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付属資料1. 要請書

APPLICATION FOR TECHNICAL COOPERATION (DEVELOPMENT STUDY) BY THE GOVERNMENT OF JAPAN

1. Project Digest

1. Project and Study Title

- Project title
Establishing coastal/marine protected areas in the Red Sea
- Study title
Basic inventories of coastal/marine habitats in the Red Sea.
(The initial title: Basic inventories of mangrove ecosystems).

2. Location (Please see attached map).

Along the Red Sea coast of the Kingdom of Saudi Arabia including onshore and offshore islands.

3. Implementing Agency

- Name of the Agency.
National Commission for Wildlife Conservation and Development (NCWCD).
- Number of the Staff of the Agency (on a category basis).
see appended.
- Budget allocated to the Agency.
SR 50,000,000 per annum.

4. Justification of the Project

- Present conditions of the sector
The Red Sea is a unique marine system which is highly valued as a key environment for global biodiversity because of its rich coastal/marine biotopes formed in semi-enclosed and extreme arid tropical environments. It is estimated that 9% to 15% of fish species are endemic there.

However, the biotopes and the environments in the sea are considered vulnerable because of its harsh conditions; the water is unusually high in salinity, low in nutrition and high in temperature with very little supply of water from land or adjacent ocean. Fishery is the most important activity for local inhabitants, both as a source of food and income.

The biotopes such as coral reefs, reef or sand flats, seagrass land, algal forests, mangrove swamps, salt marshes, and sabkhas still remain pristine in most parts of the sea. This is in contrast to the Arabian Gulf where the other valuable marine environment has been threatened by human induced impacts. We would like to have a conservation system for the Red

Sea established before human impact became a threat. This threat is expected to accelerate explosively by the rapid urbanization and industrialization of the region.

Through a joint committee, the concerned ministries are cooperating to establish an Integrated Coastal Zone Management System. Biological aspects are the responsibility of NCWCD.

MEPA conducted surveys in the Red Sea in the early 1980 and identified areas suitable for protection. This earlier report was updated by a subsequent survey by NCWCD, who proposes 34 sites that qualify for protection in various categories. However, information and basic data are meager and only Farasan Islands and Umm al Gamari Islands have been proclaimed as protected areas. These two areas are also the only ones where intensive surveys have been conducted.

- Sectoral development policy of the national/local government

The Kingdom's unprecedented rate of development and urbanization from the beginning of the 1970's, carried with it certain harmful effects on the natural and environmental resources. These are: (1) treatment of agricultural and urban waste and sewage; (2) marine pollution, especially in the vicinity of harbours; (3) open sea marine pollution which affects local marine environments; (4) destruction of coastal habitats by landfilling and siltation; (5) threat to wildlife and a reduction in genetic diversity.

The government concern for these adverse side effects of economic development was expressed in the establishment of intersectoral coordinating, catalytic, regulatory, and monitoring institutions such as: (1) Meteorology and Environmental Protection Administration (MEPA) 1979; (2) Environmental Protection Coordination Commission (EPCC) 1979; (3) National Commission for Wildlife Conservation and Development (NCWCD) 1986.

The long-term development goals of these institutions are:

- (1) to achieve sustainable development on the basis of prudent management of available natural resources and environmental capacities,
- (2) and the rehabilitation of the environment previously subject to degradation and misuse.

All government agencies will be guided by the following objectives during the Fifth Development Plan:

- (1) to protect the environment and preserve its natural characteristics and ecosystems, and to conserve natural resources;
- (2) to protect and develop the different wildlife forms in the Kingdom, whilst maintaining ecological equilibrium and preserving diversity in animal and plant genetic resources.

In the relatively short time since it was set up in 1986, NCWCD has achieved some notable successes. This is particularly through the establishment of 14 wildlife reserves and three wildlife research centers at Thumamah, Al Taif and Qassim. The achievements of NCWCD have been conspicuous in the campaign to create a strong public awareness about conservation and protection of wildlife in the Kingdom.

- **Problems to be solved in the sector**

The rapid development in the Kingdom, which commenced in the early 1970's, has resulted in several negative by products. These are siltation, landfilling for housing developments, dumping of various waste and sewage drains, at several areas along the Red Sea coast. Danger to wildlife and reduction in genetic diversity are increasing due to inadequate protection management to remedy the situation. Only two areas have been proclaimed as protected among a number of coastal habitats proposed for protection. Our information on the coastal environment of the Red Sea is insufficient and it is important that it should be revised and updated in order to establish a system of marine protected areas and develop plans for their management.

- **Outline of the Project**

To establish a needed network of protected areas with appropriate management programs respectively for the conservation of representative biotopes in the Red Sea. The project would consists of the following steps:

- (1) To prepare, through a systematic survey, the preliminary basic information on the character and recent status of representative biotopes and habitats, identifying environmental and human impacts on the biotopes;
- (2) Based on the above mentioned survey, review and revise the justification, protection class and the extent of the area, and prioritize the initial proposed areas for protection;
- (3) Following the above mentioned priority, to undertake detailed studies necessary for the protection of biotopes, key species, habitats and determine the socio-economical background of each nominated area;
- (4) Prepare management plans for each area where the above mentioned studies are completed. The management plan will include recommendations for the amelioration of human impacts to the environment, programs for rehabilitation of degraded habitats if necessary, and various actions for increased public awareness.
- (5) Based on these preparatory stages, to initiate legal and administrative procedure for the declaration of areas in conjunction with the concerned ministries and the governors of the regions.
- (6) The process after (3) is repeated at the next area in the list.

- **Purpose (short-term objective) of the Project**
To establish a necessary protected area networks at appropriate levels of conservation, for the conservation of representative biotopes in the Saudi Arabian coast of the Red Sea.
- **Goal (long-term objective) of the Project**
To establish the most appropriate system of nature conservation and sustainable resource use for the Red Sea biotopes of global importance.

It constitutes a major component of NCWCD strategy to achieve sustainable utilization of such important marine resources, through effective conservation measures and properly designed management plans.

- **Prospective beneficiaries**
 - (1) Traditional and artisanal fishermen.
 - (2) Potential tourists both national, and expatriate.
 - (3) All Saudi nationals for the ethnic heritage as the basis of national identity.
- **The project's priority in the National Development Plan/Public Investment Program.**
Of high priority.
- 5. **Desirable or scheduled time of the commencement of the Project**
1995 - 1998
- 6. **Expected funding source and/or assistance (including external origin)**
Annual budget of NCWCD
JICA for the dispatch of researchers.
NCWCD for local expenses.
- 7. **Other relevant project, if any**
None.

2. Terms of Reference of the Proposed Study

1. **Justification of the Study**
To know the actual status of the biotopes and their socio-economic circumstances is the basis of any protection management. However, available knowledge and data are quite inadequate for the area. Only preliminary work has been conducted on small patches of the coast and most of the information is awaiting to be revised.

Accordingly, surveys and studies which includes management programming constitute the essential and major part in executing the Project, which aims to establish a network of protected areas in the red Sea as explained above in outline.

In addition to this direct necessity, the basic data like a thematic map of representative habitat types in the coast, supports all the concerned activities in the Kingdom toward biological and environmental conservation and resource use development. Public awareness requires a common basis of recognition.

