requires close monitoring of the catch to determine when the quota is reached. This monitoring would be greatly facilitated by the Ministry's program to concentrate all fishermen into 60 fishing villages (PDA).

The PDA program

The government currently has a program underway to ultimately concentrate all coastal fishermen into 60 fishing villages (PDA). Eventually it is planned that eventually all fish will be landed at one of the 60 PDA or

at a recognized port. PDA will improve sanitary standards and will increase government control and tax collection. This will be combined with a centralized data collection initiative that will be used for implementing management plans – such as the octopus management plan described above.

It would appear that concentrating fishermen into 60 fishing villages will also serve to increase the average distanced traveled by fishermen. This is of doubtful benefit in an age of fossil fuel depletion and rapidly increasing fuel prices for boats. Also, it is not clear to what extent the PDA program will be successful in getting artisanal fishermen to relocate to the PDA. Offering incentives to relocate is one thing – forcibly resettling people is another thing all together. What portion of artisanal fishermen will willingly relocate to the PDAs?

Marine protected areas

There are protected areas that are marine parks only, but three national parks (NPs) have marine portions. Two of them have been created in the last four years -- Al Hoceima NP in 2004 and Khnifiss in 2006. All these parks with marine components are under the mandate of the Forest Service.

The Assessment Team met with three fishermen's associations in Al Hoceima and an environmental NGO that works actively with both the park and the fishermen's groups. Two of the fishermen's associations represent fishermen that fish in the waters of the park or on its borders. They claim they were informed about the park after its creations but will not consulted beforehand. They say they have been informed of the zonation of the marine area of the park that is proposed in the draft master plan for the park, but were not consulted during the preparation of the zonation or the master plan. They told us that the fishermen's group that sits on the network of associations of local populations/users set up by the NP managers does not represent the fishermen who fish in the waters of the NP. All three associations claim that their main problem is the trawlers that routinely fish within the waters reserved for them. They say the authorities do nothing to stop this. Trawlers regularly fish within in the boundaries of the marine park and impoverished inhabitants within the park commonly throw dynamite off the cliffs to stun and kill fish for easy capture. No one seems to know where they get the dynamite.

- For creation of the park
- For the development of the management plan
- Those fishing in the park aren't represented in stakeholder network
- Industrial-scale use of trawlers, drift nets in the park
- Dynamite fishing from the cliffs
- A "Paper Park" at this point
- Major governance problems

7 ANALYSIS OF CAS AND USG PROGRAMS

7.1 ANALYSIS OF CAS

Country Assistance Strategy

The four USG priority assistance goals as defined in the September 11 draft of the Country Assistance Strategy are the following:

1. Mitigate drivers of youth disaffection and marginalization;
2. Reduce poverty and increase economic growth;
3. Expand democratic reform and improve governance;
4. Reinforce peace and security.

"The extent to which the actions proposed for support by the Agency meet the needs thus identified."

As formulated, none of these goals are expressly linked to the actions needed for biodiversity and forest conservation in Morocco. The goals of the CAS neither support nor hinder biodiversity and forest conservation. The impact of the CAS on biodiversity conservation will depend on how the CAS goals are translated into concrete actions/programs by USAID, MCC and others.

The second and third goals could potentially have significant positive or negative impacts on biodiversity conservation and are analyzed here in some detail.

Goal 2: ***Reduce poverty and increase economic growth.*** World wide reviews of development and conservation have shown that development activities may contribute to either the conservation or the degradation of forests and biodiversity resources.. There is no systematic linkage. Even though inequitable access to economic opportunity is one of the root causes of natural resource degradation, the impact of development and poverty alleviation will depend on the nature and the context of the interventions.

Section IV C of the Sept 11 Draft of the CAS lists a number of cross-cutting policy issues that hinder rural development. The 118/119 Assessment team believes a critical policy issue has been omitted from the list. The long standing forest sector policy that favors the urban elite for all types of commercial harvest and marketing of biodiversity products from state-owned forest and range lands is a cause of inequity, rural poverty, and natural resource degradation.

This same Section C states that *"…key impediments in the Moroccan context are, most often, not the adoption of new policies, but rather effective implementation at the national and local levels."* The Team believes that in this case, however, the policy on commercial harvest of products from state lands is a policy that needs to be reformed.

Section IV C also states that, *"While MCC will work at the producer or farm level, USAID assistance will emphasize improvements in the broader business enabling environment…"* While the USAID emphasis on policies and enabling environment for business is excellent, the Assessment Team believes that, in the case of community and local business-level involvement in sustainable, biodiversity product-based businesses, the enabling environment

work would need to be accompanied by field-level pilot activities. There is a major opportunity here for rural economic development based on biodiversity products. But market chain development should not be undertaken in the absence of sustainable production systems. For most biodiversity products, this will require new forms of management that directly integrate local communities/rural populations in the management of the resources. For this, there are a few timid and promising initiatives, but a dearth of proven models. The Assessment Team believes there are substantial opportunities for employment creation and revenue generation with strong linkages to improved forest and biodiversity conservation and enhanced watershed management. But to seize these opportunities, the USG will also need to invest in support for the development of field level participatory, sustainable management systems. USAID has been a leader on the continent in the development of participatory natural resource management approaches. The USAID supported Wula Naffa project in Senegal is a good example of the approach that is needed to reduce rural poverty, improve governance, and conserve forest and biodiversity resources.

Goal 3: Expand democratic reform and improve governance. Section V C states, "*Exclusion from economic opportunity dramatically lowers the will of citizens to engage in the political systems and take responsibility for their future."* Once again, the same policy that constrains biodiversity product-based rural development is also a major constraint to improved governance. It is a policy that was developed in the 1920s to favor the elite – the protectorate was governed through the elite. Equity, democracy and good governance were not the driving concerns at that time. This policy is a relic of an inequitable, non-democratic past and needs to be reformed. It is a policy that excludes rural communities from the economic opportunities offered by the biodiversity resources on the state-owned lands that surround them. This is another reason why the policies that favor the urban elite in the marketing of biodiversity products from state lands should be targeted for reform.

Two other statements from Section V C that would further justify the targeting of this policy for reform are the following:

- *"The USG will initiate programs that strengthen organizational capacity, build links between national and local levels, and improve the ability to advocate effectively and support marginalized and disaffected youth.";*
- *…"the USG will assist the GOM in enacting priority legal reforms that promote citizen equality."*

Involving communities in the management of their local, but state-owned, resources is all about how communities organize themselves through representative, "democratic" structures to negotiate power sharing with the state. These same local structures need to develop good governance mechanisms to equitably share the costs of natural resource management and the benefits of natural resource harvesting, processing and marketing. They need to develop strong, internal governance systems for accountability.

7.2 ANALYSIS OF USAID PROGRAM

Red meat value chain

A USAID-funded project called The Integrated Agriculture and Agro-Business Project is working with the sheep/mutton marketing chain in eastern Morocco (Orientale). It has been successful in increasing the financial returns to sheep herders/owners. This project activity is based on a number of hypotheses that should lead to lowered pressures on the range if proven valid, but there is no monitoring system in place to show that this is happening – to test the validity of the hypotheses. There is the possibility of a perverse effect that increased financial returns will lead to increased numbers of investors in sheep grazing and/or increased numbers of sheep on the rangelands and increased degradation of the range and its biodiversity.

The rosemary value chain

The same project has another innovative and highly promising initiative in the same zone targeting the rosemary value chain. The rosemary is on state lands and traditionally has been harvested under the prevailing Forest Service-managed system that normally grants harvest and marketing rights to urban elite under a system of competitive bidding and prepayment for products harvested. The ability of the Forest Service to enforce the contractual conditions of such harvest is typically very poor. The financial benefits to local populations under this system vary from marginal to none.

The project has worked with the Forest Service and local communities, and a rosemary producer cooperative covering several villages has been formed. They have been given a long-term contract for harvesting rosemary on a 22,000 hectare tract. The cooperative takes responsibility for self-policing – the contract with them specifies that they can lose their harvest and marketing rights if they do not respect their contractual obligations. They are contractually bound to use harvest techniques that do not harm the rosemary shrubs. This is reported to be working very well. The project has also been working with the cooperative to develop an essential oils processing facility, to meet quality standards, to gain market access, and to increase value-added. This type of approach might have a very large-scale potential for replication and for application to other biodiversity products such as other aromatic plants, medicinal plants, etc.

This initiative illustrates several positive principles:

- The commercial harvest rights are clearly tied to the contractual conditions of the lease. Under such conditions, local populations will generally be very careful to respect their commitments to avoid losing commercial harvest rights – that they have never benefited from before.
- Cooperatives have traditionally been fraught with many problems – especially problems of governance. However, when local populations know that the cooperative is a necessary mechanism/tool for them if they are to be granted commercial harvest and marketing rights from the state-owned lands, they have a strong incentive to make the cooperative work. Experience in other countries shows that they usually do find ways to make them work.

Rosemary is different from many other plants yielding commercial biodiversity products in that it is highly resistant to grazing pressures. Range management and the decrease in livestock pressures do not seem to be a pre-condition for being able to manage and harvest rosemary sustainably.

7.3 ANALYSIS OF MCC - FUNDED COMPACT GRANT

Agricultural Component

MCC has awarded the GOM a Compact Grant for $700,000,000 and the project is just getting started. The Compact will be implemented by the Partnership for Progress Agency (APP) that has been created specifically for this purpose. The $300 million agriculture component will promote the conversion of marginal, sloping cereal fields to terraced orchards. This activity will be spread across different geographic areas. It will typically target smallholder farmers who have a few hectares of sloping, erodible fields on which they cultivate cereals such as wheat and barley. They sometimes raise sheep and other ruminants that are fed primarily or partially on the cereal fields and they have small areas of other crops, especially tree crops.

If successful, the initiative should have very positive impacts on the cereal fields converted to terraced tree crops with increased infiltration of rainfall and decreased erosion and soil loss. However, there is some potential that the reduction in on farm forage may be partially compensated by increased pressures on open access forest and rangelands found in the vicinity. The newly planted orchards must be protected from grazing and this may substantially decrease the amount of on-farm forage for the livestock. For example,

sheep husbandry in the Middle Atlas is an important part of the farm economy – some maintain that it is more important to the smallholders than their cereal crops. If these smallholders do not have enough on-farm forage for their sheep, they may very well pasture them in the forest and rangelands of the Middle Atlas, or increase the amount of time they keep their sheep in the forest if they already spend part of the year there. The types of farms targeted by APP are frequently interspersed with the forest and range ecosystems of the Middle Atlas.

APP plans to conduct a strategic environmental impact assessment of this agricultural component. This EIA should look very closely at the potential for increased overgrazing and degradation of the forest and rangelands as a result of the initiative and will need to identify possible mitigations measures. It is not readily apparent what those mitigating measures may be.

Coastal Fisheries Component

MCC will also invest in the coastal fisheries value chain. This will include investments in the construction of a new managed fish landing and processing and marketing facilities with greatly improved standards of hygiene. It will also involve the relocation of fishermen to these new fishing villages, improved fishing boats and other fishing gear, capacity building and improved market information and access. This is expected to substantially increase the revenues to fishermen and the returns on investments in the value chain.

The Fisheries Component does not plan work at the level of the management of the fisheries resource. That is considered to be the responsibility of the Ministry of Fisheries and their enforcement agents. As documented in Chapters 3 and 4, many coastal fisheries resources are already badly over-fished and degraded. By improving fishermen's revenues and the returns on investments, there is the potential that the MCC initiative could end up increasing pressures on the coastal fisheries resources and could have negative impacts on marine biodiversity. However, it seems that the project has already taken this into consideration and has taken measures to prevent this. To begin with, there is the government freeze on the number of fishing boats. Many fishing regulations are not well enforced, but it seems that this measure is applied quite effectively. Secondly, none of the 60 PDA will make any investment in port facilities, breakwaters or any other infrastructure that would improve access to the sea. This is done expressly to prevent increased fishing pressures. Access to the sea is a major limiting factor for artisanal fishermen. MCC is seeking to increase returns on the artisanal fisheries value chain without increasing pressures on the fisheries.

The project will be doing a thematic environmental impact assessment of their coastal fisheries component. The EIA should take a fresh look at potential impacts on the level of pressures/overfishing of the coastal fisheries resource.

The Assessment team learned that the Fisheries Component has funding for a research component to test the use of no-take-zones as a coastal fisheries management technique (They are called marine protected areas in the MCC documentation, but they are not to be confused with the large marine protected area components of national parks like Al Hoceima) The assessment team believes that this is an excellent initiative that has the potential to increase both the overall quantity and the average value per kilogram of sea food from managed areas employing this technique. No-take-zones are areas that are set aside by common consent and where no-fishing is allowed. They are permanent no-take-zones. No-take-zones work well for low mobility species, and many such species are found in the coastal waters covering the first several kilometers from shore that are exploited by artisanal fishermen. Low mobility species are also characteristic of the tidal zone and very shallow waters (less than six meters) next to the shore. As far as the Assessment Team was able to determine, the no-take-zone fisheries management technique has not yet been tested in Moroccan waters.

No-take-zones are normally employed, however, in coastal fisheries managed or co-managed by local fishermen's associations or cooperatives. Where such fishermen's groups have been given the fishing rights to fishing grounds with well-defined limits, no-take-zones can be a highly effective management tool. No-take-

zones are generally employed under situations where the local fishermen's groups self-police the no-take-zones. Such empowerment of fishermen's groups requires an appropriate legal instrument. It can work where local fishermen's associations are given exclusive rights to fishing waters with well defined limits. It also works if they only have the rights to impose respect for local fishing regulations, such as the respect for the no-take-zones. MCC has not yet determined whether or not the present legal framework provides a basis for such empowerment.

8 IDENTIFICATION OF OPPORTUNITIES FOR USG SUPPORT

8.1 USG OPPORTUNITIES TO SUPPORT BIODIVERSITY & FOREST CONSERVATION WITHIN THE CAS FRAMEWORK

The Assessment Team believes that there are many opportunities for linking biodiversity and forest conservation to the following two CAS goals:

- Goal 2: Reduce poverty and increase economic growth, and
- Goal 3: Expand democratic reform and improve governance

Furthermore, the Team believes that the greatest opportunities are to be found in projects that combine both goals together with economic opportunities providing the base on which to integrate improved governance. There are many economic development activities to be found amongst a variety of biodiversity-based value chains that are based on forest, range and coastal ecosystems. Specific value chains are identified later in this chapter. Many of the biodiversity-based value chains have the potential for contributing to economic development favoring some of Morocco's most impoverished people. This is certainly true for value chains based on mountainous forest and grassland ecosystems and is also often true for coastal artisanal fisheries and tidal zone fisheries.

Economic development driven by biodiversity-based value chains faces two main challenges:

- They must be based on sustainable use or management of the species that the biodiversity product comes from. The species is part of an ecosystem, so the ecosystem itself must meet minimum requirements for ecological integrity and sustainable use. For example, we saw how the management of clams in Oualidia Lagoon by the women's cooperative came to an early end because of pollution build up in the lagoon.

- Sustainable use requires that there must be an empowered management authority with control over the resource, with the technical capacities for sustainably managing resources and with a reliable system for sustainable financing of the costs of management. Sustainable management generally works best in a system that allows part of the revenues from the commercial use of the biodiversity to be reinvested directly back into management costs.

As explained earlier, these minimum conditions for sustainable use are not commonly found in Morocco. There is very little natural biodiversity left on agricultural lands. Most of Morocco's biodiversity is found on state-owned forest and grazing lands, communal grazing lands, and state-owned marine waters or freshwaters. Management of these state-owned lands and waters has traditionally been handled in a top-down hierarchical fashion that has excluded local resource users from the management of the resource. For State-owned forest and range lands, the prevailing management systems have excluded local populations from the commercial uses of the resource. Herein lays the greatest opportunity and the greatest challenge – to support the development of new management systems that directly involve local resources users in the management of the resources while making them the principal financial beneficiaries of the commercial uses of the resources.

8.2 PROGRAMMING OPPORTUNITIES FOR TERRESTRIAL ECOSYSTEMS

USG support for biodiversity-product value chain-based economic development will typically need to also support the development of participatory management systems. We have seen that, in the case of the rosemary value chain, this can be quite simple and straightforward with relatively low risk. Rosemary may be relatively unique in its high resistance to overgrazing. Participatory management systems that include range management components will inevitably be more complicated and will involve higher levels of risk.

For participatory approaches in general, the time seems to be ripe in Morocco for their development. The two foresters on the Assessment sense that there seems to be a "sea change" taking place in the attitudes and the openness of foresters towards the involvement of local populations in local resources management. This is critical because the development of participatory management systems for state-owned forest and rangelands cannot be effectively done without the participation and the approval of the Forest Service.

Some of the options that could be supported are the following:

- Replication of the support for the rosemary value chain to other sites. This would be relatively low risk.

- Development of a full participatory management system on the 22,000 has covered by the rosemary cooperative near Oujda. This would build on the present success story to develop management systems to include all of the biodiversity products from these steppe ecosystems while integrating watershed function, tourism development and any other opportunities. It would include a range management component. The Forest Service, of course, would need to agree to such an initiative. This definitely involves a higher level of risk. Evaluating the specific level of risk would necessitate an assessment of traditional and modern land tenure systems, the level of support from the Forest Service and local authorities, an assessment of the private sector interests in the livestock sector and other factors.

- Support to participatory development of biodiversity product value chains in conjunction with the Forest Service's program of payments to communities for excluding livestock from forest areas targeted for regeneration (*périmètres mise en défens*) and their program or supporting forest cooperatives as service providers and as timber cutters and merchants. There are many opportunities here for biodiversity product value chain development in favor of the forest cooperatives and of measures that assist in movement towards co-management systems – without directly developing full-blown comanagement systems. Such an approach would be relatively low risk because it does not necessitate the near term development of range management systems.

- Support for full-blown comanagement systems of forest and rangelands. This is the ultimate destination that one wants to achieve. One could directly target the development of such comanagement systems. USAID has been a leader in the development of such systems on the continent. Co-management systems would normally include range a sizable range management component. Direct targeting of co-management systems would involve at moderate to moderately high level of risk.