2. **Justification of the Japanese Technical Cooperation**

The required studies for wildlife or biotope protection demand specialization and high technology. The NCWCD has not yet developed the expertise nor the manpower. The proposed cooperation in the Study is expected, to also provide NCWCD staff with an opportunity to be exposed to expertise and technical knowhow. This form of on-the-job training is much needed in the Kingdom of Saudi Arabia.

A JICA expert has been working on mangrove conservation and restoration for NCWCD since April 1993.

3. **Objectives of the Study**

To provide the Project with a stable basis of base line information on which to formulate strategy towards establishing the needed network of coastal/marine protected areas in the Red Sea. This will consist of:

- (1) Preparing the basic and systematic information on representative biotopes throughout the Saudi Arabian Red Sea coast. It will identify and review the justification, recent status, social background and environmental impacts, protection level, area border, and prioritizing the proposed areas for protection.
- (2) Outlining a management plan which would allow sustainable utilization for the area with the highest priority, as a model based on detailed studies on biotopes, key species, habitats, socio-economical situation and so on. Appropriate measures for rehabilitation will also be proposed when necessary.

4. **Area to be covered by the Study**

Along the Saudi Arabian coast of the Red Sea including offshore islands.

If the scale of the Study needs to be reduced the northern Red Sea is of higher priority.

5. **Scope of the Study**

- (1) Basic inventories on the status of representative biotopes and habitats in the Saudi Arabian coast of the Red Sea.

To conduct inventories on biotopes based on the types of coastal/marine habitats within the littoral, intertidal, and subtidal zone, between 1km line from the shoreline and the fringing coral reef, or the subtidal zone shallower than 10m in depth. Socio-economical background and human induced impacts to the biotopes or habitats will also be identified and evaluated.

The survey will be analysing satellite images to draw a thematic map of habitats (similar to a vegetation map) backed up by field studies for identification and literature studies.

- (2) Selection of proper areas to be protected.
Based on the above mentioned survey, to review the justification for protection, the protection class, the border, and environmental impacts for each important biotopes or key species. To prioritize the above selected areas for habitat protection, revising the existing list of proposed protected areas.

- (3) Detailed studies for protection as a model in the top nominated area.
To conduct the detailed studies necessary for protection management on the biotopes, key species, habitats, socio-economical background, structure of human induced impacts etc. in the selected areas.

Effective measure are also examined if restoration is needed for the key habitat in the area.

- (4) Proposal of a management plan for protection and sustainable resource use of the area.
To prepare the management system and programs for the area based on the above mentioned studies. The management plan includes means for amelioration of human impacts to the environment, programs for restoration of degraded habitats if necessary, and the suggestion for increasing public awareness.

(5) Study Schedule

<u>Jobs</u>	<u>Duration</u>			
	1995	1996	1997	1998
(1) Basic inventories	—	—	—	
(2) Selection of areas to be protected		—	—	
(3) Detailed studies as a model			—	—
(4) Proposed management plan				—

(6) Expected Major Outputs of the Study

- (1) Biotope maps at the scale of 1:100,000 (or 1:50,000 for nominated areas if better) along Saudi Arabian Red Sea coast with basic information of the present status.
- (2) To identify where protected areas should be established, with a prioritized list.
- (3) An outline of management plan for the top nominated area for biotope/protection, with necessary data for management and monitoring on biotopes, ecology, socio-economic background, human pressure, and with suggested means for restoration of deteriorated biotope/habitat.
To outline management plans.
- (4) Some of the scientific equipment will be available such as automatic climatic recorders and automatic tide gauges which are required for continued study and monitoring, thereafter.
- (5) Transfer of technology and training of the counterparts.
- (7) Request of the Study to other donor agencies, if any
None
- (8) Other relevant information, if any
None.

3. Available data, information for the Study Team, etc.

- 1) Assignment of counterpart personnel of the implementing agency for the Study.
Three research officers, B. Sc. or a higher degree.
- (2) Available data, information, documents, maps and facilities etc. related to the Study.

Topographical map - 1:2,000,000; 1:500,000; 1:250,000; 1:50,000.

There are two types of description on the 1:50,000 maps. Photo map series covering major parts of the mainland coast, identifying mangrove habitation though the aerial data of the series, were prepared in late 70's. Meanwhile, developing areas and offshore islands seem to be covered with more simplified description neglecting mangroves.

Hydrographical chart -

Aerial photo in mosaic - There are charts in existence, but are not available.

- (3) Information on the security conditions in the Study Area
As secure as any other part of the country which is well known as one of the best secure countries.

Most of the area is accessible by a 4 wheel drive vehicle or a small boat equipped with outboard engines. However, some parts are not easy to access or for living, because of topography and scattered settlements. The sea and the weather are usually safe and stable. Assistance from NCWCD will be expected to provide the necessary 4x4 vehicles, camping equipment and if necessary an aircraft for aerial surveys.

4. Global Issues (Environment, Women in Development, Poverty, etc)

- (1) Environment components (such as pollution control, water supply, sewage, environmental management, forestry, biodiversity) of the Project, if any
Yes. The project is consisted of only the environment components.
- (2) Anticipated environmental impacts (both natural and social) by the project, if any.
None. The project is for the protection of the environment from impacts.
- (3) Women as main beneficiaries or not
Not. The beneficiaries are beyond gender and generation.
- (4) Project components which requires special considerations for women (such as gender difference, women specific role, women's participation), if any.
None.
- (5) Anticipated impacts on women caused by the Project, if any
None.
- (6) Poverty reduction components of the Project, if any
The project shall contribute to the national income and assist local traditional fishermen, through sustainable utilization of the natural resources of the area.

Appropriate protection of productive habitats in the coastal zone is crucial means to sustain the traditional production and life in the region.

- (7) Any constraints against the low-income people caused by the Project
Not what so ever.
Nobody depends directly on mangrove forests for daily demands of life in recent KSA besides the exceptional uses of wood at fishing camps or traditional uses of foliage for grazing. The study will find out proper control for sustainable exploitation.

5. Undertaking of the Government of KSA

In order to facilitate a smooth and efficient conduct of the Study, the Government of KSA shall take the following necessary measures:

- (1) secure the safety of the Study Team.
Yes.
- (2) permit the members of the Study Team to enter, leave and sojourn in KSA in connection with their assignments therein, and exempt them from alien registration requirement and consular fees.
Yes.
- (3) exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of KSA for the conduct of the Study.
Yes.
- (4) exempt the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study Team for their services in connection with the implementation of the Study.
Yes.
- (5) provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in KSA from Japan in connection with the implementation of the Study.
Yes.
- (6) secure permission or entry into private properties or restricted areas for the conduct of the Study.
Yes, in as much as possible.
- (7) secure permission for the Study to take all data, documents and necessary materials related to the Study out of KSA to Japan.
Yes, as far as copies of all the important data is left behind.
- (8) provide medical services as needed. Its expenses will be chargeable to members of the Study Team.
Yes.

6. The Government of KSA shall bear claims, if any arises against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team.

7. NCWED shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organization concerned for the smooth implementation of the Study.

The Government of KSA is assured that the matters referred to in this form will be ensured for a smooth conduct of the Development Study by the Japanese Study Team.

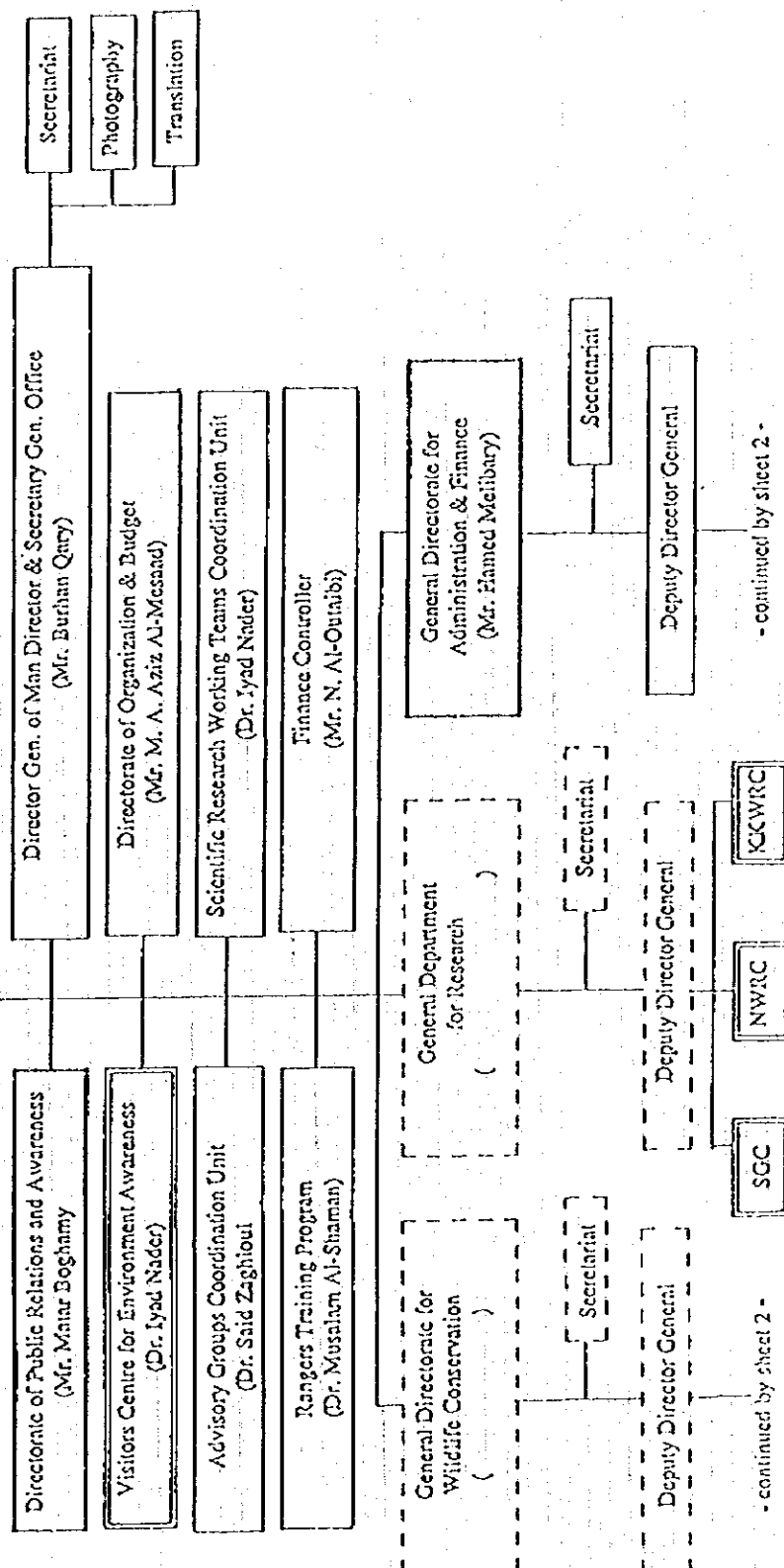
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NNWRC: National Wildlife Research Centre, Taif
 KKWRC: King Khalid Wildlife Research Centre, Thumamah
 SGC: Centre of Prince Mohammed Al-Sudairy for Gazelle Research, Qassim.

Prince Sultan bin Abdul Aziz Al Saud
Prince Saud Al-Faisal
Prince Naif Al-Abdul Aziz
Prince Khalid Al-Faisal
Prince Salman bin Abdul Aziz
Mr. Fuhham Nader
Minister of Agriculture and Water
Dr. Saleh Al-Athel, President of KAC
Dr. Abdulsar Al-Gain
Dr. Abdulaziz H. Abuzinada

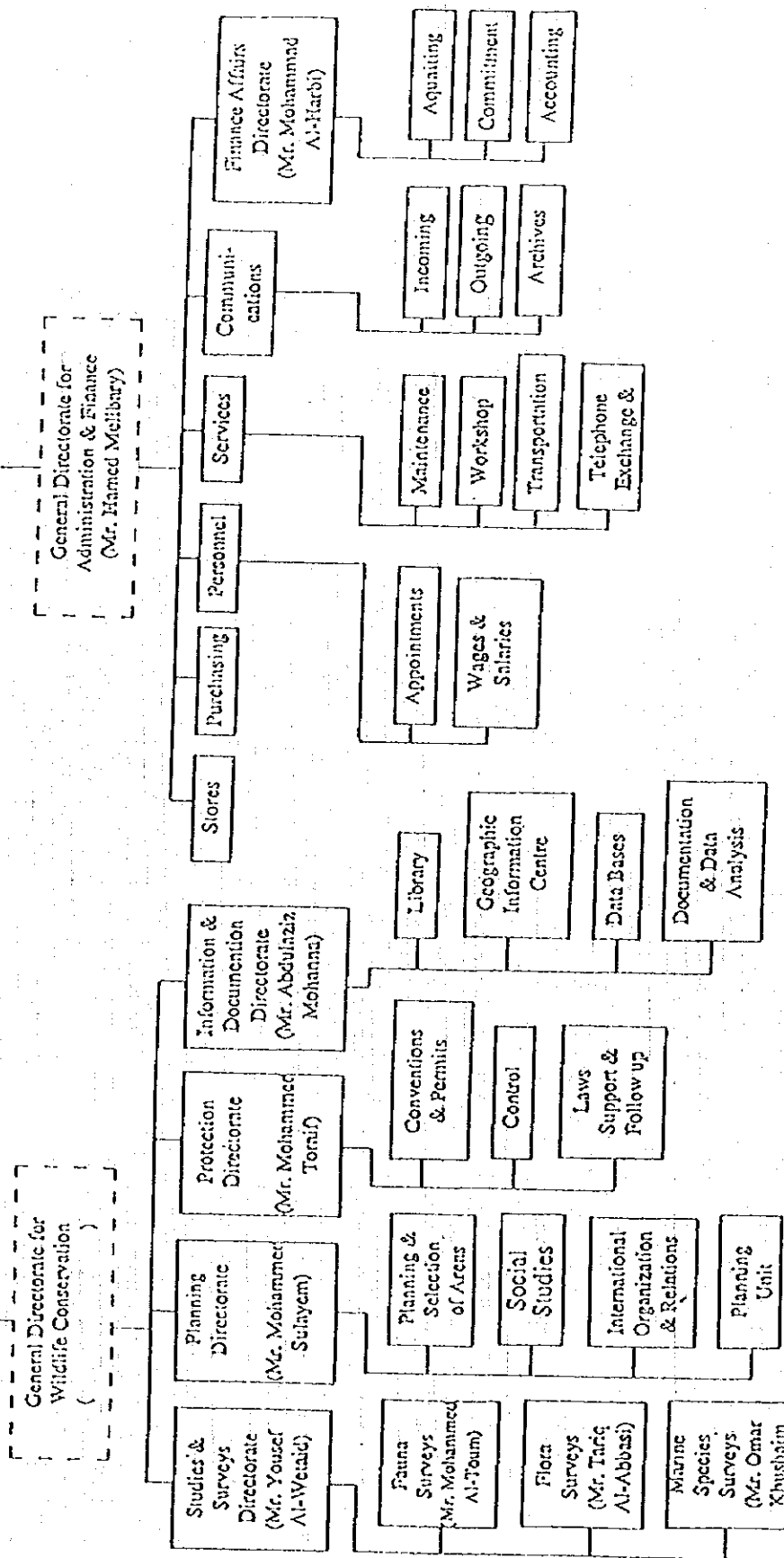
Managing Director
(Prince Saud Al-Faisal)