8.3 LINKAGES WITH WATER SECTOR

USAID informed the Assessment Team that USAID is very interested in working in the water sector and has asked the Team to identify opportunities for linking biodiversity and forest conservation with the water sector.. Water availability is a rapidly growing problem and growing scarcities and shortages are projected for the future. The Assessment Team sees the greatest opportunity for linking biodiversity/forest conservation and the water sector to be found in the watershed management sector. It is the mountainous portions of Morocco's watershed that receive the highest rainfall and that are the most critical for downstream water supply. Forest and range ecosystems in the mountainous area are generally badly degraded from overgrazing. Hillside agriculture in these zones is often marginal and difficult to sustain over time because of soil erosion and declining productivity. Some of the most impoverished sections of the population live in these mountainous watersheds. Most of Morocco's natural forests are found in these watersheds and most of its terrestrial biodiversity.

Morocco has a rich history of watershed management initiatives. The Assessment Team learned that none of these initiatives have ever targeted the improved management of the forest and grasslands of the watershed. They have all been confined to work on agricultural lands and to the creation of limited areas of tree plantations.

The greatest sustainability challenge on forested watershed is to develop range management systems that a) maintain enough grass cover throughout the year to fulfill a proper watershed function (reduced runoff and erosion, increased infiltration and groundwater recharge), and; b) allows for the natural regeneration of the full spectrum of trees and other plants in the forests. All forested watersheds are grazed. Forests present an especially good context for the development of sustainable range management systems because the harvest of marketing of wood products by the local population/herders (in additions to other biodiversity products) should serve as a major incentive for them to reduce their herd size and to adopt sound range management practices. Empowering local herders and the elimination of grazing rights for absentee livestock owners are other key elements to such an approach. It livestock owned by absentee owners are removed, it might not be necessary for local herders to reduce their herd size at all. Dealing with the grazing issue will require diplomacy, political will and a careful analysis of the legal framework.

The Assessment Team strongly supports the concept of USAID support for improved watershed management that would target improved management of forest and/or grasslands. All work on watershed management should include the development of biodiversity-products.

8.4 TERRESTRIAL BIODIVERSITY PRODUCT-BASE VALUE CHAIN DEVELOPMENT OPTIONS

Value chains that may be candidates for such support for rural economic development include the following:

- Aromatic plants that produce essential oils (rosemary, *Artemisia*, *Acacia mollisima* flowers, etc). Rosemary is highly resistant to overgrazing and this value chain could be developed without a range management component. Artemisia is eaten by sheep – developing this value chain would probably necessitate the development of range management systems that ensure adequate regeneration of the *Artemisia.*
- Medicinal plants
- Thatch
- Honey

- Wide variety of mushrooms
- Truffles – also a fungus like mushrooms. Unlike mushrooms, the truffle develops underground.
- All types of wood products
- Non-timber forest products:
  - Non-certified and certified cork
  - Forest fruits – Argon fruit, cork oak acorns, pine nuts, etc.
  - Develop Aleppo pine seeds/nuts as an export to Tunisia (a unique market for these seeds)
  - Carob pods
  - Fruits from wild mulberry
  - *Opuntia* cactus fruits (figues de *barbérie*)

From Wikipedia: The **Black Summer Truffle** (***Tuber aestivum/unicinatum***) thrives in northern Italy, central Europe and the UK but also grows in Turkey and North Africa. It is highly valued for its culinary uses and costs up to $1,500 per kilogram ($670 per pound). Summer truffles do not have as strong an aroma or taste as winter truffles do. They are mainly harvested from June to November. These truffles grow in symbiosis with trees such as oaks, hazels and beech. They can weigh up to 20-30 g, and their shape is generally round, up to 4 cm diameter.

8.5 PROGRAMMING OPPORTUNITIES FOR MARINE AND COASTAL ECOSYSTEMS

Fisheries comanagement employing no-take-zones

The main opportunities identified for marine ecosystems are in the involvement of local fishermen in the management of coastal and tidal zone marine resources. The MCC/APP Compact already includes the testing of no-take-zone fisheries management technique for coastal waters. The Team believes that the only way for this technique to be effective is through the self-policing by empowered fishermen's groups. APP should seek to test this in the context of comanagement systems for coastal waters. They need to find legal mechanisms for empowering fishermen's cooperative to either have exclusive access rights to coastal fishing waters with well-defined limits, or, at a minimum, to be able to impose rules and regulations on all who use the fishing waters that they have been given control over. APP should seek to test comanagement systems in a range of ecological and socio-economic conditions that present themselves within sites where they are working.

Co-management of tidal zone marine resources

In a similar fashion, there is an opportunity for APP to test the development of participatory management systems for tidal zone resources. This is an activity that would best be undertaken with women's cooperatives. APP has a gender component that would seem to be ideally suited for supporting tidal management by women's cooperatives.

APP should seek to identify appropriate legal instruments for empowering women's cooperatives to have exclusive right to sections of the tidal zone. It is thought that the same legal tool used by the Oualidia Women's Clam Cooperative can probably be used. The no-take-zone management technique may also be appropriate for the tidal zone.

Tidal zone biodiversity product chains

Tidal zone and shallow water (less than six meters) value chains include, but are not limited to, the following:

- Sea cucumber
- Sea urchins
- Rock lobster
- Clams (palourdes)
- Sea weed
- Sea beans
- Mussels
- Anelids (a type of worm)

8.6 OPPORTUNITIES FOR SUPPORTING IMPROVED GOVERNANCE

All support for the biodiversity product value chain development and for participatory resource management must include a strong governance component. As we have seen, the present system of state-controlled commercial harvest of forest and biodiversity products from state lands provides little or no benefits/revenues for local populations and creates almost no incentive for communities to conserve their forests. Nearly all forests resources, and much of the range resources, are property of the State. Commercial harvest rights almost always go to relatively wealthy urban dwellers and almost never to local communities. It is a system designed to favor the urban elite. It is a highly inequitable system that marginalizes local communities from the monetary benefits from the marketing of biodiversity products. It is a cause of rural poverty. Receipts from timber sales and other biodiversity products go to local government (the communes). Receiving no legal monetary benefits from the forest, individuals exploit the forest illegally whenever they think they can get away with it.

The main opportunities for US government assistance are in policy reform and in pilot activities for participatory management and marketing of biodiversity products.

8.7 OPPORTUNITIES AND NEEDS FOR POLICY REFORM

There are number of policy reforms that USAID could support that would lead to enhanced biodiversity conservation, economic development and better governance.

- Develop policies, laws and regulations that favor local communities, cooperatives, local businesses as the main beneficiaries of the commercial harvest of biodiversity products from state-owned lands and waters.

- Develop clear policies, laws and regulations for empowerment of coastal fishing communities to have exclusive fishing rights over fishing waters with well-defined limits. Exclusive rights should be dependent upon the communities respect for minimum conditions concerning the sustainable harvest and management of the fisheries resources.

- Develop clear policies/laws/regulation for contracting community level cooperatives/ user groups/ businesses for the harvest of biodiversity products from state-owned lands. The cooperative would play the present role of the "exploitant forestier".

- Develop clear policies, laws and regulations that provide for co-management of state-owned forest and/or range lands;

- Develop policies that create clear incentives for communities/businesses to invest in the regeneration/ restoration/ sustainable management of state-owned lands

8.8 OTHER ECONOMIC DEVELOPMENT OPPORTUNITIES WITH WEAKER LINKS TO BIODIVERSITY AND FOREST CONSERVATION

Local tourism development also presents a range of biodiversity-related development activities that include:

- Community-based tourism development
- No-take zone based coastal tourism
- Mountain/wild area trail development
- Local guide services
- Local lodging/camp sites
- Cultural tourism

Annex A: SOW for the Assessment

A.1 TITLE

Morocco Biodiversity and Tropical Forestry Assessment.

A.2 OBJECTIVE

To conduct a country-wide assessment of biodiversity and tropical forestry conservation needs and related issues for the purposes of complying with Sections 117, 118, and 119 of the Foreign Assistance Act of 1961, as amended, and Agency guidance on country strategy development, under ADS 201.3.8 and ADS 204.5. Based on this needs assessment, provide analysis of proposed actions under USAID's strategy to identify how they contribute to the conservation needs identified.

A.3 BACKGROUND

A. Policies Governing Environmental Procedures

USAID environmental compliance is directed by U.S. policy and law. The Foreign Assistance Act (FAA) of 1961, Section 117, requires that the President take fully into account the impact of foreign assistance programs and projects on environment and natural resources (Section 117 (c)(1)).

Section 118 states that each country development strategy statement or other country plan prepared by the U.S. Agency for International Development shall include an analysis of (1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

Section 119 of the FAA relates to Endangered Species. It states that "the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems and through the protection of wildlife habitats should be an important objective of the United States development assistance" (FAA, Sec. 119 (a)). Furthermore it states, "Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of (1) the actions necessary in that country to conserve biological diversity and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified" (FAA, Sec. 119 (d)).

USAID/Morocco has developed a new country assistance statement for its assistance program to Morocco (2009-2014). To be in compliance with above, and for USAID Missions to effectively determine potential contributions towards natural resources and endangered species, a biodiversity assessment is needed to inform Mission Planning. The purpose of this Task Order is to provide USAID/Morocco and the cooperating country government with this information and analysis.

B. USAID's Program in Morocco

USAID/Morocco's program is designed to enhance sustainable economic growth by boosting Morocco's trade capacity and by improving the business and investment environment. Several high priority policy areas emerge, including priorities related to: water, agriculture policy/reform, trade and investment, bankruptcy, access to credit and labor rigidities. USAID would continue to build on its previous strategy with Ministry of Agriculture and Fisheries and the Ministry of Energy, Water and Environment to assist them to identify and implement appropriate policies, such as institutional reforms, water use efficiency, extension services reforms and others, leading to increased long term growth. Besides, USAID would help address policies affecting the business climate related to bankruptcy procedures, contractual adjudications, commercial systems and others.

USAID/Morocco's new five-year program (2009-2013) includes three major strategic objectives: (1) Accelerating Economic Growth in Disadvantaged Regions; (2) Youth Prepared to Become Productive and Engaged Citizens; (3) More Democratic, Just and Participatory Governance.

As such, USAID/Morocco's program is firmly rooted in the foreign policy goals outlined in the joint State/USAID Strategic Plan which seek to advance the growth of democracy and good governance, strengthen economic growth, and improve education and environment.

A.4 STATEMENT OF WORK

The Contractor shall complete the following activities:

A) Pre-travel informational meetings and information gathering. Prior to traveling to the field, the contractor is expected to:

    1. Hold meetings with the Bureau Environmental Officer (BEO) in the appropriate USAID Washington bureau to ensure full understanding of USAID environmental procedures, the role of the regional bureau in environmental compliance, and purpose of this assignment. This would include policy decisions and approaches that the BEO and agency environmental advisor are taking as per their authority under Reg. 216.

2. Gather and get acquainted with existing background information on Morocco such as the country's natural resources, geographical, ecological and biological specificities, current status of environment and biodiversity, institutional organization on entity and state level, key stakeholders and donors in environment and biodiversity, legislation related to the environment and biodiversity, and other relevant information required for the country assessment.

B) Field a team to conduct an overview and general analysis of the country's biodiversity and its current status. Upon arriving in Morocco the team will:

1. Meet with USAID/Morocco to get a solid understanding of Mission program goals and objectives under its proposed updated strategy statement; perspectives of this assignment and specific interests for the team, including advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The team shall be aware of sensitivities related to an assessment exercise (i.e., the potential for raising expectations, and the need to be clear about the purpose of the assessment) and respect Mission guidance. The team will discuss organizations to be contacted and any planned site visits with the Mission and coordinate as required. USAID/Morocco Mission Environmental Officer (MEO) will facilitate meetings with each USAID Strategic Objective team

2. Hold meetings with donor organizations, NGOs, relevant government agencies, and other organizations that are knowledgeable about biodiversity and tropical forestry conservation or are implementing noteworthy projects and gather information locally.

3. Meet or speak with key stakeholders or managers at the USDA Attaché/US Embassy, and U.S.-based NGOs including World Wildlife Fund, or other organizations involved in biodiversity conservation in Morocco or relevant regional efforts.

4. Conduct no more than two priority site visits, which would supplement understanding of USAID's program, or of biodiversity issues that arise in interviews and literature or would confirm information in previous assessments. Site visits will be determined by the team during the assessment in consultation with the MEO, to the extent possible, and should focus on general areas where USAID is implementing or will likely implement activities (agriculture, water, etc).

C) Assess and summarize the needs for biodiversity and tropical forestry conservation in Morocco based on key threats and analysis of country, donor and NGO responses to meet these needs. Prepare a report on the status of biodiversity, tropical forestry and conservation efforts in Morocco and potential implications for USAID or other donor programming and environmental monitoring which shall define the actions necessary for conservation. The report shall include:

1. The current status of biodiversity, tropical forests, and water resources challenges and problems in Morocco based on current and available information.

2. A broad overview of major ecosystem types, highlighting important, unique aspects of the country's biodiversity, including important endemic species and their habitats. This should also point out major threats to these ecosystems/species and the cause of the threat.
3. Descriptions of natural areas of critical importance to biodiversity conservation, such as forests, wetlands, dry season grazing areas and other areas critical for species reproduction, feeding or migration, if relevant. Particular attention should be given to critical environmental services and non-commercial services they provide (watershed protection, erosion control, soil, fuel wood, water conservation, carbon sequestration, and amenity and recreation). It will also summarize how current land tenure arrangements affect conservation in Morocco.

4. An overview table and map of the status and management of protected area system in Morocco including: an inventory of all declared and proposed areas (national parks, wildlife reserves and refuges, forest reserves, sanctuaries, hunting preserves and other protected areas).
   The inventory will identify the institution responsible for the protection and management of each decreed area, its date of establishment, area, and the protection status of each (i.e., staff in place, management plan published, etc.) In addition to this summary of the current protection and management status of each protected area, an overview of the major threats and challenges facing protected areas in Morocco, including vulnerability of areas to predicted changes in climate, and a brief summary of any recognized economic potential of these areas (including productive assets, environmental services and recreation and tourism opportunities) should be provided.

5. List of plant and animal species that are endangered or threatened with extinction and the broad main threats causing the endangerment (i.e. habitat fragmentation, over-hunting, unsustainable fuel wood collection). Endangered species of particular social, economic or environmental

importance should be highlighted along with potential actions to address conservation of remaining populations. Technical information resources such as the IUCN red list and their websites should be referenced for future Mission access as required. This section should not emphasize species counts, but look at the relation of endangered species and important habitat conservation areas and issues, and evaluate the pressure on those areas, including vulnerability to predicted changes in climate, and current efforts to mitigate pressures, including the participation and compliance with international treaties.

6. Recent, current, and potential *primary* threats to biodiversity, whether they are ecological (i.e., fire, pests), related to human use (i.e., agriculture, contamination), or institutional (i.e., failed policy) or trans-boundary issues, as appropriate. These should emerge from a general assessment of national policies and strategies and their effectiveness, issues related to institutional capacity, trade, private sector growth, participation in international treaties, and the role of civil society.

7. Conservation efforts, their scope and effectiveness. This section also should include recent, current and planned activities by donor organizations that support biodiversity and tropical forestry conservation, identification of multilateral organizations, NGOs, universities, and other local organizations involved in conservation, and a general description of responsible government agencies. A general assessment of the effectiveness of these policies, institutions, and activities to achieve biodiversity conservation should be included. Priority conservation needs that lack donor or local support should be highlighted.

8. Analysis of the current legislation related to the environment and biodiversity. This section should include identification of laws related to protection and management of biological resources and endangered species. It should also point out any differences in laws that require further harmonization. This section should also review international treaties signed and ratified, including but not limited to the Convention on Biological diversity, The UN Convention to Combat Desertification, and the RAMSAR Conventions, as well as those that Morocco needs to sign in order to conserve and manage its biological resources more efficiently.

9. An overview of the major biodiversity and tropical forest conservation activities of the commercial private sector to identify ways to better foster private sector alliances.

Of interest are the norms and standards followed by those commercial entities most engaged in management and use of Morocco's forests and tracts near protected areas, including tourism developers. Also of particular interest is the role of the private sector as relates to other extractive industries, in particular, fisheries. Consideration of policies promoted by the key relevant governmental ministries should also be included.

10. An assessment of how USAID's program and proposed country strategy meets the needs for biodiversity and tropical forestry conservation, consistent with Mission program goals and objectives, through strategic objectives other than environment. For the sections above where threatened ecosystems and species are described, the analysis should indicate potential overlap and interaction with existing and proposed USAID activities (as far as they are known). The assessment shall include recommendations on where U.S. comparative advantages and capabilities are likely to have the greatest impact. These issues and recommendations should be prioritized to identify those requiring the most immediate attention.

If any perceived areas of concern related to USAID's program and its contribution or impact arise during this assessment, the contractor shall provide views and suggestions directly to the Mission Environmental Officer in a separate briefing (with the understanding that this information also goes in the report unless it is immediately resolved).

A.5 DIFFERENTIALS AND ALLOWANCES (JULY 1996)

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A.6 REPORTS AND DELIVERABLES

All reports and PowerPoint presentation will be provided to the TOCTO in hard-copy and in electronic format using Word 2000 and PDF in English. This detailed performance schedule is estimated based on the required tasks and completion dates.

Tasks and Deliverables

1. On or around September 12, 2008 the Consortium leader and Key Personnel will hold a teleconference with the USAID/Morocco MEO to discuss the TO and agree on expectations and site visit criteria and deliverable formats.
2. On or around September 15, 2008 the TO Key Personnel will deliver a detailed proposed methodology and timeline for the 118/119 analysis. Key personnel and MEO will discuss and finalize.

3. Implement agreed upon methodology for the analysis, including appropriate document reviews, interviews, up to two site visits and associated data analysis. Site visits may include USAID participation and must be determined in consultation with the CTO.
4. Prepare draft report for review by MEO, USAID staff, and host country partners. USAID will review the draft focusing on sensitivities and overall strategic focus, not on specific technical findings.
5. Incorporate necessary edits and prepare final report and associated presentation materials.
6. Deliver two presentations of findings, one for an internal USAID/Embassy audience and one (optional) to a broader body of GOM partners.

Specific Deliverables will include:

- **Draft methodology** and timeline.
- **Final methodology** and timeline, including site visits agendas.
- **Preliminary report** addressing Country Assistance Strategy (CAS) concerns should include one page Executive Summary, with a deadline of September 22nd.
- **Final (full) report** submitted in paper and electronic copies within two weeks after receiving comments from USAID on the Draft Final Report. The Draft Final Report is due on or around October 14, 2008. Report must meet all legal USAID formatting requirements. The Final Report should include a 6-8 page Executive Summary.
- **Presentation** of findings in PowerPoint format to be delivered.

The contractor is required to provide in addition to the English versions, a French copy of the final report's Executive Summary and of the Power Point presentation.