Secretary General
(Dr. Abdulaziz H. Abuzinada)



- continue to sheet 1 -

- continue to sheet 1



EJ/NA/DEM/MEETING-2

APPENDIX

Number of NCWCD Staff

Particulars	Saudi	Non-Saudi	Total
Employees	69	3	72
Labour wages	11	33	44
Fixed sum wages	127	67	194
Taif Consultants	-	5	5
Thumamah Consultants	-	7	7
Aviation Department	3	6	9
Maintenance & Cleaning	-	15	15
	<u>210</u>	<u>136</u>	<u>346</u>

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(翻 訳)

日本政府の技術協力（開発調査）に対する要請書

1.（開発調査を必要としている）プロジェクト要旨

1. プロジェクト及び開発調査の名称

- ・（開発調査を必要としている）プロジェクト名

紅海における沿岸／海洋保護区の確立

- ・（同プロジェクトを推進するための）開発調査名

紅海における沿岸／海洋生息域（habitats）の基礎インベントリー調査

（元名：マングローブ生態系の基礎的インベントリー調査）

2.（プロジェクト対象）地域

紅海の島しょ部を含むサウディ・アラビア国沿岸部

3.（プロジェクト）執行機関

- ・機関名

野生生物保護委員会（NCWCD）

- ・機関職員数

別添資料参照（サウディ人210、外国人136、計346人、うち正職員72人）

- ・機関予算額

年間SR50,000,000（\$1=¥100として13億3千万円）

4.（標記）プロジェクトの必然性

- ・該当分野の現状

紅海は、その半閉鎖的で極端に乾燥した熱帯環境のもとに形成された豊かな沿岸／海洋のゆえに、地球規模での生物多様性にとって鍵となる環境の一つであるとして高く評価されている独特の海洋系である。その魚種の9ないし15%は固有種だと推定されている。

しかし、この海の生物界と環境はその過酷な諸条件のゆえに傷つきやすいものと考えられる。陸水や隣接する海洋からの水の供給がほとんどないため、海水の塩分は異常に高く、栄養は乏しく、水温は高い。そしてそこでは漁業が地域住民にとって食料源としても収入源としても最重要の活動となっている。

この海の大半の地域では、サンゴ礁・岩礁や砂州（潮間帯や亜潮間帯に広がる極めて平坦な生物起源の岩ないしその上に砂をのせた地形）・海草・海藻林・マングローブ沼沢・塩性植物原（ソルトマーシュ）・塩沢地（サブカ）などの生物界がいまだ原始状態にある。これはもうひとつの傷つきやすい海洋環境アラビア湾が人間のもたらす衝撃によって脅威にさらされているのと対照的である。われわれは人間の衝撃が現実の脅威となる前に紅海の保全システムを確立したいと願っており、その脅威はこの地域で進む急速な都市化と工業化によって爆発的に加速すると予期される。

関係省庁は合同委員会を設けて総合的沿岸地域管理システムを確立すべく協力中であり、生物学的側面が野生生物保護委員会の責任下にある。

MEPA（国防航空省気象環境保護庁）が1980年代前半に紅海の調査を実施し、保護すべき地域を選びだした。この初期の報告に引き続き野生生物保護委員会も一度調査を行い、いくつもの形で保護に値するものとして34か所を提案した。しかしながら情報と基礎データは貧弱なもので、これまでわずかにファラサン諸島とウム・アル・ガマリ諸島だけが保護区として公布されているにすぎないし、これまで本格的な調査が行われたのもこの2地域だけである。

・該当分野の政府／自治体の開発政策

王国における1970年代初めからの未曾有の発展と都市化は自然や環境資源に対し一定の有害な影響を伴ってきた。それは

- (1) 農業及び都市の廃棄物と排水・下水、
- (2) とくに港湾近辺における海洋汚染、
- (3) 局地的海洋環境に影響する外洋汚染、
- (4) 埋め立てや粘土の拡散・懸濁・堆積（シルテーション、主に浚渫による）海岸生息環境（habitat）の破壊、
- (5) 野生生物への脅威と遺伝子多様性の減少、などである。

経済発展にともなうこれら逆効果に対する政府の関心の高さは、

- (1) 1979年の気象環境保護庁（Meteorology and Environmental Protection Administration, MEPA）
- (2) 1979年の環境保護調整委員会（Environmental Protection Coordination Commission, EPCC）
- (3) 1986年の野生生物保護委員会

等、分野を越えた調整・触媒・規制・監視等の機関と制度の設置に現れている。

これらの機関の長期的な開発ゴールは、

- (1) 利用しうる自然資源と環境容量の慎重な管理にもとづく持続可能な発展の達成
- (2) 及び従来劣化と誤用にさらされてきた環境の修復である。

第五次開発計画の間、すべての政府機関は以下に述べる目標を目安にする。

- (1) 環境を保護し、自然の特性と生態系を保存し、自然資源を保守すること、
- (2) 王国内における生態学均衡を保持し、動植物遺伝子資源の多様性を保存しながら、
いろいろな野生生物群を保護し増強すること、

野生生物保護委員会は1986年の設立以来、比較的短時間の間にいくつかの特記すべき成功を収めた。これは特に14の野生生物保護区とトゥママ、アル・タイーフ及びカシームの三つの野生生物研究センターの設置である。野生生物保護委員会の成果は野生生物の保全と保護に関する社会の強い認識を生み出すキャンペーンによく見られる。

・該当分野で解決すべき諸問題

1970年代初めに始まった王国の急激な発展はその所産としていくつかの否定的な結果を招いた。紅海でも数か所で粘土の拡散・懸濁・堆積、住宅供給のための埋め立て、各種廃棄物投棄と下水の排出などがある。野生生物に対する危険と遺伝的多様性の減少は、状況を救済すべき保護行政が不十分なために増大している。保護すべしとして提案された多数の生息域の中でたった2か所が保護区として公布されたにすぎない。われわれの紅海沿岸環境についての情報は不十分である。海洋保護区群の体系を確立し、それらの管理計画を策定していくためには、情報を最新のものに更新・改訂することが緊急である。