IX. KEY REFERENCE DOCUMENTS

In preparing a response, offerors are encouraged to utilize the following key documents for relevant background information:

- USAID/Morocco's Mission Strategy 2005-2009

- Morocco's preliminary 118/119 analysis (2003)

- USAID's Definition of Biodiversity Programs: http://www.usaid.gov/our_work/environment/biodiversity/code.html

- USAID's Biodiversity Conservation Guide for Staff & Partners Biodiversity Conservation: A Guide for USAID Staff and Partners, FY2005 (6.81MB PDF)

A.7 Branding and Marking Plan

ECODIT is familiar with the ADS 320 branding and marking requirements since we have been applying them on all of USAID projects (Jordan, Lebanon, and Afghanistan) since 2005, and by and large even before they were incorporated into existing contracts. ECODIT Home Office is familiar with the details of the Graphic Standards Manual and ADS guidance as it relates to the color palette, typeface, and other graphic elements. ECODIT Home Office staff and the Team Leader will assume primary responsibility in coordination with the long-term and short-term technical teams for implementation of the Branding Implementation Plan described below. We have dedicated HO LOE resources to verify compliance of the ECODIT team with the BIP.

ECODIT will ensure that in activities when the Biodiversity and Tropical Forests Assessment is positioned as being jointly sponsored with other US Government (USG) and non-USG entities, the names and/or logos of these entities will be mentioned in the branding, with an equal level of prominence to the USAID logo. All work will be carried out in partnership with the support and participation of regional governments and institutions approved by USAID for work on this program. By positioning the Assessment as a joint effort, our proposed team will effectively engage and advocate for the framework's adoption by decision makers and shareholders.

The Branding Implementation Plan will comply with the standardized USAID regulations on branding. All branding for USAID, its partners, and other USG and non-USG entities engaged in a specific activity implemented under this task order, will have equal representation on all public or internal documentation, publications, advertising, presentations, brochures, etc. ECODIT will ensure that all appropriate communications clearly convey that the assistance is provided by the American people.

Specifically, ECODIT will implement a Branding Implementation Plan that consists of the following core elements in order to publicize the program to the greatest extent possible:

1. **Written communications** – all non-administrative communications (i.e., letters, faxes, memoranda, etc.) developed by the assessment will incorporate the official USAID brand prominently. A draft letterhead for communications will be provided to the relevant USAID personnel for review prior to issuance of any program communications, and upon clearance by appropriate authorities, be used throughout the implementation period unless revision is requested by USAID or other relevant US Government officials.
2. **Reports** – all technical and other reports developed and produced by this task order (namely the Preliminary Report, Draft Report and Final Report) will prominently identify that the report is a product of US assistance, except where the report is an official publication of cooperating country agencies where such branding

would not serve US interests as determined by relevant US Government official(s).

3. **Meeting materials** – site visits, professional photography, emails, and other printed materials, if any, also will comply with USAID branding requirements, with a similar exception where such identification is determined by relevant US Government officials not to be in US interest.
4. **Marking** – any computers, desks, or other similar items of furniture, fixtures and equipment, other commodities, public communications, or commodities implemented or delivered under contracts or subcontracts exclusively funded by USAID will be marked exclusively with the USAID Identity. Where applicable, a host-country symbol or ministry logo, or another U.S. Government logo may be added.

ECODIT will prominently present the USAID brand and incorporate the message "This is from the American People" during the following major activities that are anticipated to generate awareness that the program is from the American people:

1. **All meetings and field visits**
2. **Preliminary Report**
3. **PowerPoint Presentation**
4. **Draft Final and Final Reports**

ECODIT will maintain, primarily through its Team Leader, close coordination with relevant staff and officials of the USAID mission, other USG agencies, and/or Embassies in Morocco regarding dynamics of the political and cultural situation in the country and the effects of conditions on the level of prominence that USAID and other US Government agencies want to maintain. ECODIT will comply with ADS 320 requirements while also remaining flexible and responsive to changes in overall US Government interests served through branding and marking.

A.8 TECHNICAL DIRECTIONS

This activity is managed by USAID/Morocco's Mission Environmental Officer (MEO). The consultants will report directly to the MEO for the implementation of this program for both administrative and technical directions.

A.9 PERIOD OF PERFORMANCE

The Biodiversity and Tropical Forest Background Assessment Study will be carried out to update the Tropical Forestry (FAA 118) and Biodiversity (FAA 119) desk study that was conducted for the five - year strategy for USAID/Morocco's overall assistance program (2005-2009) that was developed in 2003. Contractor will conduct a

preliminary desk study and issue a preliminary report of the 118/119 analysis to be completed no later than September 22nd, 2008 for the Mission to meet the CAS submission deadline set for September 30, 2008. The team leader must review and approve this report prior to this date. This activity starts on September 1, 2008 and ends on November 30, 2008.

A.10 KEY PERSONNEL

a. The following positions are listed as key personnel under this task order:

Name	Title
Roy Hagen	Team Leader-Biodiversity Conservation Specialist
Mohamed Menioui	Biodiversity Specialist
Said Messat	Forestry Specialist
Mohamed Rouchdi	GIS Specialist

b. The personnel specified above are considered to be essential to the work being performed hereunder. Prior to replacing any of the specified individuals, the Contractor shall immediately notify both the Contracting Officer and Task Order Cognizant Technical Officer reasonably in advance and shall submit written justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the program. No replacement of personnel shall be made by the Contractor without the written consent of the Contracting Officer.

All KEY PERSONNEL & TECHNICAL EXPERTISE (French fluency is highly desirable):

We have described in minimum requirements for all the following key personnel and preferred qualifications, according to our Government estimate. However, the contractor may propose its own team necessary to complete the work in the required time frame, including a mix of expatriates and Moroccan staff. A six day work week while contractor is in Morocco will be approved by USAID.

Biodiversity Conservation Specialist & Team Leader
The lead consultant will have an advanced degree in conservation biology, wildlife biology, conservation management or related specialization with no less than seven years experience in international conservation. The person should have solid team leadership and evaluation experience and will have experience leading similar biodiversity and forestry conservation analyses. Other key characteristics will include excellent communication skills (oral and written), analytic skills, and strong interpersonal skills. Familiarity with USAID programs is strongly preferred.

Biodiversity and Forestry Specialists
Specialists in biodiversity and forestry with a focus on environmental management, environmental issues related to agriculture, tree crops, coastal zones management, soil degradation and impacts of infrastructure. Moroccan experience desired; knowledge of developing country context for environmental management required. Some knowledge of urban pollution, waste management and other urban environmental issues desired. At least MSc level.

Mapping and GIS Specialist
Extensive experience in GIS and mapping for environmental and/or conservation projects. Knowledge of visualization applications required. Specialist will be required to understand data collection and management in the context of a post-crisis country and be able to build capacity of local institutions. Specialist will need to be able to work effectively with Moroccan institutions and clients within the Government of Morocco, USAID and other partners to assess data needs and assist them with understanding and integrating adaptive management into planning. Moroccan experience preferred. The LOE for this position is envisioned as no more than 5 days.

Urban Environmental Specialist

If in preparing the proposal, the contractor determines that urban issues may have a significant impact on biodiversity and tropical forests in Morocco, a specialist in urban issues could be added to the team. Moroccan experience desired; knowledge of developing country context for environmental management required. Knowledge of urban pollution, waste management and other urban environmental issues desired.

NOTE: One of above team members must have relevant experience in analyzing the legal and regulatory aspects of environmental management.

A.11 RESPONSIBILITIES AND RELATIONSHIPS

This activity is managed by USAID/Morocco's Mission Environmental Officer (MEO). The consultants will report directly to the MEO for the implementation of this program for both administrative and technical directions.

Annex B: Biodata Sketches of Assessment Team Members

Roy Hagen, Biodiversity Conservation Specialist and Team Leader

Roy Hagen has B.S. and M.S degrees in forestry from the University of Minnesota with a strong emphasis on ecology and remote sensing. Mr. Hagen has made a lifetime career in natural resource management and conservation, working primarily in Africa and the Western Indian Ocean and primarily in francophone countries. Mr. Hagen has worked for a very wide variety of development and conservation agencies and has been team leader on dozens of missions covering project development, project evaluation, assessments and strategy development. Mr. Hagen has extensive experience on GEF biodiversity project design and evaluation over the past 14 years and in sustainable land management projects over the past five years. Mr. Hagen was an arboretum manager at Oued Cherrate as a Peace Corps Volunteer in the early 1970s, working for the Moroccan Forest Research Station. He conducted a project identification mission for a watershed management project for USAID in the late 80s and was the lead project development specialist for the UNDP/GEF integrated forest ecosystems management project in the Middle Atlas in 2005. This project focuses on community-based co-management of range and forest resources and is just getting started.

Dr. Said Messat, Forestry Specialist

Dr. Messat has a Ph.D. in Forest Management and Planning (Univ. of Idaho, USA) and a State Doctorate in Forest Ecology and Environment (IAV, Morocco). He was professor of forest management and planning (ENFI and IAV Morocco) for more than twenty five years. Dr. Messat was head of the Forest Economics Division of the "Direction des Eaux et Forêts et de la Conservation des Sols" (Ministry of Agriculture) for over five years. He was responsible for different national studies (Eucalyptus – Cork Oak, Fire Wood, Forest Development Plan -Phase II-…) under FAO, African Bank for Development and World Bank forestry programs. Dr. Messat has more than six years experience in developing countries as FAO Community Forestry Specialist in (Yemen and Jordan), and FAO/UNDP Desertification Planning specialist (Tunisia, Yemen). He was responsible for the "Development of an Integrated Plan for Biodiversity Conservation" as a forestry expert (Ministry of Agriculture/UNDP-Morocco). Dr. Messat conducted several evaluation missions as Team Leader for FAO projects (Yemen and Senegal) and actively participated in the formulation of several field projects/programs for FAO and UNDP (Yemen, Iraq, Saudi Arabia…).

Dr. Mohamed Menioui, marine and freshwater Biodiversity Specialist

Dr. Menioui is an oceanographer/biologist and specialist in biodiversity and ecology. He holds a DEA in Mediterranean ecology from the University of Marseille, a Ph.D. in Marine Biology from the Oceanography Center of Marseille and a State Doctorate in Oceanography from the University of Rabat. He has taught oceanography and biodiversity for more than twenty five years at several Moroccan academic institutions (IAV Hassan II, Faculties of Sciences of Rabat, Oujda, Tétouan, Fès, etc.). Dr. Menioui has discovered and described several new marine species and was head of department of zoology and animal ecology. He has been charged with the preparation of The National Strategy for the Conservation and the Sustainable Use of Biodiversity, the National Action Plan on Biodiversity and the three national reports on biodiversity required by the Convention on Biological Diversity. He is currently Morocco's focal point for the "Global Taxonomy Initiative". This initiative is charged with the development of a "National Strategy for Education and Increased Awareness on the Environment and Sustainable Development". Dr. Menioui has also been the ad-hoc international expert for the CBD and a member of a group of experts for "Technical Advice on the Establishment and Management of National Systems of Marine and Coastal Protected Areas."

Mohammad Rouchdi, Mapping and GIS Specialist

Dr. Rouchdi has a Ph.D. in Surveying and Mapping (Institut Agronomique et Vétérinaire at Hassan II University in Rabat, Morocco) and an M.S. in Geodetic Science and Surveying. Dr. Rouchdi has extensive experience in mapping and GIS processing of Morocco. He has worked as Team Coordinator or Expert Team Member for FAO, GTZ, World Bank, State Environmental Secretariat, IAV Hassan II, and UNDP, to name a few. Throughout Dr. Rouchdi's career, he has directly compiled, produced, or supervised the production of maps that depict the changing environment of Morocco by using remote-sensing, satellite imagery, data and spatial analysis and verification, and database compilation. From 2003 – 2006, Dr. Rouchdi served as GIS-Remote Sensing Cartography Specialist for ADI and the State Environmental Secretariat in Souss, Morocco. During these three years, Dr. Rouchdi accurately defined and analyzed sensitive areas of desertification in Morocco and established a database and interface with ArcGIS. He again defined and mapped areas sensitive to desertification based on in-depth analysis of soil quality, climate, vegetation, and socioeconomic factors as the Expert in GIS and Cartography for GTZ in 2007.

Annex C: Methodology for the 118/119 Assessment

Roy Hagen September 17, 2008
USAID Contractor, ECODIT Team Leader for the Assessment

The Key documents defining the work to be done are the following:

- The text of the 118 and 119 legislation
- The two 118/119 guidelines and best practices documents prepared by USAID in 2005
- The TOR for the evaluation

Based on a reading of these documents, and based on meetings with key people in Washington and at the USAID Mission in Rabat, the Assessment will place its strongest focus primarily on the two following objectives:

- The definition of the priority actions needed to conserve biodiversity and forests in Morocco;
- An analysis of how well the draft CAS and the USAID and other US government programs in Morocco support the actions needed to conserve biodiversity and forests along with recommendations for how biodiversity and forest conservation can best be effectively integrated into the ongoing and planned programs;

The Preliminary Analysis of 2003 is especially strong on background information on Morocco's biodiversity, its importance and on measures undertaken for its conservation. The current Assessment will update and complete this information as possible. But the thrust of the current assessment will be on the strategic analysis of the key constraints to biodiversity/forest conservation, the definition of actions needed to overcome these constraints, the analysis of the effectiveness of current conservation measures and on the development of recommendations for improving the effectiveness of the USAID/US Government programs in regards to biodiversity/forest conservation.

The methodology will be very strongly conditioned by a time constraint that is imposed on the team. In order for the Assessment to be integrated into the CAS, the TOR for this assessment requires that the team complete a Preliminary Report by September 22. The Team is, therefore, obliged to concentrate very early on the strategic sections of the final report that would normally be developed towards the end of the mission. Fortunately, the ECODIT team has the knowledge and experience to complete this challenging task effectively.

The methodology for the preparation of the Preliminary Report during the week of Sept 15 will be the following:

- Review of key documents, including the draft CAS;
- Development of a draft Table of Contents for the Preliminary Report and assignment of writing responsibilities (Outline is presented in ***Annex A***)
- A limited number of meetings/interviews with key individuals selected for the breadth of their knowledge on different aspects of biodiversity/forest conservation and/or their capacity to "think outside the box" on innovative strategies/solutions for improving the effectiveness of conservation measures. (USAID has been consulted on the choice of the key people to meet during the first week.)
- Brainstorming sessions of the Assessment Team to develop consensus on key points – especially the constraints to effective conservation, the actions needed to overcome these constraints and

the identification of opportunities for USAID and other US government institutions to integrate some of these actions into their strategy and programs
- Compilation of the Preliminary Report for delivery on Sept 22.

The key meetings during the first week are the following:
- Mission Environmental Officer at USAID
- The Acting Head of Parks and Reserves
- The Director of Forest Development
- The Director of Environment for the MCC project
- The Project Officer of the USAID-funded Integrated Agriculture and Agribusiness Project

Methodology for the completion of the mission beyond the preliminary report

Additional work leading up to the completion of the full draft report will be the following:
- Integration of feed-back from USAID into planning for completion of work
- Revise initial report outline in greater detail
- Site visits (see below)
- Additional meetings and interviews
- Analysis of additional documentation
- Power point presentation to USAID on key preliminary findings and recommendations
- Power point presentation to a broader group of stakeholders
- Team discussions to reach consensus on key finding and recommendations
- Complete full draft of report
- Revise report based on comments received

Planning of the Field Visits will be done in consultation with USAID. The preliminary criteria for the selection of the sites are the following. Two trips covering two different geographic regions over a maximum of eight days are planned.
- Sites that are representative of key threats to priority sites for biodiversity and forest conservation;
- Sites that represent as wide a range of ecosystems as possible;
- Sites where especially promising or proven or innovative approaches are being tested/implemented;
- At least one trip should focus on conservation of forest ecosystems;
- Sites where there are ongoing or planned USAID/US Government funded activities that impact on biodiversity/forest conservation and water resources;
- Sites where there are innovative partnerships between government and communities/user groups/private sector for the management and exploitation of biodiversity/forests.
- Field visits should cover a mix of sustainable use and protected areas
- Logistical considerations of travel time needed

Timeline At this point, we are still planning to follow the initial timeline. The specific dates of the field visits may change due to practical considerations of logistics/availability of staff at field sites, etc.

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http://www.iisd.org/
http://www.iucn.org/
http://www.pnud.org.ma/programme.asp?s=p&m=7&r=45

Annex E: List of Persons Contacted

USA

Big Lake near Cloquet, Minnesota

September 8, 2008

1. Tim Resch, Bureau Environmental Advisor, USAID Bureau for Africa, Office of Sustainable Development/EGEA

Washington, DC

September 11, 2008

2. LeAnna Marr, Outgoing Desk Officer for Morocco
3. Cristophe Tocco, Incoming Desk Officer for Morocco
4. Karl Wurster, Incoming Program Officer for USAID/Morocco
5. Rebecca Hilbruner (telephone link)

September 12, 2008

6. J. Wilson, ANE Bureau Environmental Officer

MOROCCO

Rabat

September 15, 2008

USAID

7. Jaouad Bahaji. Chef de Projet. Economic Growth Department
8. Steve FitzGerald. Development Assistant. Economic Growth Department
9. Nadia Amrani. Program Manager. Economic Growth Division

MCC –Program

10. Jaafer Bouljiouch, Director of the Environment, Partnership for Progress Agency (APP -- implementing agency for MCC funding)
11. Wafaa Boumédiane, Fisheries Director of Fisheries Component, APP

September 16, 2008

Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification

12. Abdellah El Mastour. Chief of Parks and Natural Reserves Management Service
13. Bouzemmouri. Director of Forest Development Directorate

Chemonics, USAID contractor

14. Mario Kerby. Director of Agriculture and Agribusiness Integres Project. Chemonics, USAID contractor

September 17, 2008

Centre de Recherche Forestière

15. Hassan Sbay. Génétique Forestière
16. Mohamed Boulmane. Séquestration de Carbone
17. Mohamed Ghanmi. Plantes Aromatiques et Médicinales
18. Mohamed Bellaka. Centre Régional de Marrakech. Sylvopastoralisme
19. Abdelaziz El Alami. Coordonateur du Projet Thuya
20. Rachid Ilmen. Chargé Programme Changement Climatique
21. Abderrahman Aafi. Ecologie, Biodiversité et Conservation des Sols
22. Abdelhak Elabio. Technologie et Valorisation des Produits Forestiers
23. Mohamed Benzyane. Directeur du Centre
24. Salwa Elantry. Sylviculture et Santé des Forêts
25. Driss Ghaioule. Sylviculture et Santé des Forêts
26. Mohamed Yassin. Climatologie et Lutte contre la Désertification

WWF

27. Imad Cherkaoui. Freshwater Project Coordinator for Morocco
28. Maryem El Madani. Freshwater Project
29. Youssef Melhaoui. Forest Programme Coordinator

MCC –Program

30. Jaafer Bouljiouch
31. Wafaa Boumédiane, Director of Fisheries Component, APP

September 25, 2008

IAV Hassan II

32. Jadri Rchida, FEDER association
33. Birouk Ahmed, Agrobiodiversity specialist

Oualidia (south of El Jadida)

September 30, 2008

34. Ahmed Kamal, Sous-Délégation de la Pèche
35. Kabboura Head of women's cooperative
36. Saida, Member of women's cooperative
37. Farouk Mhamed, President of fishermen's cooperative

Al Hoceima

October 06, 2008

NGO Rif Bads Association

38. Anissa Khattabi. Member of the association.

NGO – « AGIR » Association

39. Houssine Nibani. President of AGIR Association for Integrated Resources Management.
40. Abdelouahed KaiKai. Member of AGIR Association and Coordinator of traditional fishing

Provincial Forest Service

41. Bouchta Lachhab. Chief of Provincial Forest Service

Fishermen Groups

42. Fikri Elidrissi. President of Talayoussef Association.
43. Hakim Dira Director General of artisanal fishing syndicate
44. Najib Afrass. Cooperative Tensouare
45. Pablo Perez-Nievas. Coordinator IPADE

Meknès

46. Noreddine Tahsa. Coordinator of the UNDP/GEF Integrated Ecosystem Management of the Middle Atlas Forests Project

Kénitra

October 07, 2008

Regional Directorate of Forest Service

47. Salah Chamikh. Responsible of forest cooperatives
48. Lahcen Amâoun. Forest engineer
49. Mohamed Farhat. Director of regional forest service

Sidi Yahya du Rharb

Forest Development Centre

50. Sanaa Moujani. Responsible of forest development
51. Driss Chkerni. Administrator of GIE CO (Groupe d'Intérêt Economique)

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October 09, 2008

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52. El kébir Mdarhri Alaoui. Environment and Sustainable Development Adviser
53. Myriem Ouchen Noussairi. Programme Officer. Environment Unit

Annex F: Sections of 117, 118, 119 of the FAA

Foreign Assistance Act, Part I, Section 117 - Environment and Natural Resources

(a) The Congress finds that if current trends in the degradation of natural resources in developing countries continue, they will severely undermine the best efforts to meet basic human needs, to achieve sustained economic growth, and to prevent international tension and conflict. The Congress also finds that the world faces enormous, urgent, and complex problems, with respect to natural resources, which require new forms of cooperation between the United States and developing countries to prevent such problems from becoming unmanageable. It is, therefore, in the economic and security interests of the United States to provide leadership both in thoroughly reassessing policies relating to natural resources and the environment, and in cooperating extensively with developing countries in order to achieve environmentally sound development.

> (a) The President is authorized to furnish assistance under this part for developing and strengthening the capacity of less developed countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible restore the land, vegetation, water, wildlife and other resources upon which depend economic growth and human well-being especially that of the poor.
>
> (b) In carrying out programs under this chapter, the President shall take into consideration the environmental consequence of development actions.". See also sec. 534 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (Public Law 101-167; 103 Stat. 1228), as amended, relating to ``Global Warming Initiative". See also sec. 533 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1991 (Public Law 101-513; 104 Stat. 2013), as amended, relating to ``Environment and Global Warming". See also sec. 532 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1993 (Public Law 102-391; 106 Stat. 1666), relating to "Environment".

(b) In order to address the serious problems described in subsection (a), the President is authorized to furnish assistance under this part for developing and strengthening the capacity of developing countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible to restore the land, vegetation, water, wildlife, and other resources upon which depend economic growth and human well-being, especially of the poor.

(c)(1) The President, in implementing programs and projects under this chapter and chapter 10 of this part,\72\ shall take fully into account the impact of such programs and projects upon the environment and natural resources of developing countries. Subject to such procedures as the President considers appropriate, the President shall require all agencies and officials responsible for programs or projects under this chapter-

\72\ Sec. 562 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1991 (Public Law 101-513; 104 Stat. 2026), added a new chapter 10 to part I of this Act, providing for long-term development in sub-Saharan Africa, and made a conforming amendment by inserting ``and chapter 10 of this part" here.

(A) to prepare and take fully into account an environmental impact statement for any program or project under this chapter significantly affecting the environment of the global commons outside the jurisdiction of

any country, the environment of the United States, or other aspects of the environment which the President may specify; and

(B) to prepare and take fully into account an environmental assessment of any proposed program or project under this chapter significantly affecting the environment of any foreign country. Such agencies and officials should, where appropriate, use local technical resources in preparing environmental impact statements and environmental assessments pursuant to this subsection.

(2) The President may establish exceptions from the requirements of this subsection for emergency conditions and for cases in which compliance with those requirements would be seriously detrimental to the foreign policy interests of the United States.

Sec. 118 Tropical Forests

(a) Importance of Forests and Tree Cover.--In enacting section 103(b)(3) of this Act the Congress recognized the importance of forests and tree cover to the developing countries. The Congress is particularly concerned about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries, which pose a serious threat to development and the environment. Tropical forest destruction and loss--

> (1) result in shortages of wood, especially wood for fuel; loss of biologically productive wetlands; siltation of lakes, reservoirs, and irrigation systems; floods; destruction of indigenous peoples; extinction of plant and animal species; reduced capacity for food production; and loss of genetic resources; and
>
> (2) can result in desertification and destabilization of the earth's climate. Properly managed tropical forests provide a sustained flow of resources essential to the economic growth of developing countries, as well as genetic resources of value to developed and developing countries alike.

(b) Priorities.--The concerns expressed in subsection (a) and the recommendations of the United States Interagency Task Force on Tropical Forests shall be given high priority by the President--

> (1) in formulating and carrying out programs and policies with respect to developing countries, including those relating to bilateral and multilateral assistance and those relating to private sector activities; and
>
> (2) in seeking opportunities to coordinate public and private development and investment activities which affect forests in developing countries.

(c) Assistance to Developing Countries.--In providing assistance to developing countries, the President shall do the following:

> (1) Place a high priority on conservation and sustainable management of tropical forests.
>
> (2) To the fullest extent feasible, engage in dialogues and exchanges of information with recipient countries--
>
> > (A) which stress the importance of conserving and sustainably managing forest resources for the long-term economic benefit of those countries, as well as the irreversible losses associated with forest destruction, and

(B) which identify and focus on policies of those countries which directly or indirectly contribute to deforestation.

(3) To the fullest extent feasible, support projects and activities--

(A) which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and

(B) which help developing countries identify and implement alternatives to colonizing forested areas.

(4) To the fullest extent feasible, support training programs, educational efforts, and the establishment or strengthening of institutions which increase the capacity of developing countries to formulate forest policies, engage in relevant land-use planning, and otherwise improve the management of their forests.

(5) To the fullest extent feasible, help end destructive slash-and-burn agriculture by supporting stable and productive farming practices in areas already cleared or degraded and on lands which inevitably will be settled, with special emphasis on demonstrating the feasibility of agroforestry and other techniques which use technologies and methods suited to the local environment and traditional agricultural techniques and feature close consultation with and involvement of local people.

(6) To the fullest extent feasible, help conserve forests which have not yet been degraded, by helping to increase production on lands already cleared or degraded through support of reforestation, fuelwood, and other sustainable forestry projects and practices, making sure that local people are involved at all stages of project design and implementation.

(7) To the fullest extent feasible, support projects and other activities to conserve forested watersheds and rehabilitate those which have been deforested, making sure that local people are involved at all stages of project design and implementation.

(8) To the fullest extent feasible, support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing, including reforestation, soil conservation, and other activities to rehabilitate degraded forest lands.

(9) To the fullest extent feasible, support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation, including research in agroforestry, sustainable management of natural forests, small-scale farms and gardens, small-scale animal husbandry, wider application of adopted traditional practices, and suitable crops and crop combinations.

(10) To the fullest extent feasible, conserve biological diversity in forest areas by--

(A) supporting and cooperating with United States Government agencies, other donors (both bilateral and multilateral), and other appropriate governmental, intergovernmental, and nongovernmental organizations in efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis;

(B) whenever appropriate, making the establishment of protected areas a condition of support for activities involving forest clearance of degradation; and

(C) helping developing countries identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas.

(11) To the fullest extent feasible, engage in efforts to increase the awareness of United States Government agencies and other donors, both bilateral and multilateral, of the immediate and long-term value of tropical forests.

(12) To the fullest extent feasible, utilize the resources and abilities of all relevant United States Government agencies.

(13) Require that any program or project under this chapter significantly affecting tropical forests (including projects involving the planting of exotic plant species)--

(A) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and
(B) take full account of the environmental impacts of the proposed activities on biological diversity, as provided for in the environmental procedures of the Agency for International Development.

(14) Deny assistance under this chapter for--

(A) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner which minimizes forest destruction and that the proposed activity will produce positive economic benefits and sustainable forest management systems; and
(B) actions which significantly degrade national parks or similar protected areas which contain tropical forests or introduce exotic plants or animals into such areas.

(15) Deny assistance under this chapter for the following activities unless an environmental assessment indicates that the proposed activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development:

(A) Activities which would result in the conversion of forest lands to the rearing of livestock.

(B) The construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands.

(C) The colonization of forest lands.

(D) The construction of dams or other water control structures which flood relatively undegraded forest lands.

(d) PVOs and Other Nongovernmental Organizations.--Whenever feasible, the President shall accomplish the objectives of this section through projects managed by private and voluntary organizations or

international, regional, or national nongovernmental organizations which are active in the region or country where the project is located.

(e) Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-

(1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(f) Annual Report.--Each annual report required by section 634(a) of this Act shall include a report on the implementation of this section.

Sec. 119 Endangered Species

(a) The Congress finds the survival of many animal and plant species is endangered by overhunting, by the presence of toxic chemicals in water, air and soil, and by the destruction of habitats. The Congress further finds that the extinction of animal and plant species is an irreparable loss with potentially serious environmental and economic consequences for developing and developed countries alike. Accordingly, the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems, and through the protection of wildlife habitats should be an important objective of the United States development assistance.

(b) \75\ In order to preserve biological diversity, the President is authorized to furnish assistance under this part, notwithstanding section 660,\76\ to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments.

(c) \77\ Funding Level.--For fiscal year 1987, not less than $2,500,000 of the funds available to carry out this part (excluding funds made available to carry out section 104(c)(2), relating to the Child Survival Fund) shall be allocated for assistance pursuant to subsection (b) for activities which were not funded prior to fiscal year 1987. In addition, the Agency for International Development shall, to the fullest extent possible, continue and increase assistance pursuant to subsection (b) for activities for which assistance was provided in fiscal years prior to fiscal year 1987.

\77\ Pars. (c) through (h) were added by sec. 302 of Public Law 99- 529 (100 Stat. 3017).

(d) \77\ Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-

(1) the actions necessary in that country to conserve biological diversity, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(e) \77\ Local Involvement.--To the fullest extent possible, projects supported under this section shall include close consultation with and involvement of local people at all stages of design and implementation.

(f) \77\ PVOs and Other Nongovernmental Organizations.-- Whenever feasible, the objectives of this section shall be accomplished through projects managed by appropriate private and voluntary organizations, or international, regional, or national nongovernmental organizations, which are active in the region or country where the project is located.

(g) \77\ Actions by AID.--The Administrator of the Agency for International Development shall-(1) cooperate with appropriate international organizations, both governmental and nongovernmental;

(2) look to the World Conservation Strategy as an overall guide for actions to conserve biological diversity;

(3) engage in dialogues and exchanges of information with recipient countries which stress the importance of conserving biological diversity for the long-term economic benefit of those countries and which identify and focus on policies of those countries which directly or indirectly contribute to loss of biological diversity;

(4) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity;

(5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph

(6), and the United States agrees to provide, subject to obtaining the necessary appropriations, additional assistance necessary for the establishment and maintenance of such protected areas;

(6) support, as necessary and in cooperation with the appropriate governmental and nongovernmental organizations, efforts to identify and survey ecosystems in recipient countries worthy of protection;

(7) cooperate with and support the relevant efforts of other agencies of the United States Government, including the United States Fish and Wildlife Service, the National Park Service, the Forest Service, and the Peace Corps;

(8) review the Agency's environmental regulations and revise them as necessary to ensure that ongoing and proposed actions by the Agency do not inadvertently endanger wildlife species or their critical habitats, harm protected areas, or have other adverse impacts on biological diversity (and shall report to the Congress within a year after the date of enactment of this paragraph on the actions taken pursuant to this paragraph);

(9) ensure that environmental profiles sponsored by the Agency include information needed for conservation of biological diversity; and

(10) deny any direct or indirect assistance under this chapter for actions which significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas.

(h) \77\ Annual Reports.--Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this section.

Annex G: Maps related to Biodiversity and Forests

Maps and data related to biodiversity and forest conservation are presented in this annex. The maps have all been prepared in GIS format by Assessment Team member Mohamed Rouchdi. The titles of the maps along with notes on their relevance and usefulness are presented here.

1. **BIOCLIMATIC ZONES MOROCCO** The terrestrial ecosystems and biodiversity of Morocco are directly linked to Morocco's bioclimatic zones.

2. **ECOREGIONS DU MAROC** This map represents the natural eco-regional differences and the general types of ecosystems that existed before the arrival of man. All ecosystems have been altered by man but the areas of sclerophyllous forest (characterized by broadleaf trees and shrubs with leathery drought resistant foliage) have generally been the most severely altered because much of this eco-region has been converted into Morocco's principal agricultural areas.

3. **FOREST ECOSYSTEMS AND** WATERSHEDS Given USAID's interest in working in the water sector, forest ecosystems and watershed have bee combined on the same map. The forest ecosystems are those used for the national forest inventory.

4. **NATIONAL PARKS OF MOROCCO**

5. **SITES OF BIOLGICAL AND ECOLOGICAL INTEREST (SIBE)** WETLANDS. The SIBE are too numerous to display easily on a single map, so they have are broken down into Wetland and Terrestrial categories. The SIBES are candidate areas for the creation of new protected areas.

6. **SITES OF BIOLGICAL AND ECOLOGICAL INTEREST (SIBE) TERRESTRIAL**

7. **SITES OF BIOLGICAL AND ECOLOGICAL -- CONTINENTAL WETLANDS** Basic data on SIBE are presented in this table and the following two tables.