・プロジェクトの概要

紅海における代表的な生物界の保全に必要な、それぞれ適切な管理プログラムをもった保護区網の確立。このプロジェクトは下記の諸段階からなるだろう。

- (1) 組織的な調査を通じて、生物界に対する環境と人間による衝撃を見分けつつ、代表的生物界と生物域の性格と最近の状態について予備的基礎的な情報を整える。

- (2) 上記調査にもとづき、提案されている当初案保護区予定地について、必然性、クラス別、範囲、優先順位を見直し、改訂する。
- (3) 上記優先順位にしたがって、生物界・鍵となる種生息域等の保護に必要な詳しい調査研究に着手し、合わせて各候補地の社会経済的背景をおさえる。
- (4) 上記研究が完了した各地域ごとに管理計画を用意する。管理計画は、人間活動がその環境に与える衝撃の改善、また必要なら劣化した生息域の修復のためのプログラム類、社会の認識を高めるためのさまざまな行動を含む。
- (5) これらの諸準備を踏まえて、関係他省庁及びその地域の知事たちとの共同で、保護区布告のための法的・行政的手続きに入る。
- (6) 第三段階以降はリスト中の次の地域に移って繰り返される。

・プロジェクトの目的（短期目標）

紅海サウディ・アラビア沿岸における代表的生物界の保全のために、適切な保護レベルで必要な保護区網を設置する。

・プロジェクトの到達目標（長期目標）

地球的重要度を持つ紅海の生物界のために、もっとも適切な自然保護と接続可能な資源利用のシステムを確立する。

野生生物保護委員会の主要任務の一つは、有効な保全手段と適当に設計された管理計画を通じて、このように重要な海洋資源の持続可能な利用を実現していくことにある。

・期待される受益者

- (1) 伝統的個人漁業者
- (2) 国民・非国民を問わぬ滞在的旅行者
- (3) 国家的なアイデンティティの基礎たる民族の資産を相続する全サウディ・アラビア国民

・国家開発計画／公共投資計画のなかでの本プロジェクト優先度
高い優先度

5. プロジェクト開始の希望または予定時期

1995～1998（＊宮本注：これは最優先保護区についての予定）

6. 資金源及び補助（国外からのものも含む）

野生生物保護委員会の年次予算

JICAの開発調査派遣費

野生生物保護委員会の地元負担

7. その他関連プロジェクト

なし

2. 提案する開発調査の考慮事項 (TOR)

1. 開発調査の必然性

各生物界の実際の状態とその社会経済的情勢を知ることはすべての保護管理の基礎である。しかしながらこの地域について利用できる知識やデータは極めて不十分なものである。単に海岸線のあちこちの小範囲の予備的な仕事が行われてきたにすぎず、その情報も多くが更新を待っている。

したがって調査と、管理計画を含む研究とは、上に概要を説明したように、紅海における保護区網の確立をめざす本プロジェクトの遂行上、不可欠で主要な部分となる。

この直接的な要求に加え、この海岸の代表的な生息域 (habitat) タイプの地図のような基礎的データは、王国における生物や環境の保全と資源利用の開発に向けてのすべての関連活動を支えるものとなる。社会の認識普及にも共通の土台が必要である。

2. 日本の技術協力の必要性

野生生物あるいは生物界の保護のために要求される調査は専門性と高度技術を必要とする。野生生物保護委員会はいまだその専門能力も人手に十分に開発できていない。提案した開発調査による協力は、野生生物保護委員会職員に専門能力と技術的知識に触れる機会を与えることにもなる。サウディ・アラビア国ではこのような形の実際の仕事を通じた訓練 (オンザジョブ・トレーニング) が大変必要である。

ちなみに1993年4月からJICA専門家が一人マングローブの保全と修復に関して野生生物保護委員会のために働いている。

3. 開発調査の目標

(標記) プロジェクトに、紅海で求められる沿岸/海洋保護区網の確立を目指す戦略を立案するための基線となる情報の安定した土台をあたえることである。これは以下の内容を含む。

- (1) 全サウディ・アラビア紅海岸の代表的生物界について基礎的で体系的な情報を準備する。これによって必然性・現状・社会的背景・環境に対する衝撃・保護レベル・保護区域・保護区候補地間の優先順位の確認と見直しを行うことになる。
- (2) 最優先地域については、生物界・鍵となる種・生息域・社会経済的状况等々に関する

るより詳細な研究にもとづくモデルとして、持続可能な利用を許容する管理計画の
大要を示す。また、必要ならば適切な修復手段も提示する。

4. 開発調査がカバーすべき地域

沖合の島々を含む紅海サウディ・アラビア全海岸線。

開発調査の規模を縮小する必要がある場合は紅海北部を優先する。

5. 開発調査の範囲 (Scope of the Study)

(1) 紅海サウディ・アラビア海岸の代表的生物界と生息域の状態に関する基礎的インベ ントリー調査

渚線から1kmの線とサンゴ礁外縁 (fringing coaral reef) ないし水深10m以浅の
亜潮間帯の間にある岸辺 (littoral zone)、潮間帯 (intertidal zone)、及び亜潮
間帯 (subtidal zone) の範囲で沿岸／海洋生息域 (生息環境、coastal/marine
habitats) のタイプにもとづいた生物界のインベントリー調査を実施する。同時に
その生物界ないし生息域に対する社会経済的背景と人間のもたらす衝撃も確認し、
評価する。

この調査は (植生図と類似の) 生息域地図 (thematic map of habitats) を描くた
め、現地調査による確認と文献調査で裏付けをしつつ、衛星画像の分析を行うこと
になろう。

(2) 保護すべき地域の選定

上記調査にもとづき、保護の必然性・保護のクラス別・境界・各重要生物界ないし
鍵となる種群に対する環境的衝撃を見直す。既存の保護区提案地リストの改訂を行
いつつ、上記生息域保護の対象として選定された地域間の優先順位を判定する。

(3) 最優先として推挙された地区における保護のためのモデル的詳細調査

選定地域内の生物界・鍵となる種群・生息域・社会経済的背景・人間のもたらす衝
撃の構造その他について、保護管理に必要な (範囲で) 詳細調査を実施する。

その地域の鍵となる生息域の修復が必要な時には、そのための効果的手段も検討す
る。

(4) その地域の保護と持続的な資源利用のための管理計画の提言

上記調査にもとづいてその地域のための管理システムとプログラムを用意する。管
理計画には環境に対して人間の与える衝撃を和らげる手だて、必要があれば劣化し
た生息域を修復するプログラム、あるいは社会の認識を高めるための示唆などを含
むものとする。

(5) 調査スケジュール

〔作業〕	〔期間〕			
	1995	1996	1997	1998
(1) 基礎インベントリー調査	—	—	—	
(2) 保護すべき地域の選定		—	—	
(3) モデルの詳細調査			—	—
(4) 管理計画の提言				—

(6) 開発調査で期待する主要アウトプット

1) 紅海サウディ・アラビア沿岸の現在の状態（生物界と環境）についての基礎情報を記載した 1/100,00（あるいはその方がよければ候補地部分は 1/50,000）の生物界地図（Biotope map）。

2) どこに保護区を設定すべきかの識別と優先順位リスト。

3) 管理計画の概要を提示する。

生物界保護最優先地域に対する管理計画の概要と、管理とモニタリングに必要な生物界・生態・社会経済的背景・人間の圧力に関するデータ。及び荒廃した生物界／生息域の修復手段。