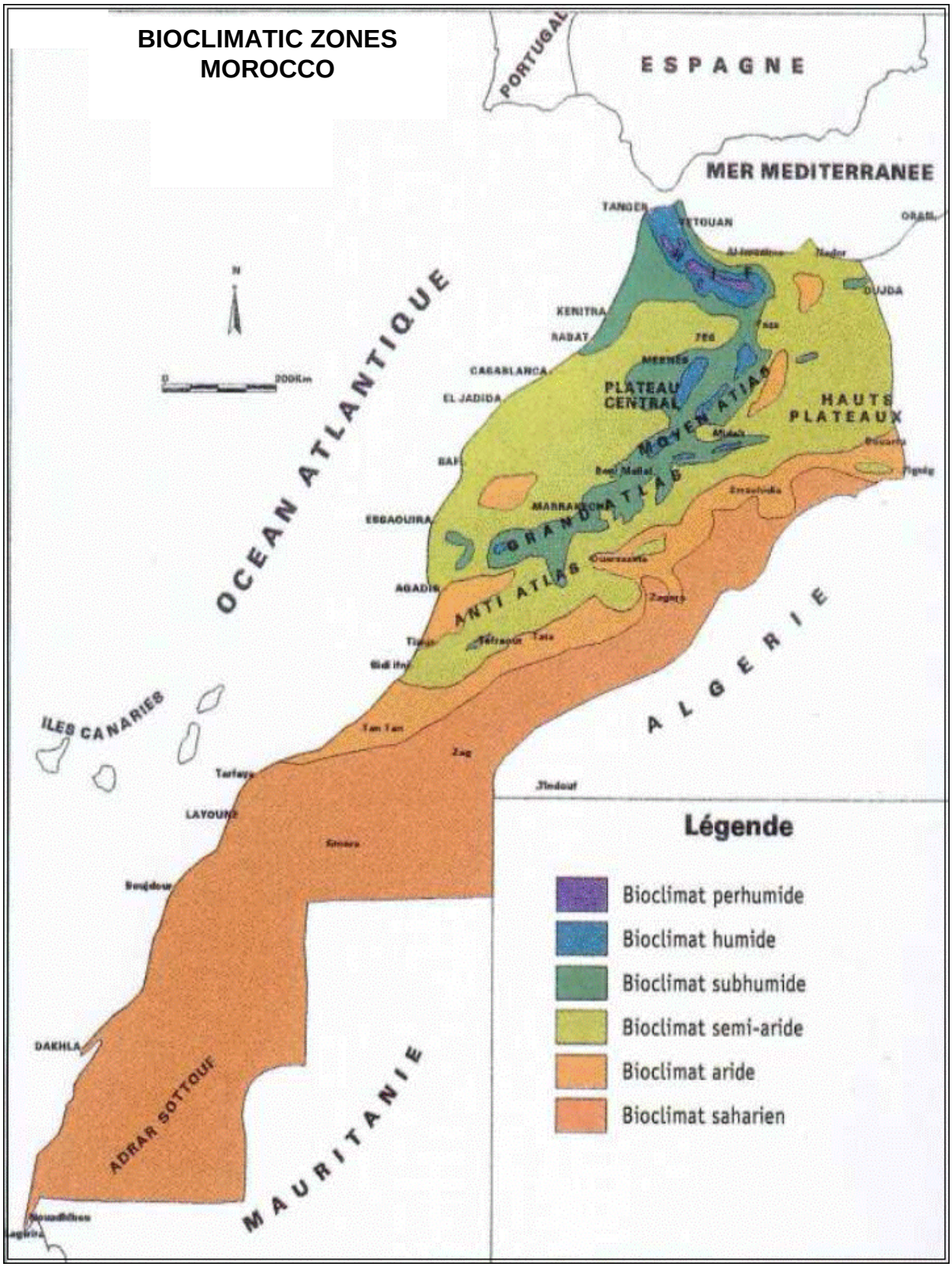
8. **SITES OF BIOLGICAL AND ECOLOGICAL -- COASTAL WETLANDS**

9. **SITES OF BIOLGICAL AND ECOLOGICAL – TERRESTRIAL SITES**

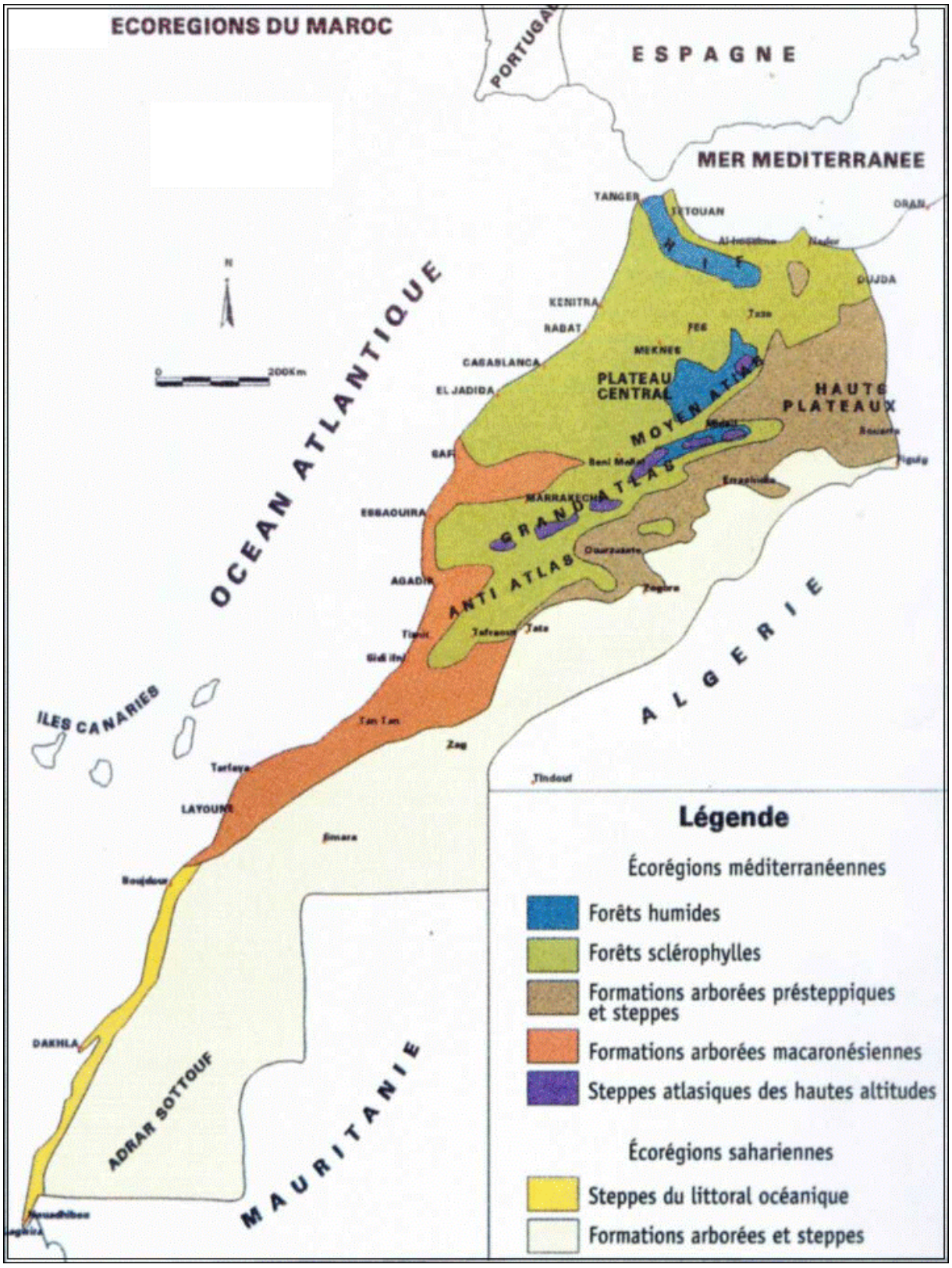
10. **DAMS AND WATERSHEDS – MOROCCO** This map is of interest if one wishes to target the watershed above a specific reservoir.

11. **POPULATION (2004 CENSUS) MOROCCO** This map presents a ranking of the total population for each region of Morocco.

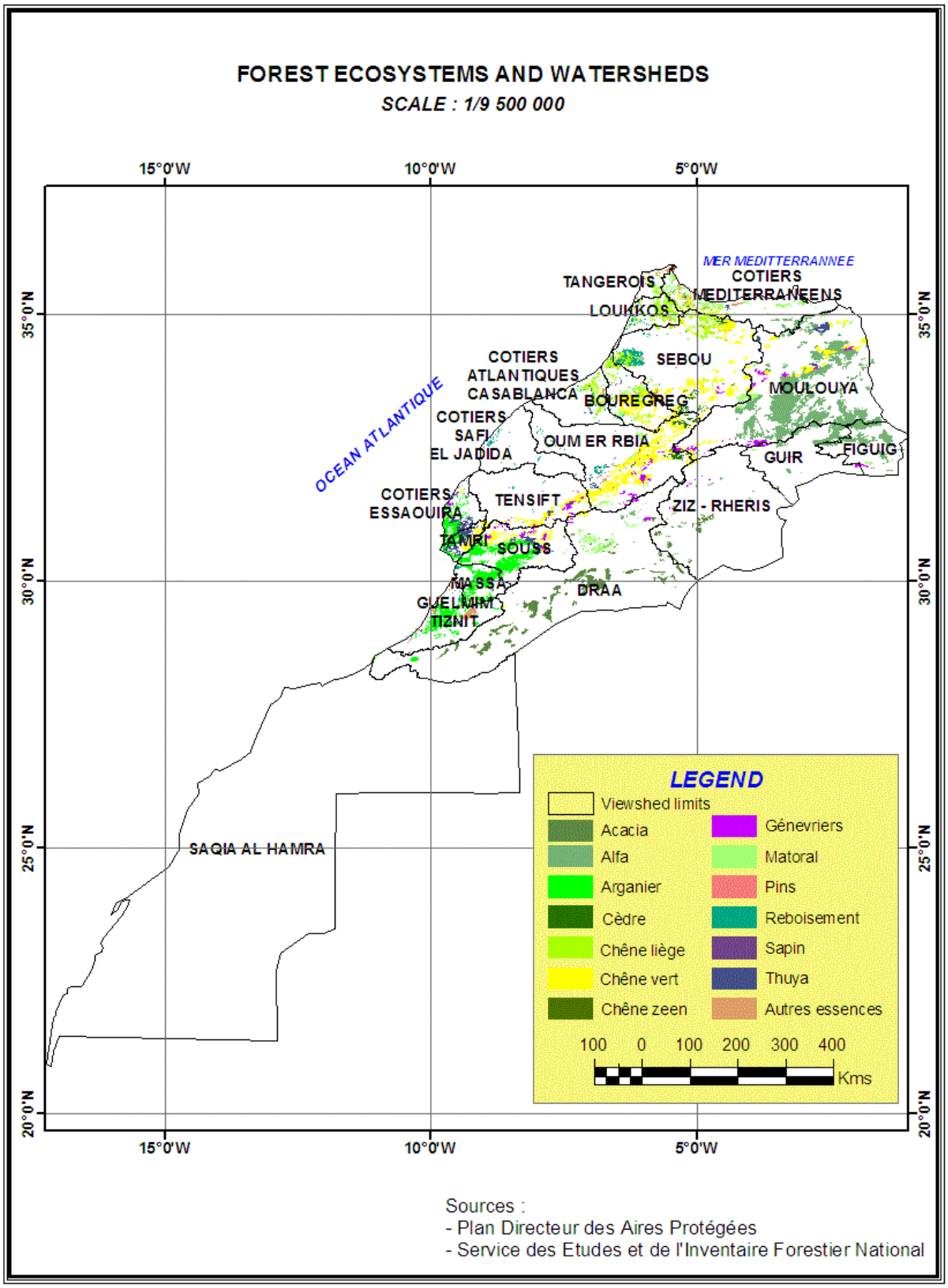
12. **POVERTY RATE (%) -- MOROCCO**

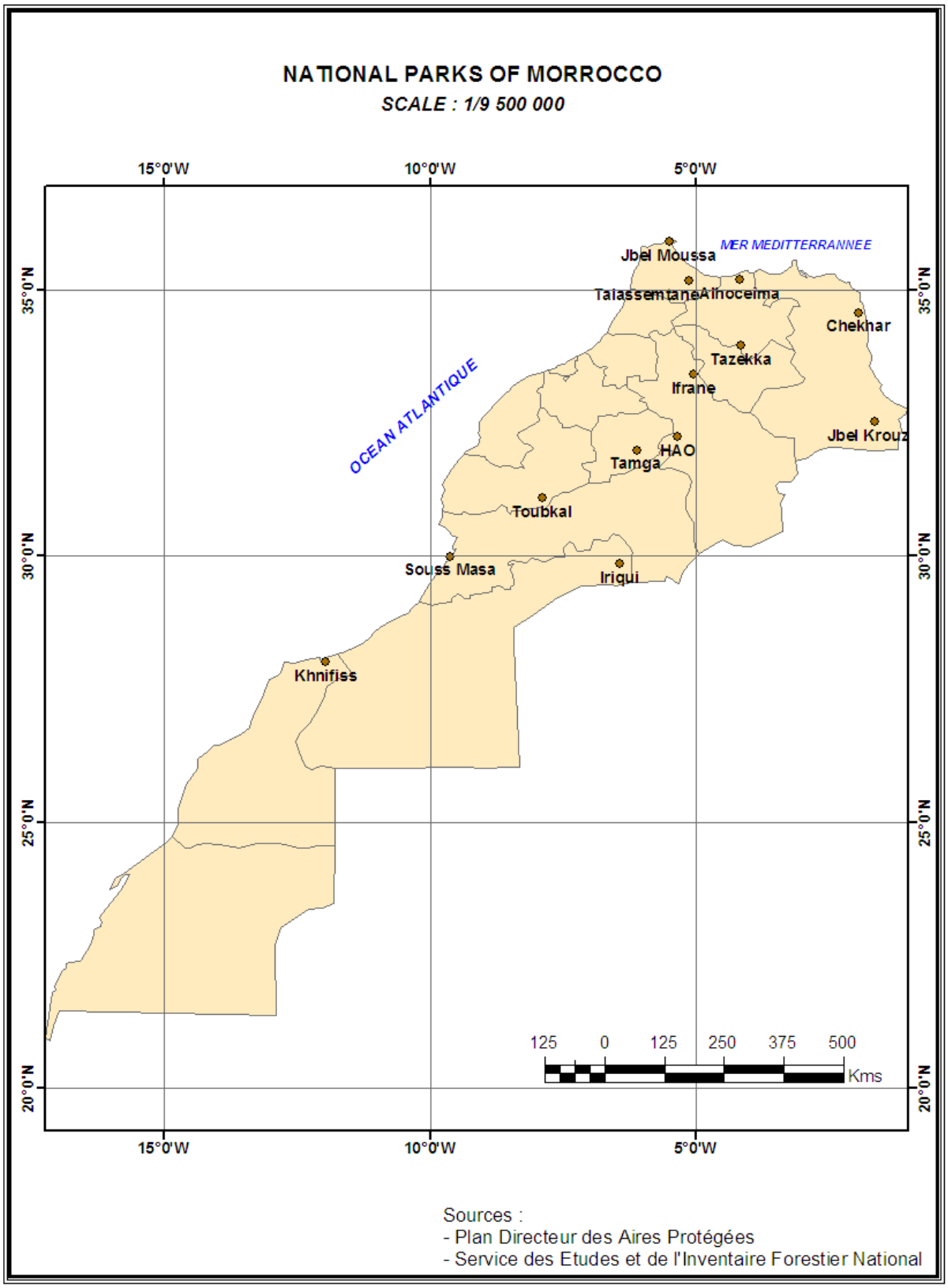


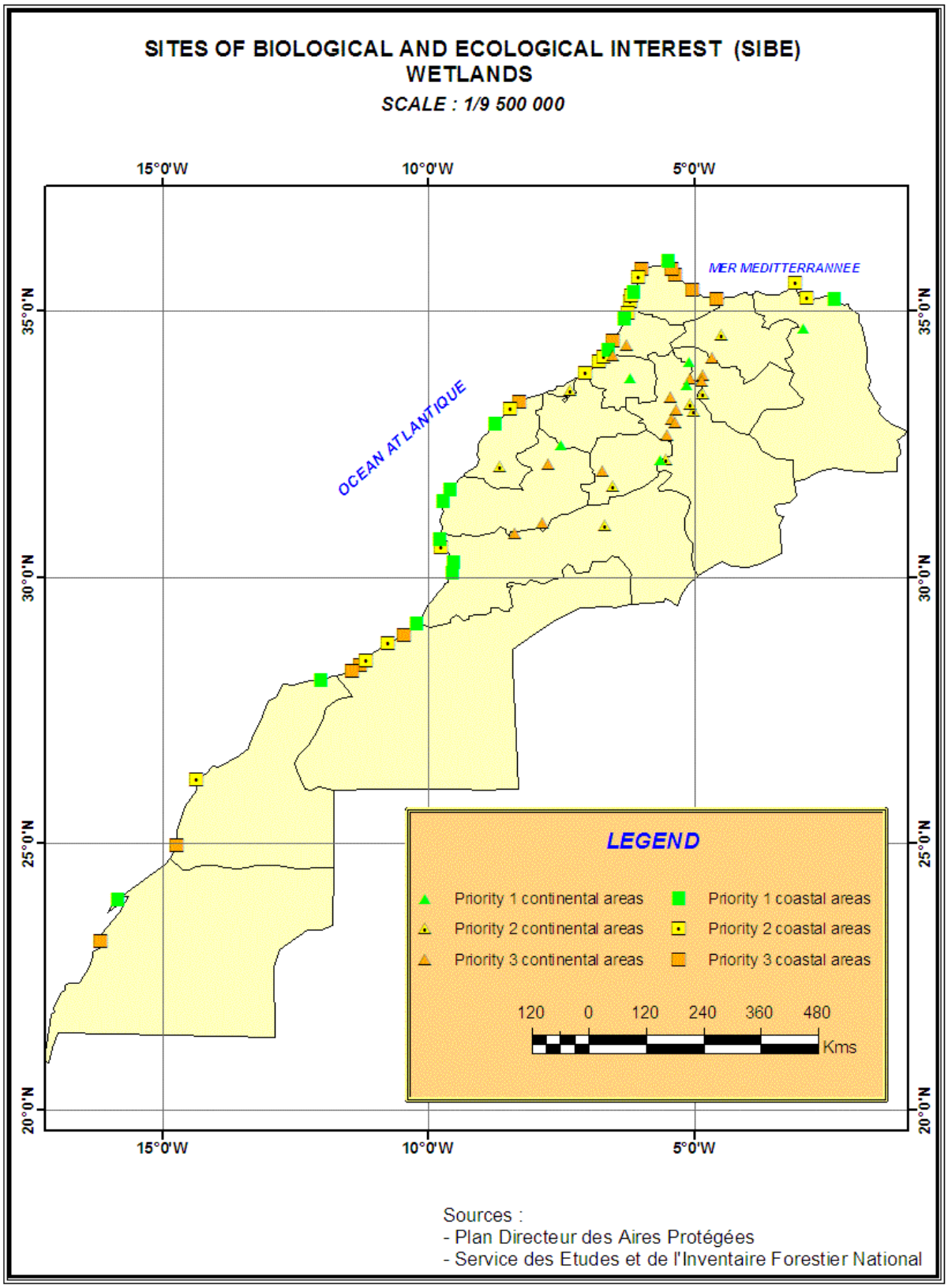
Source : Flore et écosystèmes du Maroc. Evaluation et préservation de la biodiversité par Abdelmalek BENABID. Editions Ibis Press, 2000

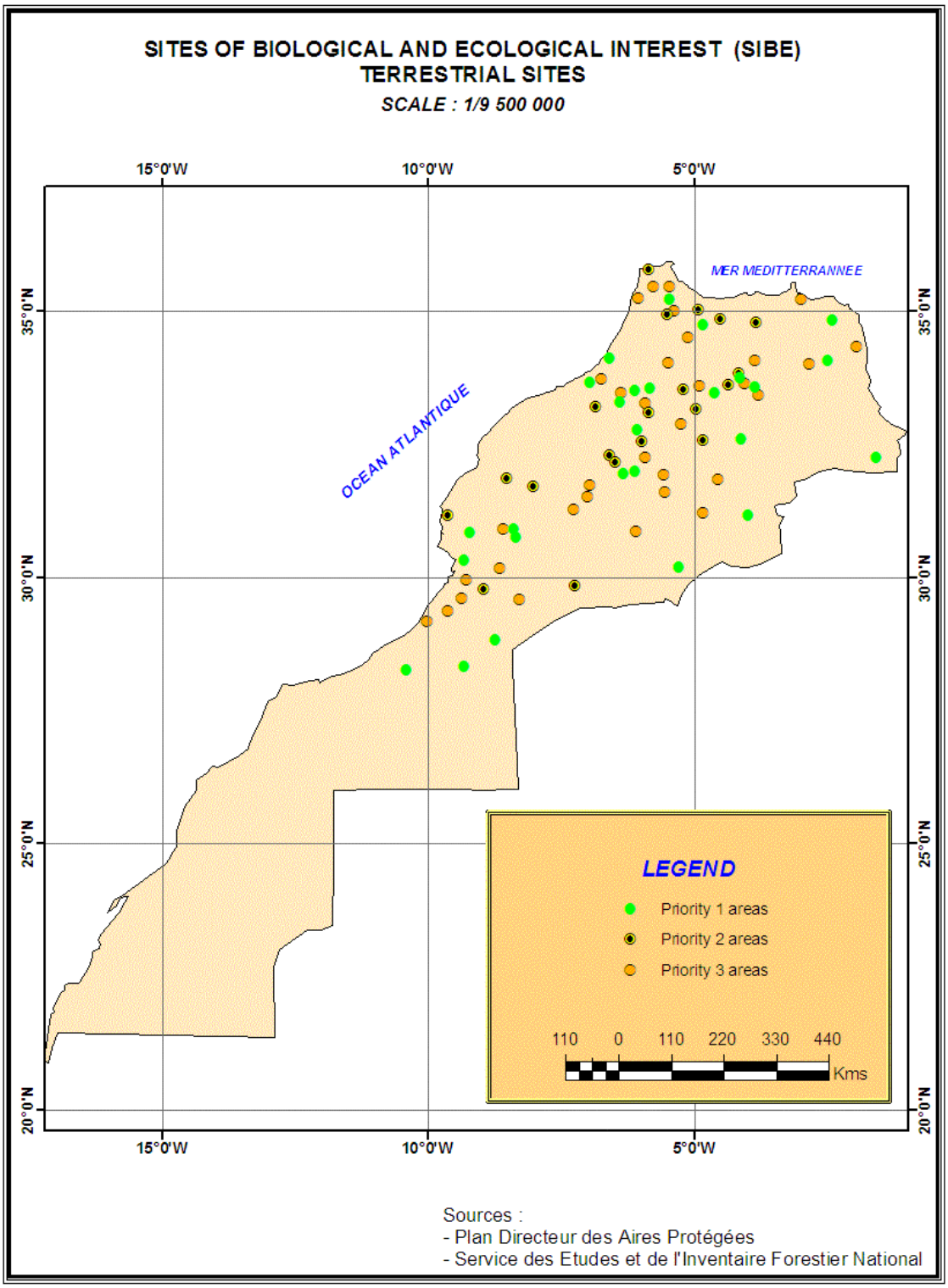


Source : Flore et écosystèmes du Maroc. Evaluation et préservation de la biodiversité par Abdelmalek BENABID. Editions Ibis Press, 2000


FOREST ECOSYSTEMS AND WATERSHEDS
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
OCEAN ATLANTIQUE
TANGEROIS
COTIERS MEDITERRANEENS
LOUKKOS
SEBOU
COTIERS ATLANTIQUES
CASABLANCA
BOUREGREG
MOULOUYA
COTIERS SAFI
EL JADIDA
OUM ER RBIA
GUIR
FIGUIG
COTIERS ESSAOUIRA
TENSIFT
ZIZ - RHERIS
TAMRI
SOUSS
MASSA
DRAA
GUELMIM
TIZNIT
SAQIA AL HAMRA
LEGEND
Viewshed limits
Acacia
Alfa
Arganier
Cèdre
Chêne liège
Chêne vert
Chêne zeen
Génevriers
Matoral
Pins
Reboisement
Sapin
Thuya
Autres essences
100 0 100 200 300 400
Kms
Sources :
- Plan Directeur des Aires Protégées
- Service des Etudes et de l'Inventaire Forestier National


NATIONAL PARKS OF MORROCCO
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
OCEAN ATLANTIQUE
Jbel Moussa
Talassemtane
Ahnoceima
Chekhar
Tazekka
Ifrane
Jbel Krouz
HAO
Tamga
Toubkal
Souss Masa
Iriqui
Khnifiss
125 0 125 250 375 500
Kms
Sources :
- Plan Directeur des Aires Protégées
- Service des Etudes et de l'Inventaire Forestier National


SITES OF BIOLOGICAL AND ECOLOGICAL INTEREST (SIBE)
WETLANDS
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
OCEAN ATLANTIQUE
LEGEND
Priority 1 continental areas
Priority 2 continental areas
Priority 3 continental areas
Priority 1 coastal areas
Priority 2 coastal areas
Priority 3 coastal areas
120 0 120 240 360 480
Kms
Sources :
- Plan Directeur des Aires Protégées
- Service des Etudes et de l'Inventaire Forestier National


SITES OF BIOLOGICAL AND ECOLOGICAL INTEREST (SIBE)
TERRESTRIAL SITES
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
OCEAN ATLANTIQUE
LEGEND
Priority 1 areas
Priority 2 areas
Priority 3 areas
110 0 110 220 330 440
Kms
Sources :
- Plan Directeur des Aires Protégées
- Service des Etudes et de l'Inventaire Forestier National

SIBES OF BIOLOGICAL AND ECOLOGICAL INTEREST
CONTINENTAL WETLANDS

Name	Priority	Code	State	Lat_DMS	Long_DMS	Lat_DD	Long_DD	Area in Hectares
Lac de Tislite	1	H34	Errachidia	32° 12' 00	05° 38' 00	32.2	-5.633333333	250
Oued Tizguit	1	H17	Ifrane	33° 34' 00	05° 05' 00	33.56666667	-5.083333333	800
Dayat er Roumi	1	H9	Khemisset	33° 45' 00	06° 12' 00	33.75	-6.2	150
Dwiyate	1	H10	Fes	34° 03' 00	05° 06' 00	34.05	-5.1	200
Barrage Mohammed V	1	H2	Taza, Berkane et Nador	34° 41' 00	02° 57' 00	34.68333333	-2.95	6500
Aguelman Sidi Ali	2	H25	Khenifra	33° 05' 00	04° 59' 00	33.08333333	-4.983333333	500
Barrage AL Massira	1	H29	Kelaa Sraghna et Settat	32° 30' 00	07° 30' 00	32.5	-7.5	14000
Barrage Mansour Ad Dahbi	2	H42	Ouarzazate	30° 58' 00	06° 41' 00	30.96666667	-6.683333333	5000
Oued Lakhdar	2	H35	Azilal	31° 42' 00	06° 32' 00	31.7	-6.533333333	10
Sebkha Zima	2	H30	Safi	32° 05' 00	08° 40' 00	32.08333333	-8.666666667	300
Lac d'Isli	2	H33	Errachidia	32° 13' 00	05° 32' 00	32.21666667	-5.533333333	400
Barrage El Maleh	2	H8	Benslimane	33° 30' 00	07° 20' 00	33.5	-7.333333333	900
Source de Tit Zill	2	H20	Boulemane	33° 20' 00	04° 53' 00	33.33333333	-4.883333333	10
Source de Bou Adel	2	H3	Taounate	34° 33' 00	04° 30' 00	34.55	-4.5	10
Aguelmam n-Tifounassine	2	H22	Ifrane	33° 09' 00	05° 06' 00	33.15	-5.1	50
Barrage Idriss premier	3	H11	Taounate	34° 07' 00	04° 40' 00	34.11666667	-4.666666667	4000
dayet Iffer	3	H14	Sefrou	33° 36' 00	04° 54' 00	33.6	-4.9	20
Dayet Ifrah	3	H18	Sefrou	33° 34' 00	04° 56' 00	33.56666667	-4.933333333	250
Plan d'eau Zerrouka I	3	H16	Ifrane	33° 33' 00	05° 05' 00	33.55	-5.083333333	10
Plan d'eau Amghass	3	H23	Ifrane	33° 23' 00	05° 27' 00	33.38333333	-5.45	10
Aguelmam Wiwane	3	H24	Ifrane	33° 08' 00	05° 21' 00	33.13333333	-5.35	30
Aguelmam Abekhane	3	H28	Khenifra	32° 40' 00	05° 31' 00	32.66666667	-5.516666667	40
Aguelmam Azegza	3	H26	Khenifra	32° 58' 00	05° 26' 00	32.96666667	-5.433333333	600
Aguelmam Mi'Ammi	3	H27	Khenifra	32° 54' 00	05° 22' 00	32.9	-5.366666667	60
Merja Bokka	3	H4	Kenitra	34° 22' 00	06° 16' 00	34.36666667	-6.266666667	10
Oued Fouarate	3	H5	Kenitra	34° 10' 00	06° 32' 00	34.16666667	-6.533333333	400
Cascades d'Ouzoud	3	H32	Azilal	32° 00' 00	06° 44' 00	32	-6.733333333	100
Sahb Al Majnoun	3	H31	Kelaat Sraghna	32° 07' 00	07° 45' 00	32.11666667	-7.75	2000
Source Tizi-n-Test	3	H41	Taroudant	34° 09' 00	04° 44' 00	34.15	-4.733333333	10

Assif N'Tifnoute	3	H40	Marrakech et Taroudant	31° 01' 00	07° 51' 00	31.01666667	-7.85	10

SIBES OF BIOLOGICAL AND ECOLOGICAL INTEREST
COASTAL WETLANDS

Name	Priority	Code	State	Lat_DMS	Long_DMS	Lat_DD	Long_DD	Area in Hectares
Archipel Essaouira	1	L26	Essaouira	31° 30' 00	9° 48' 00	31.5	-9.8	26.7
BAIE DE CINTRA	3	L40	Oued Eddahab	22° 49' 00	16° 20' 00	22.81666667	-16.33333333	10
Baie de Dakhla	1	L39	Oued Eddahab	23° 30' 00	16° 00' 00	23.5	-16	21200
BAIE DE HAOUZIA	3	L22	El jadida	33° 18' 00	8° 24' 00	33.3	-8.4	10
Bou Regreg	2	L20	Rabat	34° 00' 00	6° 49' 00	34	-6.816666667	5
Cap des 3 Fourches	2	L3	Nador	35° 26' 00	2° 59' 00	35.43333333	-2.983333333	8000
Cap Ghir	2	L28	Agadir	30° 35' 00	9° 43' 00	30.58333333	-9.716666667	4000
CAP SPARTEL	3	L10	Tanger	35° 47' 00	5° 45' 00	35.78333333	-5.75	10
Cirque d'El Jebha	3	L5	Chefchaouen	35° 12' 00	4° 39' 00	35.2	-4.65	10
Cote Rhomara	3	L6	Chefchaouen	35° 20' 00	4° 50' 00	35.33333333	-4.833333333	10
Dunes d'Essaouira	1	L25	Essaouira	31° 22' 00	9° 48' 00	31.36666667	-9.8	11000
Emb. Moulouya	1	L1	Nador et Berkane	35° 06' 00	2° 22' 00	35.1	-2.366666667	2700
Embouchure du Tamri	1	L27	Agadir	30° 43' 00	9° 51' 00	30.71666667	-9.85	900
Embouchure du Drâa	2	L32	Tantan	28° 25' 00	10° 45' 00	28.41666667	-10.75	40000
Merja Zerga	1	L16	Kenitra	34° 51' 00	6° 16' 00	34.85	-6.266666667	7000
OUED AMMA FATMA	3	L34	Laayoune	28° 13' 00	11° 46' 00	28.21666667	-11.76666667	10
Oued Cheibeka	2	L33	Tantan	28° 17' 00	11° 32' 00	28.28333333	-11.53333333	3500
OUED EL OUAR	3	L35	Laayoune	28° 12' 00	11° 52' 00	28.2	-11.86666667	10
Oued Tahadart	2	L11	Tanger	35° 34' 00	6° 00' 00	35.56666667	-6	14000
PLAGE BLANCHE	3	L31	Guelmim	28° 55' 00	10° 30' 00	28.91666667	-10.5	10
Pointe d'Awfist	2	L37	Boujdour	25° 35'00	14° 41' 00	25.58333333	-14.68333333	100
SANSOUIRE du SEBOU	3	L17	Kenitra	34° 18' 00	06° 37' 00	34.3	-6.616666667	10
Sebkha Bou Areg	2	L2	Nador	35° 10' 00	2° 45' 00	35.16666667	-2.75	14000
Sidi Bou Ghaba	1	L18	Kenitra	34° 15' 00	6° 39' 00	34.25	-6.65	800
Sidi Moussa Oualidia	1	L24	El jadida	32° 40' 00	8° 50' 00	32.66666667	-8.833333333	6000

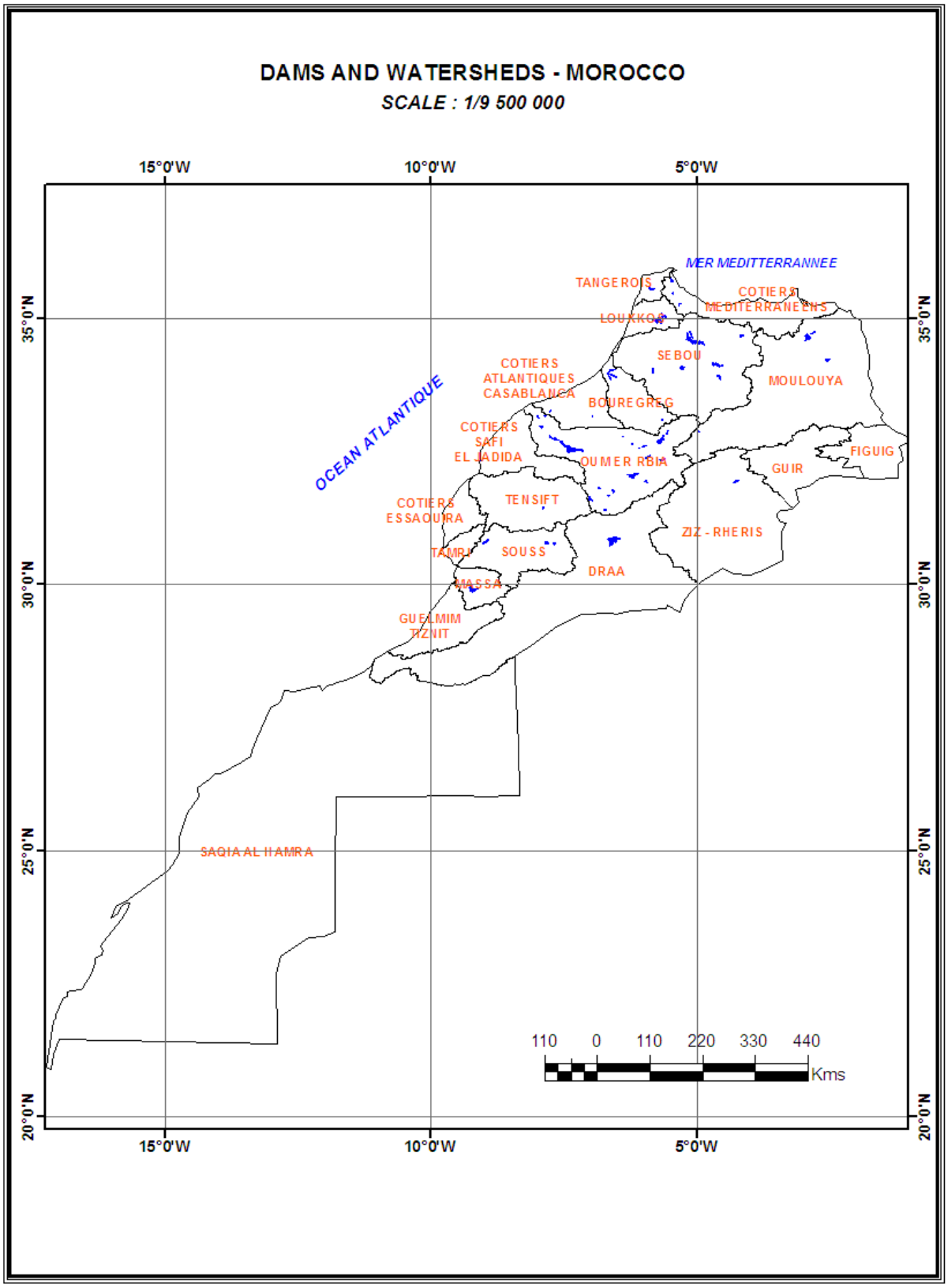
Emb. Oued Massa	3		Agadir					10
Emb. Oued Souss	3		Agadir					10