4) 以後の継続調査やモニタリングに必要な自動気象記録器や自記潮位計などいくつかの科学機材も役立つ。

5) 技術の移転とカウンターパートの訓練。

(7) 他の援助機関に対する本開発調査案件の要請
なし。

(8) 他の関連情報
なし。

3. 調査団が利用できるデータ・情報など

1. 開発調査実施機関のカウンターパート要員の任命

B.Sc. 以上の学位を持つ調査官3名。

2. 開発調査に関連して利用できるデータ・情報・文書・地図及び施設等

地形図-- 1/2,000,000図、1/500,000図、1/250,000図、1/50,000図。

1/50,000には2種類の表現形がある。本土沿岸の大部分をカバーしているフォト・マップ・シリーズは航空測量データによってマングローブ植生を識別しているが、1970年代後期に用意されたものである。他方、発展中の地域や沖合島しょ部はマングローブを識別しないより簡単な表現でカバーしていると見られる。

格子状航空測量写真--存在するが入手できない。

3. 開発調査対象地の治安情報

もっとも治安のよい国の一つとして広く知られる当国の他のどことも同じように安全である。

対象地域のほとんどのところは4輪駆動車か船外機をつけた小型ボートでアクセスできる。しかしながらいくつかの場所は、地形やあまりに村落から遠いために、近づいたり居住したりすることが容易ではない。海と天候は通常安全で安定している。野生生物保護委員会からの支援として、必要な4×4車輛、キャンプ装備、また、必要なら航空調査用に飛行機の提供も期待できよう。

4. グローバル・イシュー（環境・開発における女性・貧困等々）

- (1) 標記プロジェクトの環境的要素（公害抑制・水供給・下水・環境管理・林業・生物多様性）の有無

あり。本プロジェクトは環境的要素だけで構成されている。

- (2) 同プロジェクトによって懸念される環境衝撃（自然的・社会的共）の有無

なし。本プロジェクトは環境を衝撃から護るためのものである。

- (3) 主たる受益者は女性か否か

否。受益者は性別や世代を超越している。

- (4) 女性に対する特別の考慮を要する要素（性差・女性だけの役割・女性参加）の有無

なし。

- (5) 同プロジェクトによって懸念される女性に対する衝撃の有無

なし。

- (6) 同プロジェクトの貧困撲滅要素の有無

本プロジェクトは、当該地域の自然資源の持続可能な利用を通じて国家収入の増加に貢献し、地域の伝統漁民を助けることになるだろう。

沿岸部の生産性の高い生息環境の適切な保護はこの地方の伝統的生産と生活を支えるための不可欠の手段である。

- (7) 同プロジェクトによる低収入の人々との摩擦があるか

まったくなし。

近年のサウディ・アラビア国では、漁業キャンプなどで例外的な木材の使用や放牧のための飼料に伝統的な利用があるほかは、日々の生活の必要から直接マングローブ林に依存している人はいない。開発調査は持続的に利用しつづけるために相応しい抑制を見つけることになるだろう。

5. サウディ・アラビア国政府の負担

(以下省略)