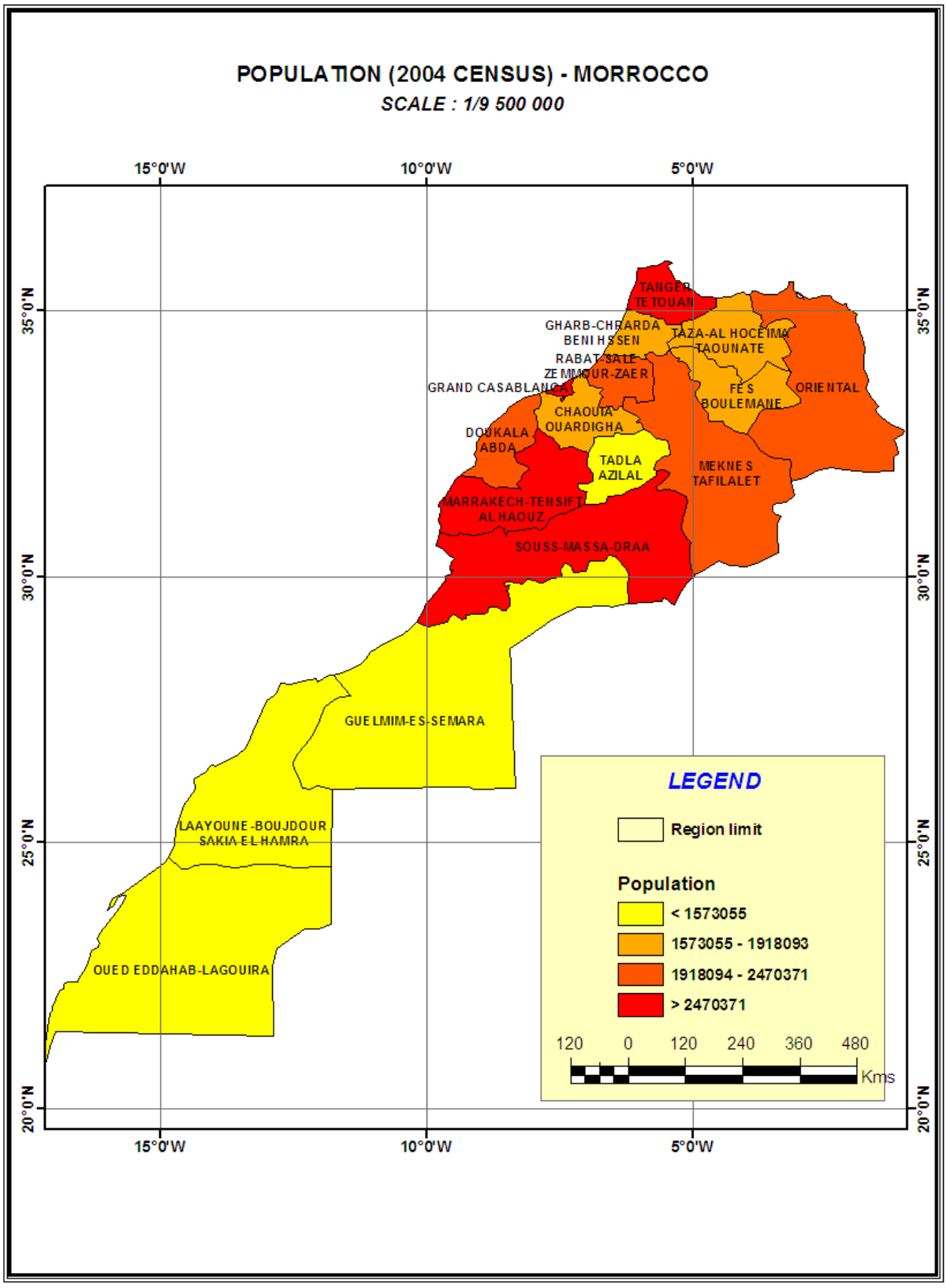
SIBES OF BIOLOGICAL AND ECOLOGICAL INTEREST
TERRESTRIAL SITES

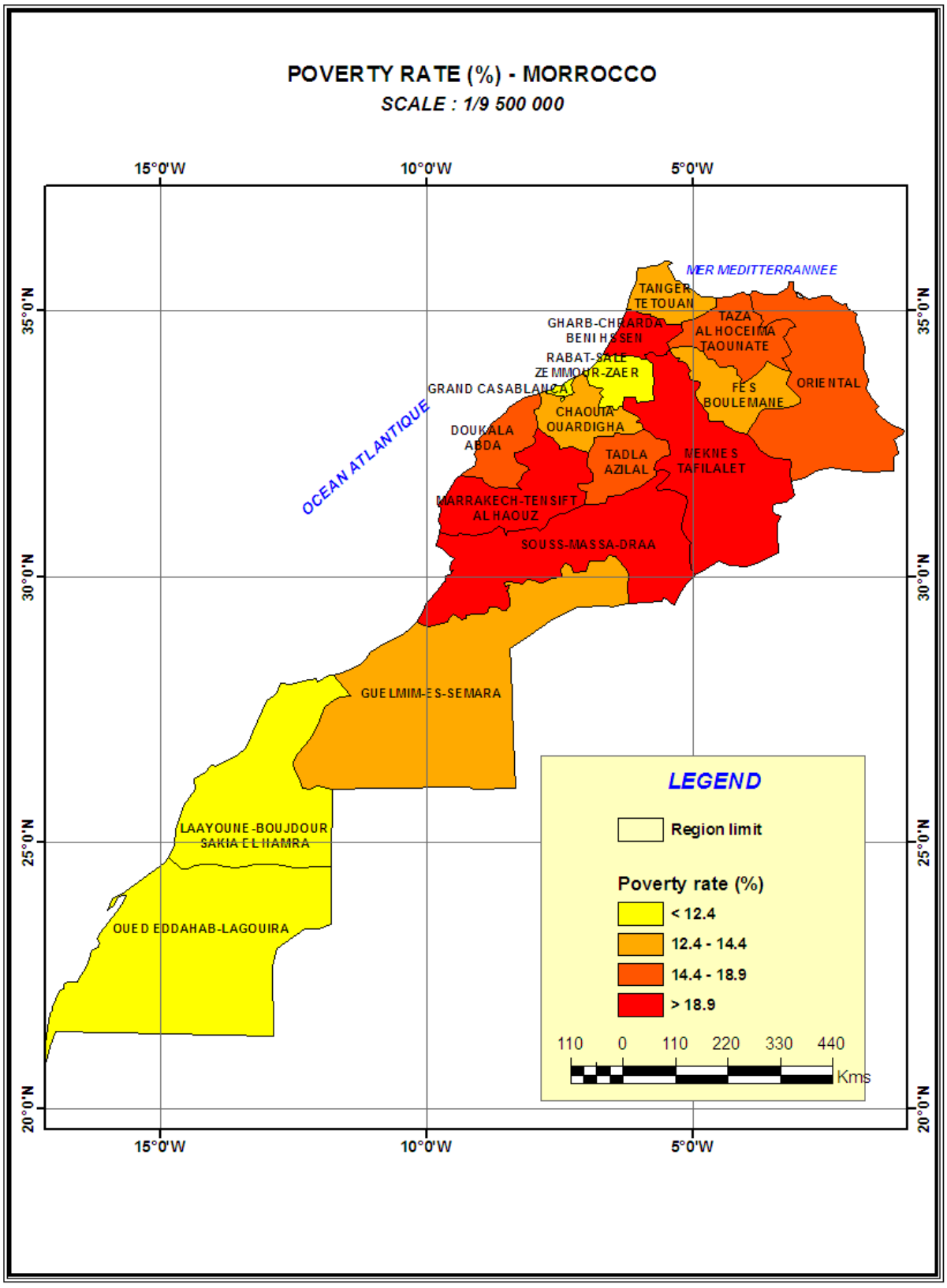
Name	Priority	Code	State	Lat_DMS	Long_DMS	Lat_DD	Long_DD	Area in Hectares
Ademine	1	58	Agadir	30° 19' 00	09° 20' 00	30.31666666670	-9.33333333333	3500
Aghbar	1	54	Marrakech	30° 55' 00	08° 24' 00	30.91666666670	-8.40000000000	6500
Ain Asmama	1	56	Marrakech, Taroudant et Agadir	30° 50' 00	09° 14' 00	30.83333333330	-9.23333333333	22000
Ait Oumribet	1	75	Tata	28° 50' 00	08° 45' 00	28.83333333330	-8.75000000000	71000
Aqqa Wabzaza	1	50	Azilal	31° 57' 00	06° 20' 00	31.95000000000	-6.33333333333	3000
Beni Snassene	1	14	Berkane	34° 50' 00	02° 24' 00	34.83333333330	-2.40000000000	6750
Beni Zemmour	1	41	Khouribga	32° 46' 00	06° 05' 00	32.76666666670	-6.08333333333	10500
Bou IBLANE I	1	20a	Sefrou et Taza	33° 45' 00	04° 09' 00	33.75000000000	-4.15000000000	12000
Bou Naceur	1	21	Taza et Boulmane	33° 35' 00	03° 52' 00	33.58333333330	-3.86666666667	14000
Bou Riah-Bedouz	1	38	Khenifra et Khemisset	33° 18' 00	06° 24' 00	33.30000000000	-6.40000000000	4000
El Harcha	1	35	Khemisset	33° 31' 00	06° 07' 00	33.51666666670	-6.11666666667	3700
Jbel Taghioult	1	45	Boulemane	32° 36' 00	04° 08' 00	32.60000000000	-4.13333333333	10000
Jbel Bouhachem	1	5	Chefchaouen et Tetouan	35° 13' 00	05° 28' 00	35.21666666670	-5.46666666667	8000
Jbel Krouz	1	69	Figuig	32° 15' 09"	01° 35' 05	32.25250000000	-1.58472222222	60000
Jbel Tichoukt	1	23	Boulmane	33° 28' 00	04° 38' 00	33.46666666670	-4.63333333333	12500
Kharrouba	1	36	Khemisset	33° 33' 00	05° 50' 00	33.55000000000	-5.83333333333	6300
Lalla Chafia	1	16	Oujda	34° 04' 00	02° 30' 00	34.06666666670	-2.50000000000	26000
Lalla Outka	1	10	Taounate	34° 45' 00	04° 50' 00	34.75000000000	-4.83333333333	4000
Mamora	1	31	Kenitra, Sale	34° 07' 00	06° 36' 00	34.11666666670	-6.60000000000	5000
Merzouga	1	70	Errachidia	31° 10' 00	04° 00' 00	31.16666666670	-4.00000000000	22700
Msseyed	1	77	Tan Tan	28° 15' 00	10° 25' 00	28.25000000000	-10.41666666670	175000
Oued Cherrat	1	33	Benslimane	33° 40' 00	06° 58' 00	33.66666666670	-6.96666666667	11300

Oued Mird	1	72	Ouarzazate	30 12' 00	05 18' 00	30.20000000000	-5.30000000000	60000
Oued Tighzer	1	76	Assa-Zag	28 19' 00	09 20' 00	28.31666666670	-9.33333333333	21000
Tafingoult	1	59	Taroudant	30 45' 00	08 22' 00	30.75000000000	-8.36666666667	3000
Tamga	1	49	Azilal	31 59' 37"	06 06' 57"	31.99361111110	-6.11583333333	8500
Aghbalou -n-Arbi	2	26	Ifrane et Boulmane	33 10' 00	04 58' 00	33.16666666670	-4.96666666667	14000
Azrou Akechar	2	12	Taza	34 48' 00	03 50' 00	34.80000000000	-3.83333333333	2000
Bou IBLANE II	2	20b	Boulemane et Taza	33 50' 00	04 10' 00	33.83333333330	-4.16666666667	2500
Brikcha	2	6	Chefchaouen	34 56' 00	05 31' 00	34.93333333330	-5.51666666667	670
Deroua	2	42	Beni Mellal	32 18' 00	06 36' 00	32.30000000000	-6.60000000000	700
El Aderj	2	19	Sefrou	33 37' 00	04 22' 00	33.61666666670	-4.36666666667	6000
Jaaba	2	25	Ifrane	33 32' 00	05 13' 00	33.53333333330	-5.21666666667	1800
Jbel Amsittene	2	57	Essaouira	31 10' 00	09 38' 00	31.16666666670	-9.63333333333	3500
Jbel Ayachi	2	46	Khenifra	32 35' 00	04 50' 00	32.58333333330	-4.83333333333	20000
Jbel Kest	2	62	Tiznit, Agadir et Taroudant	29 47' 00	08 58' 00	29.78333333330	-8.96666666667	13000
Jbel Tazerkount	2	29	Azilal	32 10' 00	06 30' 00	32.16666666670	-6.50000000000	15000
Jbel Tizirane	2	38	Chefchaouen	35 02' 00	04 56' 00	35.03333333330	-4.93333333333	1100
Khatouat	2	39	Settat, Khouribga	33 13' 00	06 52' 00	33.21666666670	-6.86666666667	5000
Koudiat Tidighine	2	9	Al Hoceima	34 51' 00	04 31' 00	34.85000000000	-4.51666666667	4000
Marais de la Palmeraie Marrakech	2	43	Marrakech	31 42' 00	08 02' 00	31.70000000000	-8.03333333333	250
M'Sabih Talaa	2	44	Safi	31 54' 00	08 35' 47	0.00000000000	0.00000000000	1987
Oasis de Tissint	2		Tata	29 50' 00	07 15' 00	29.83333333330	-7.25000000000	31000
Ouardane	2	40	Khenifra	33 06' 00	05 51' 00	33.10000000000	-5.85000000000	3000
Perdicaris	2	1	Tanger	35 47' 00	05 52' 00	35.78333333330	-5.86666666667	70
Tizi-n-Ait Ouirra	2	28	Beni Mellal	32 33' 00	05 59' 00	32.55000000000	-5.98333333333	0
Ait Er Kha	3	64	Tiznit	29 22' 00	09 38' 00	29.36666666670	-9.63333333333	4000
Anezi	3	63	Tiznit	29 36' 00	09 23' 00	29.60000000000	-9.38333333333	10
Assads	3	60	Taroudant	30 10' 00	08 40' 00	30.16666666670	-8.66666666667	10
Ben Karrich	3	2	Tetouan	35 28' 00	05 28' 00	35.46666666670	-5.46666666667	22100
Bou Tferda	3	48	Beni Mellal	32 15' 00	05 55' 00	32.25000000000	-5.91666666667	10
Bou Timesguida	3	65	Tiznit	29 10' 00	10 01' 00	29.16666666670	-10.01666666670	10
Bouzemmour	3	20c	Taza	33 38' 00	04 03' 00	33.63333333330	-4.05000000000	10
Chekhar	3	15	Oujda	34 20' 06	01 57' 14	34.33500000000	-1.95388888889	10000
Dar Lahoussine	3	61	Agadir	29 57' 00	09 18' 00	29.95000000000	-9.30000000000	1000

El Kheng	3	68	Errachidia	31 51' 00	04 33' 00	31.85000000000	-4.55000000000	4000
Grotte d'Akhyam	3	47	Ouarzazate	31 55' 00	05 35' 00	31.91666666670	-5.58333333333	10
Imaoun	3	74	Tata	29 35' 00	08 18' 00	29.58333333330	-8.30000000000	10
Imi-n-ifri	3	51	Azilal	31 44' 00	06 58' 00	31.73333333330	-6.96666666667	10
Jbel Amergou	3	11	Fes	34 30' 00	05 08' 00	34.50000000000	-5.13333333333	10
Jbel Gourougou	3	13	Nador	35 13' 00	03 00' 00	35.21666666670	-3.00000000000	10
Jbel Haabib	3	3	Tetouan	35 28' 00	05 46' 00	35.46666666670	-5.76666666667	5000
Jbel Ouarirt	3	18	Taza	34 05' 00	03 52' 00	34.08333333330	-3.86666666667	10
Jbel Sargho	3	66	Ouarzazate	30 51' 23"	06 06' 28"	30.85638888890	-6.10777777778	10
Jbel Zerhoun	3	30	Meknes	34 02' 00	05 30' 00	34.03333333330	-5.50000000000	2000
Khemis Es Sahel	3	4	Larache	35 15' 00	06 03' 00	35.25000000000	-6.05000000000	1000
Korifla	3	32	Sale et Khemisset	33 43' 00	06 45' 00	33.71666666670	-6.75000000000	2000
Lalla Mimouna	3	17	Oujda	34 01' 00	02 51' 00	34.01666666670	-2.85000000000	800
Ment	3	37	Khemisset	33 16' 00	05 56' 00	33.26666666670	-5.93333333333	10
Msissi	3	71	Errachidia	31 12' 00	04 51' 00	31.20000000000	-4.85000000000	10
Oued Todra	3	67	Ouarzazate	31 36' 00	05 34' 00	31.60000000000	-5.56666666667	10
Outat El Haj	3	22	Boulmane	33 26' 00	03 48' 00	33.43333333330	-3.80000000000	10000
Sidi Meskour	3	52	Azilal	31 31' 00	07 01' 00	31.51666666670	-7.01666666667	10
Souk el had	3	7	Chefchaouen	35 01' 00	05 23' 00	35.01666666670	-5.38333333333	343
Takeltount	3	24	Sefrou	33 36' 00	04 54' 00	33.60000000000	-4.90000000000	10
Talarhine	3	27	KHENIFRA	32 53' 00	05 15' 00	32.88333333330	-5.25000000000	300
Tichka	3	55	Marrakech	30 54' 00	08 36' 00	30.90000000000	-8.60000000000	10
Tsili	3	34	Khemisset	33 28' 00	06 23' 00	33.46666666670	-6.38333333333	1000
Vallee de Telouat	3	53	Ouarzazate	31 17' 00	07 16' 00	31.28333333330	-7.26666666667	10


DAMS AND WATERSHEDS - MOROCCO
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
TANGEROIS
COTIERS MEDITERRANEENS
LOUKKOS
SEBOU
MOULOUYA
COTIERS ATLANTIQUES CASABLANCA
BOUREGREG
OCEAN ATLANTIQUE
COTIERS SAFI EL JADIDA
OUMER RBIA
FIGUIG
GUIR
COTIERS ESSAOUIRA
TENSIFT
ZIZ - RHERIS
TAMRI
SOUSS
DRAA
MASSA
GUELMIM TIZNIT
SAQIA AL HAMRA
110 0 110 220 330 440
Kms


POPULATION (2004 CENSUS) - MORROCCO
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
TANGER TETOUAN
GHARB-CHRARDA BENI HSSEN
TAZA-AL HOCEIMA TAOUNATE
RABAT-SALE ZEMMOUR-ZAER
GRAND CASABLANCA
FES BOULEMANE
ORIENTAL
CHAOUIA OURDIGHA
DOUKALA ABDA
TADLA AZILAL
MEKNES TAFILALET
MARRAKECH-TENSIFT AL HAOUZ
SOUSS-MASSA-DRAA
GUELMIM-ES-SEMARA
LAAYOUNE-BOUJDOUR SAKIA EL HAMRA
OUED EDDAHAB-LAGOUIRA
LEGEND
Region limit
Population
< 1573055
1573055 - 1918093
1918094 - 2470371
> 2470371
120 0 120 240 360 480
Kms


POVERTY RATE (%) - MORROCCO
SCALE : 1/9 500 000
15°0'W
10°0'W
5°0'W
35°0'N
30°0'N
25°0'N
20°0'N
MER MEDITTERRANNEE
OCEAN ATLANTIQUE
TANGER TETOUAN
TAZA AL HOCEIMA TAOUNATE
GHARB-CHRARDA BENI HSSEN
RABAT-SALE ZEMMOUR-ZAER
GRAND CASABLANCA
FES BOULEMANE
ORIENTAL
CHAOUIA OURDIGHA
DOUKALA ABDA
TADLA AZILAL
MEKNES TAFILALET
MARRAKECH-TENSIFT AL HAOUZ
SOUSS-MASSA-DRAA
GUELMIM-ES-SEMARA
LAAYOUNE-BOUJDOUR SAKIA EL HAMRA
OUED EDDAHAB-LAGOUIRA
LEGEND
Region limit
Poverty rate (%)
< 12.4
12.4 - 14.4
14.4 - 18.9
> 18.9
110 0 110 220 330 440
Kms

Annex H: Table of Protected Areas

Full List of Morocco's National Parks Source: HCEFLCD

N°.	Name	Creation Date	Area (Ha)	Location, Provinces	Main Characteristics	Staff in Place	Mngt Plan	Eco-Soc. Values
1	Toubkal	1942	38,000	Al Houz, Taroudant et Ouarzarat	Mountainous NP	Director+2 staff assisted by local forest service	Yes	Highest Mountain in Africa. High Ecotourism potentiality values
2	Tazekka	1950 extended in 2004	13,737	Taza		Director+2 staff assisted by local forest service	Yes	Very high values. Friouatou Grotto and Mjbar groove visited by 1000 of national and international visitors/year. Ecotourism potentialities.
3	Souss Massa	1991	33,800	Chtouka, Ait Baha and Tiznit		Director+3 staff.	Yes	High value. National and international visitors and scientists. Ecotourism potentialities
4	Iriqui	1994	123,000	Ouarzazate and Tata	Presence of wet and desert zones	Director assisted by local forest service	Yes	High value. Ecotourism potentialities
5	Al Hoceima	2004	48,460	Al Hoceima	19,000 ha of marine	Director assisted by local forest service	Draft Plan	Very high values. Presence of about 12,000 users and association of traditional fishers

6	Talassemtane	2004	58,950	Chefchaouen		Director assisted by local forest service	Simplified Plan	High value. Ancestral traditions (*moussems*)
7	Ifrane	2004 extended in 2008	124,850	Ifrane		Director assisted by local forest service	Simplified Plan	Very high. Different Berber tribes with different cultures. Ecotourism potentialities.
8	Eastern High Atlas	2004	55,252	Errachidia and Khénifra		Director 2 staff assisted by local forest service	Simplified Plan	Very High values. Different Berber cultures. Ecotourism potentialities.
9	Khénifra	2008	93,500	Khénifra		No, recently created	No, recently created	Very high values. Local traditions: folklore , craftsmen. Ecotourism potentialities
10	Khnifiss	2006	185,000	Laâyoune	RAMSAR site since 1980	Director assisted by local forest service	Simplified Plan	Very High values. Terrestrial, marines, lagoons sceneries. Ecotourism potentialities

Annex I: Conservation Status of Terrestrial Ecosystems

Major Ecosystems	Dominant Species	Main species (including understory)	Conservation Status
1. Forest Ecosystems	**Cedar** *Cedrus atlantica*	*Quercus rotundifolia, Q. faginea, Juniperus thrufiera, Ilex aquifolium, Cytisus battandieri, Cistus laurifolius, Daphne laureola, Crataegus laciniata, Ribess uva-cripa, Berberis hispanica, bupleurum spinosum..*	Moderate to degraded
	Pines*:* *Pinus halepensis*, *Pinus pinaste*, *Pinus nigra*	*Tetraclinis articulata, Juniperus phoenicea, Quercus rotundifolia, Pistacia lentiscus, Phillyirea spp., Rosmarinus officinalis, Rosmarinus tournefortii, Stipa tenacissima, Globularia alypum, Cistus spp...*	Moderate
	Tetraclinis *Tetraclinis articulata*	*Juniperus phoenicea, Pinus halepensis, Ceratonia siliqua, Argania spinosa, Quercus rotundifolia, Pistacia lentiscus, Pistacia atlantica, Phillyrea latifolia.*	Moderate
	Oxycedrus *Juniperus oxycedrus*	*Quercus rotundifolia*, *Juniperus phoenicea, Teraclinis articulate, (Abies pinsapo maroccana).*	Degraded
	Red Juniper *Juniperus phoenicea*	*Tetraclinis articulata*, Green Oak, or *Pinus pinaste…*	Degraded
	Oxycedrus *Juniperus oxycedrus*	*Quercus rotundifolia, Juniperus phoenicea*, *Teraclinis articulate*, *Abies pinsapo maroccana…*	Degraded
	Red juniper *Juniperus phoenicea*	*Tetraclinis articulata*, Green Oak, *Pinus halepensis…*	Moderate
	Firs *Abies pinsapo maroccana*	*Cedar, Oak, and Pines*	Moderate
	Atlas Cypress *Cupressurs atlantica*	*Red Junipers, Oxycedar Juniper, Barbery Thuya or green Oak*	Moderate
	Holm Oak *Quercus rotundifolia*	*Quercus suber, Quercus faginea, Pine, Cedar, red Juniper and to a lesser degree the Barbary Thuya, Viburnum tinus, Arbutus unedo, Pistacia lentiscus, Ruscus aculeatus, Daphne laureola, Ilex aquifolium, Hedera helix, Lonicera spp., Cistus spp., etc...*	Moderate with absence of natural regeneration
	Cork Oak *Quercus suber*	*Quercus rotundifolia, zeen oak, Cytisus linifolius, Thymelaea lythroides, Erica arborea, Erica scoparia, Cistus monspeliensis, Myrtus communis, Pteridium aquilinum...*	Degraded with absence of natural regeneration
	Coccifers *Quercus coccifera*	*Tetraclinis articulata*, *Quercus rotundifolia….*	Moderate
	Oleasters (wild olive) *Olea europaea.*	*Lentisk, Phillarres, Tizra, Tetraclinis articulate, Holm and Cork oaks.*	Moderate
	Ceratonia (Carob) *Ceratonia siliqua*	*Tetraclinis articulate.*	Moderate
	Pistachia (Atlas	*Tetraclinis articulate.*	Moderate

Major Ecosystems	Dominant Species	Main species (including understory)	Conservation Status
	pistachio) *Pistacia atlantica*		
	Argania (argon) *Argania spinosa*	*Periploca laevigata, Senecio anteuphorbium, Launaea arborescens, Warionia saharae, Acacia gummifera, Rhus tripartitum, Withania frutescens, Euphorbia officinarum,* subsp. *beaumierana* and subsp. *echinus, Cytisus albidus, Ephedra altissima, Teraclinis aticulata…*	Moderate. Natural regeneration difficult.
2. Steppe Ecosystems	**Steppes** *Stipa tenacissima Artemisia* spp. with spiny xerophytes	*Arenaria pungens, Artemisia inculta (= A. herba alba), Bupleurum spinosum, Cytisus balansae, Alyssum spinosum, Erynacea anthyllis and Ononis atlantica.*	Moderate to degraded
3. Saharan ecosystems	*Acacia raddiana, Acacia ehrenbergiana*	*Balanites aegyptiaca, Maerua crassifolia and Rhus tripartitum*	Degraded

Note: This table has been translated, with permission from the author, from Flore et écosystèmes du Maroc. Evaluation et préservation de la biodiversité par Abdelmalek BENABID. Editions Ibis Press, 2000.

Annex J: National Plans, Strategies and Legislation

The following national plans and strategies are related to biodiversity and forest conservation. Web links are provide for most of them:

1. National Action Plan to Combat Desertification 1999
2. National Forestry Program (Programme Forestier National). 1998
3. National Program to Combat Desertification (Programme d'Action National de Lutte contre la Désertification. 1999
4. National Strategy for the Conservation and Sustainable Use of Biodiversity (Stratégie Nationale de la Conservation et de l'Utilisation Durable de la Biodiversité). 2001
5. National Protected Areas Strategy (Stratégie Nationale des Aires Protégées). 1994
6. Watershed Management Strategy (Stratégie d'Aménagement des Bassins Versants) 1995
7. Strategy for the Conservation and Economic Development of Genetic Resources in Morocco (Stratégie de Conservation et de Valorisation des Ressources Génétiques des Plantes au Maroc)
8. Environmental Protection and Sustainable Development Strategy (Stratégie de Protection de l'Environnement et du Développement Durable)
9. Forest Development Strategy (Stratégie du Développement Forestier) . 1999
10. Reforestation Master Plan (Plan Directeur de Reboisement) 1998

Forest Laws and Regulations

1. Dahirs du 10/10/1917
2. Dahirs du 04/03/1925
3. Dahir réglementant l'exploitation des carrières - 1914
4. Dahir sur la délimitation du domaine de l'Etat - 1916
5. Dahir relatif aux occupations temporaires du domaine public - 1918
6. Dahir sur la pêche dans les eaux continentales - 1922
7. Dahir sur la police de la chasse - 1923
8. Dahir sur la protection de la délimitation des forêts d'arganier - 1925

9. Dahir sur la conservation et l'exploitation des peuplements d'alfa - 1930
10. Dahir sur la création de parcs nationaux - 1934
11. Dahir réglementant le commerce du gibier - 1938
12. Dahir créant un conseil supérieur de la chasse et un fonds de la chasse - 1950
13. Dahir relatif à l'organisation de la participation des populations au développement de l'économie forestière - 1976

Major Conventions and Ratification Date

CONVENTION	RATIFICATION DATE
CITES	1975
RAMSAR	1980
De BONN/CMS	1993
De BERNE	2001
UNCCD	1996

Annex K: Linkages between Water and Biodiversity/Forest Conservation

General Context

The 118/119 Assessment Team is aware that USAID, and many other stakeholders, are very concerned about the problem of growing water shortages in Morocco. The Preliminary Report of the Assessment Team paid relatively little attention to the water sector. Indeed, when one looks at the guidance for the development of 118/119 Assessments, water is not a factor to be directly targeted by these assessments.

There are linkages, however, between water and biodiversity/forest conservation. They are mostly found in the area of watershed management. This paper attempts to analyze and to explore these linkages.

Watershed Management

The management of watershed affects the following water parameters:

- The quantity of water coming off the watershed;
- The quality of water coming of the watershed;
- The timing of water coming off the watershed
- The groundwater dynamics of the watershed

Watersheds in Morocco are dominated by the following land use/land cover types;

- Agricultural crop land – annual crops and tree crops. Nearly all agricultural lands are used for gazing during some portion of the year.
- Natural forests composed of forest and shrub cover – all used for grazing and much of them used for the production of wood and other forest products;
- Steppes/grasslands/grazing lands – all used for grazing;
- Small areas of forest plantations

Linkages between watershed management and forest/biodiversity conservation

Watershed management of natural forests on watersheds is directly linked to the conservation of forests and their biodiversity. Watershed management of grazing lands in watersheds is directly linked to the conservation of the biodiversity of the grazing lands. Improved soil and water conservation on agricultural lands in watersheds has relatively weak and mostly indirect linkages with biodiversity and forest conservation.

Impact of vegetation cover on watersheds For non-agricultural lands in a watershed, it is the vegetation cover that is the most critical factor to the health and the management of the watershed. Good vegetation cover will generally have the following impacts:

- More infiltration
- Less volume and velocity of runoff
- Increased evapotranspiration
- Reduced erosion
- Reduced flooding during the rainy season and increased stream flow in the dry season

- Increased life of dams/reservoirs – because of decreased erosion and sedimentation
- Cleaner water (less sediment load)
- Heightened water table and increased ground water
- Increase in the number and the output of springs
- Total runoff over the course of the year may be decreased. A higher portion of rainfall received may be lost to evapotranspiration. Badly degraded watersheds with poor vegetation cover may have very high runoff rates that may increase total water outputs from the watershed.
- Less sediment deposition in streams, lakes, wetlands and marine areas.

You don't have to have forest cover to achieve these positive watershed impacts. A dense cover of grasses can be very efficient in controlling erosion and in increasing the infiltration of rainwater and will not lose as much water to evapotranspiration. Likewise, one can have high runoff rates and high erosion rates in a forest that has good tree cover but that has lost its herbaceous cover and/or litter layer or has severely eroded and degraded soils. A good litter layer can also hold the soil together and facilitate high infiltration rates.

Agricultural lands on watersheds

Agriculture in hilly to mountainous watersheds is very commonly a major cause of watershed degradation. The cultivation of annual crops like wheat is much more problematic than the cultivation of perennial crops like fruit and nut trees. It exposes the soil and greatly increases its susceptibility to erosion. The steeper the slopes the greater the erosion. Some soils are more susceptible than others and the silty soils of parts of the Rif are some of the most susceptible to increased erosion.

A wide variety of soil and water conservation techniques have been developed to reduce soil and water losses from sloping agricultural lands. They include terraces, contour strips of vegetation (especially grasses and shrubs), the use of green manure cover crops, agro-forestry practices, rock walls, etc. Some of them lend themselves to mechanization – especially on more gentle slopes. Many of them are very labor intensive and many require constant maintenance.

Impact of overgrazing on watersheds

The most important factor causing the degradation of non-agricultural lands on watersheds is almost certainly overgrazing. Overgrazing typically has the following impacts:

- Decreased herbaceous cover. More exposed bare soil subject to erosion and higher runoff rates/lowered infiltration rates.
- Decreased litter layer as compared to forest cover or even grasslands not subject to grazing;
- Soil compaction and consequent lowered infiltration rates;
- Decreased cover of perennial grasses versus that of annual grasses.
- On sites that are marginal forest sites, the decrease in infiltration and groundwater can sometimes lead to outright mortality of the tree cover, or, in combination with soil compaction, prevent forest regeneration;
- Overgrazing typically leads to decreased natural regeneration of trees and shrubs. Some species, e.g. Atlas cedar, are much more susceptible to overgrazing than other, so overgrazing can lead to major changes in forest species composition over time. In severe cases, overgrazing can eliminate nearly all natural regeneration of trees, e.g. cork oak forests in the Mamora.

Impacts of climate change on watersheds

The Forest Research Center told the team that climate change is occurring in Morocco and is characterized by the following parameters:

- Increased temperatures
- Decreased rainfall.

Global warming is not always accompanied by decreased rainfall. The two together make for a "double whammy" that may prove very serious for Morocco. Decreased rainfall by itself leads to decreased runoff, decreased groundwater and changes to ecosystems and vegetation cover. But the increase in temperatures causes increases in evapotranspiration that also contribute to decreased runoff, decreased groundwater and changes to ecosystems and vegetation cover.

If it has not already been done, it would be most valuable to attempt to model the impact of increasing temperatures and decreasing rainfall on watershed output and water availability for Morocco.

Linkages between watershed management and biodiversity/forest conservation

The Assessment Team sees little linkage between the improved management of agricultural lands on watershed and biodiversity/forest conservation. Likewise, the establishment of forest plantations on watersheds generally has little linkage with the conservation of natural forests and biodiversity.

The clear linkages between improved watershed management and forest/biodiversity conservation are found in improved management/conservation of forest and grazing lands on the watershed. And the main "manageable" pressure in both cases is overgrazing. (Climate change/global warming is not manageable at the level of Morocco – only at the planetary level.)

Watershed management experience in Morocco

Morocco has a long experience in watershed management initiatives. As far as the Assessment Team has been able to determine to date, all of the past and current initiatives have involved work on agricultural lands within watersheds or on reforestation within watersheds. We have been told that there have been no watershed management initiatives involving improved management of grazing lands and natural forests.

Challenges and opportunities – or good news/bad news!

The good news is that both watershed degradation of forest and rangelands and loss of biodiversity on forests and rangelands have common causes. They also have common solutions.

The bad news is that the main "manageable" cause of their degradation is overgrazing – one of the most difficult problems to resolve. Most strategies for improved management would involve working directly or indirectly with HCEFLD – not always an easy partner to work with.

Annex L: Women's Clam Cooperative at Oualidia

The Women's Clam Cooperative at Oualidia is of great interest because it is the only case identified by the Assessment Team where local resource users have been granted exclusive rights for the management and harvest of coastal marine resources – in this case for clams. This short-lived experiment was working very well until it came to a premature end because of the growing problem of pollution in the Oualidia Lagoon.

The lagoon of Oualidia is situated to the south of El Jadida, a protected salt water ecosystem several kilometers long with only one opening to the sea. It is a habitat that is especially well-known for its oysters that are now primarily produced through aquaculture and that are primarily produced for the export market, especially at Christmas time.

The marine resources of Oualidia Lagoon have traditionally been harvested as open access resources by local populations. Open access to the protected, calm waters of the lagoon combined with rapid growth of Oualidia and surrounding populations and the rapidly developing export market resulted in severe over-harvesting of the lagoon's resources by the late 1990s. This then led to an initiative led by an NGO (FEDER -Woman and Farming Development) in collaboration with the local fisheries department (sous-délégation de la pêche) to confront the serious depletion of the lagoon's resources. This led to the creation of a women's cooperative composed of women who traditionally exploited clams in the lagoon and the granting of exclusive rights of a portion of the lagoon to the cooperative. Stages cleared by this cooperative.

The key steps in the development of this initiative are outlined below:

- The women were organized into a cooperative named the Oualidia Women's Cooperative for the Exploitation of Clams;
- The development of by-laws and legal registration of the cooperative;
- The negotiation and signing of a lease for two hectares of the lagoon. The Women's Cooperative leased the two hectares from the "Domaines Maritimes" in the Ministry of Equipment. This is the government agency that controls the coast and shallow waters down to a depth of six meters. The cooperative pays a yearly rent for the lease of the two hectares.
- The recruiting of a consultant to advise and train the women on the technical aspects of clam management and low-intensity aquaculture for clams.

Key aspects of the management of the resource:

- The management consists primarily of protection and enrichment. Management techniques were quite simple and easily mastered by the women in the cooperative.
- The two hectares is treated like a protected reserve for the clam. No harvesting of clams is done during the entire year except at the point when the market prices reach their annual peak. The Women's Coop hired a guard to protect the two hectares from unauthorized use.
- The women enriched their two hectares with tiny immature clams called spits. Initially, they collected spits from elsewhere in the lagoon. Later, they purchased spits from the MAROST company in Nador;
- Two techniques for enrichment were used. The spits were either released directly onto the muddy silt bottom without any protection or they were dispersed on the bottom and protected by nets to protect them from predation.

- Harvest takes place in December when prices in the European market normally reach their peak. Only the large clams of proper commercial size are harvested. The smaller are left to mature for the next year's harvest.

An early and premature end to this initiative

- The lagoon is surrounded by the rapidly growing small urban center of Oualidia, small towns or *douars* and agricultural lands that come right down to the edge of the lagoon.
- Oualidia does not have a city sewer system. First fecal bacteria have built up in the lagoon and then salmonella was detected.
- With the detection of salmonella, the export of the clams is forbidden
- These are external factors, out of the control of the cooperative, which put an end to the experience.

Positive aspects of this experience

Lessons learned and the positive aspects of this experience include::

- The cooperative was composed of a traditional users group. The women that made up the cooperative were the same women who traditionally harvested the resources of the lagoon.
- The cooperative gave the women the legal status needed for leasing and for dealing with the Fisheries Department and financial and technical backers.
- The cooperative was empowered with exclusive rights over their two hectares. This is perhaps the most critical element of the entire initiative because it put an end to the prevailing open access to marine resources. Under open access, no management is possible.
- Financial incentive - the clam is an exported product that sells at a very attractive price. The members of the cooperative profited from the management of their two hectares of lagoon. They had a strong financial incentive to respect their contractual obligations and to protect their resource.
- The initiative was highly promising in terms of ecological sustainability. The women showed that they could ensure the regeneration of the resource and that they could discipline themselves to only harvest the mature clams, leaving the young to develop for future harvest.
- The two hectares of clams may have played a key role in enhancing the regeneration of clams throughout the lagoon. Unfortunately, the initiative did not last long enough to determine if that was the case.
- The initiative involved an impoverished population with very few resources.. They demonstrated their ability to honor their obligations and to defer harvest until the optimal period.
- With the exception of the water pollution problem that was completely beyond their control, the cooperative was able to ensure the ecological conditions necessary for this vulnerable resource and to thrive in a sensitive environment.

Basic principles for participatory management of coastal resources may be distilled as follows:

- Management should be entrusted to a legally constituted entity composed of those who hold the traditional use rights over the resource.
- The community management structure needs to be empowered with exclusive rights to the resource to be managed. No one will invest in protection, enrichment, etc, if others can harvest the fruits of their labors;
- The community management structure must be able to develop and apply rules governing the access and use of the resource to be managed;
- The financial benefits of the undertaking need to be substantially greater than the costs;
- The empowered community management group needs the support of local authorities whenever there are conflicts with other parties.