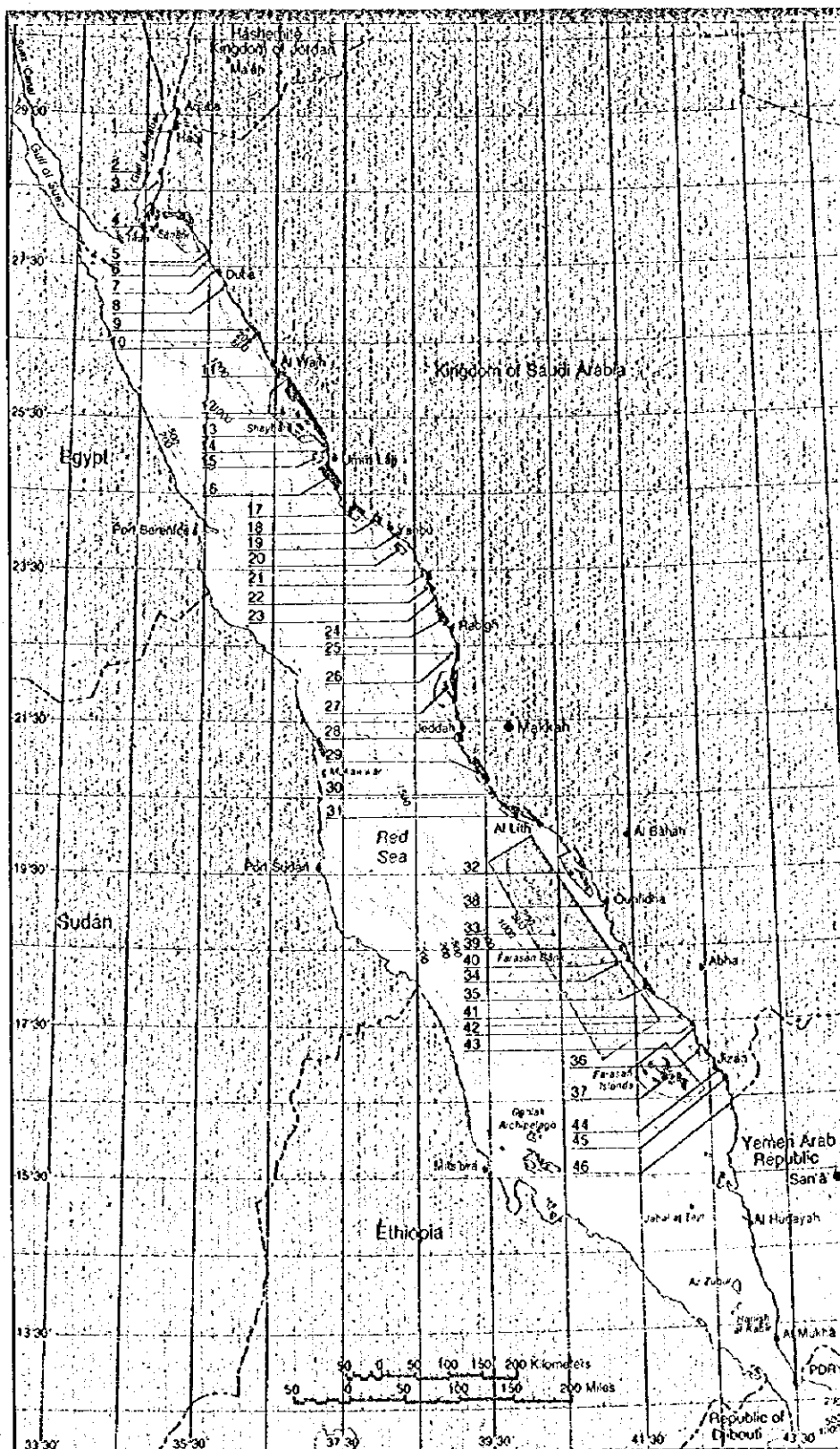
Figure 8

Environmentally Sensitive Areas

Environmentally Sensitive Areas

1. Humaydah Beach
2. Ras Suwail
3. Maqna North Beach
4. Tiran Island Area
5. Al Muwailih
6. Sharm Yahar to Sharm Jubba
7. Sharm Zubeir
8. Coastline South of Sharm Zubeir
9. Ghubbet Bal'aksh
10. Sharm Dumagha; Sharm Antar
11. Sharm Habban to Sharm Munaybirah
12. Wajh Bank
13. Qalib Island Chain
14. Umm Lajj
15. Al Hasani and Libana Islands
16. Ras Abu Madd to Sharm Hasi
17. Sharm al Khaur
18. Sharm Yanbu
19. Yanbu City Conservation Area
20. Shihb Green Reef Complex
21. Marsa al Usalla
22. Mersa Tawit
23. Mastura Beach
24. Mersa as Sarraj
25. Marsa Umm Misk
26. Haramil Island
27. Ras Hatiba
28. Jeddah Salt Marshes
29. Shu'aybah
30. Abu Duda
31. Qishran
32. North Inner Farasan Bank Reefs and Islands
33. North Outer Farasan Bank Reefs and Islands
34. Marqa Island
35. North and South Sharm Wasm and Al Quhma Village and Qadimbat Island
36. Khawr al Ja'atirah Area and Islands
37. Farasan Archipelago
38. South Qunfidah
39. Khor Amiq and Raqa
40. Khor Nahud
41. Khor Itwad
42. Shihb Abu Al Liqa
43. Shihb Al Kabir
44. South Jizan Beach
45. Khor Al Wahla
46. Oreste Point

Bathymetry in Metres
Scale - 1:8,695,652
Projection - Lambert Conformal Conic



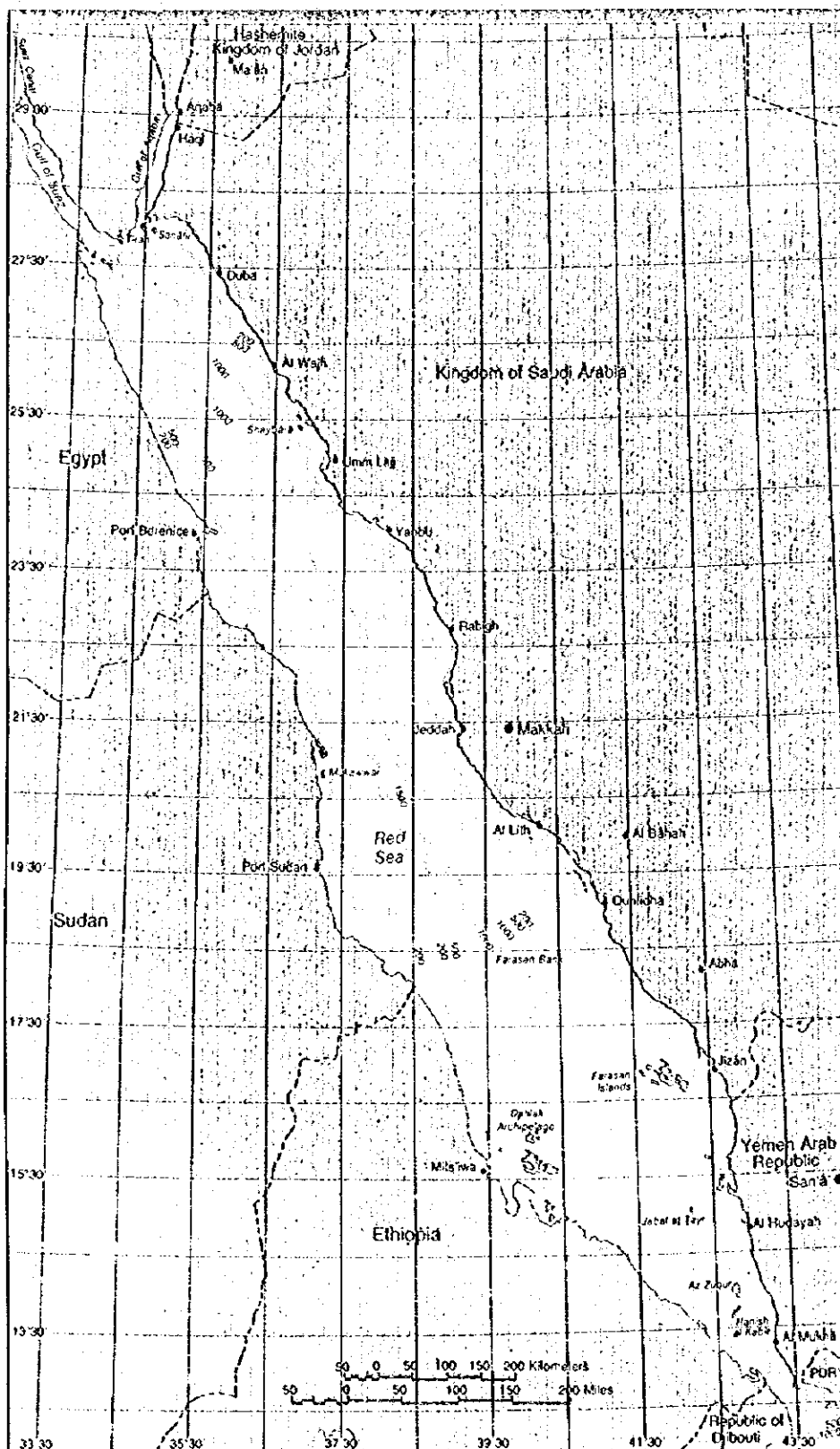


Figure 9

Biological Productivity



Coastal Strip



Offshore Zone

Note: Productivity in the coastal strip is up to approximately 50 x the productivity of the offshore zone. This productivity estimate is only shown for the Saudi Arabian coast.

Bathymetry in Metres
Scale—1:8,695,652
Projection—Lambert Conformal Conic

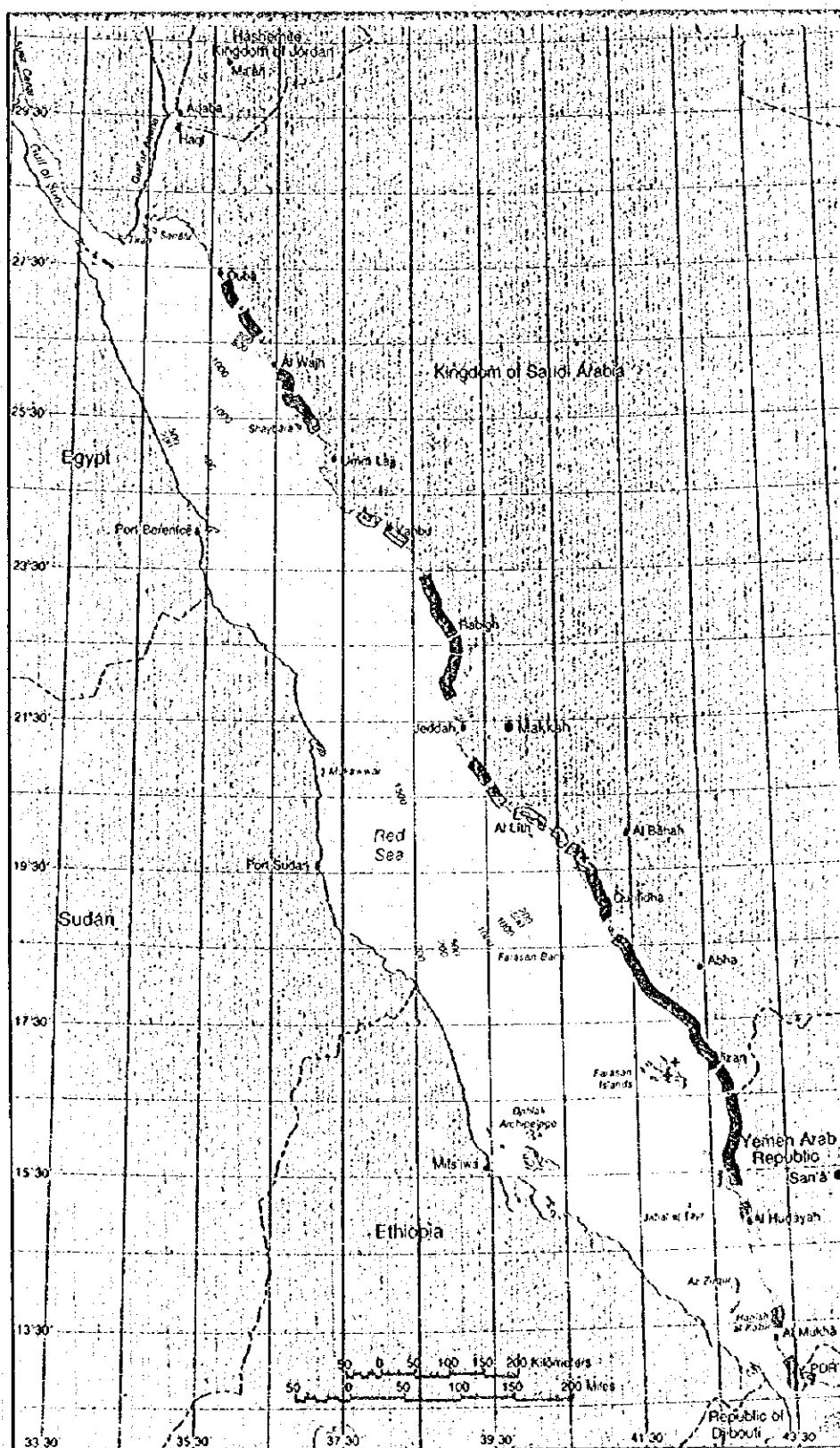


Figure 10

Mangroves

Relative Abundance of *Avicennia marina*

High (> 10,000 m², quadrat⁻¹)

Medium (1,000-10,000 m², quadrat⁻¹)

Low (< 1,000 m², quadrat⁻¹)

Rhizophora mucronata

Note: Average area of mangroves per degree of latitude calculated from quadrat data excluding offshore islands (see Introduction).

Bathymetry in Metres
Scale—1:8,695,652
Projection—Lambert Conformal Conic

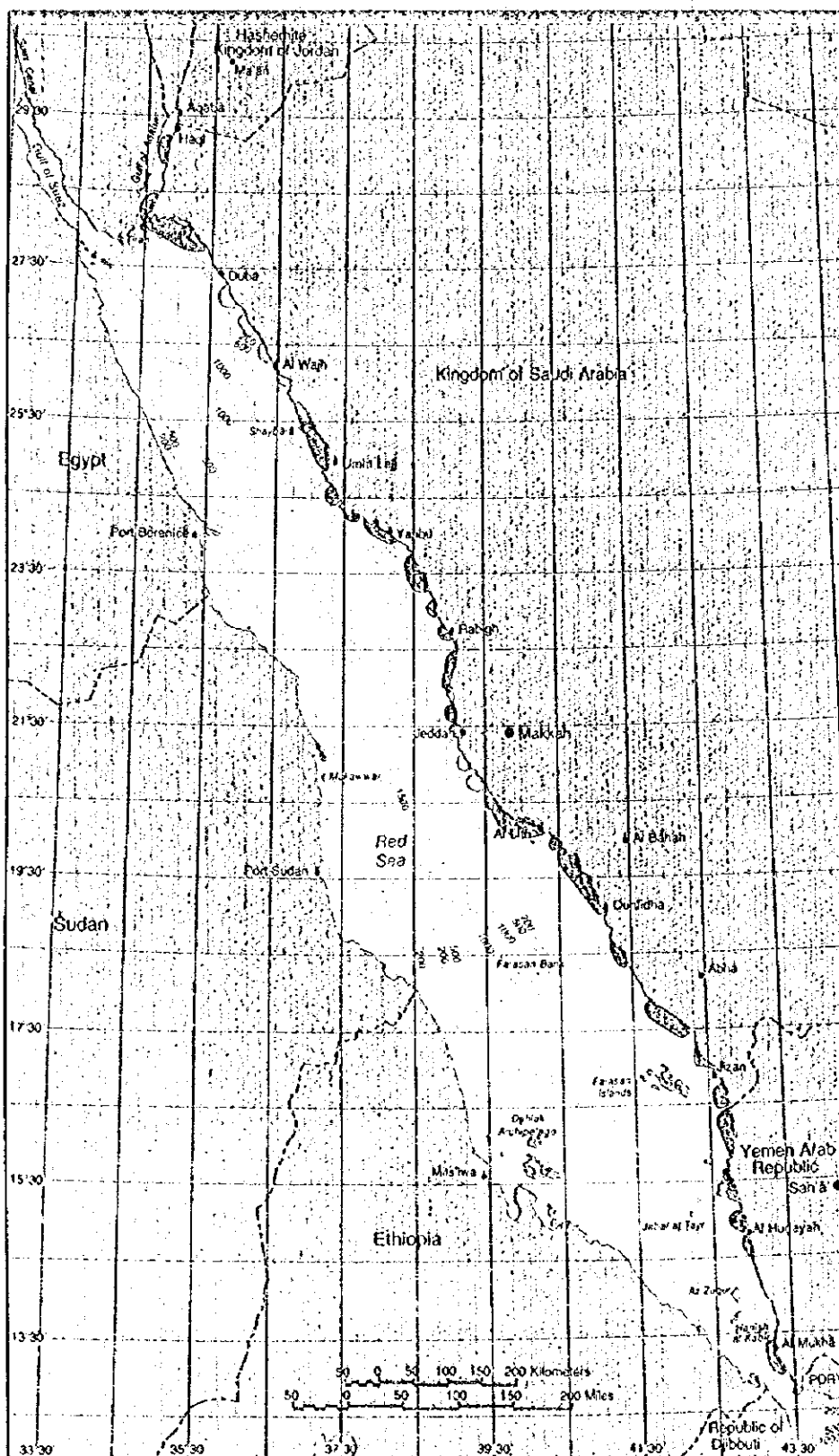


Figure 13

Seagrasses

Relative Abundance of Seagrasses



High ($> 10,000 \text{ m}^2, \text{quadrat}^{-1}$)



Medium ($1,000-10,000 \text{ m}^2, \text{quadrat}^{-1}$)



Low ($< 1,000 \text{ m}^2, \text{quadrat}^{-1}$)

Note: Average area per degree of latitude calculated from quadrat data excluding offshore islands (see Introduction).

Bathymetry in Metres
Scale—1:8,695,652
Projection—Lambert Conformal Conic

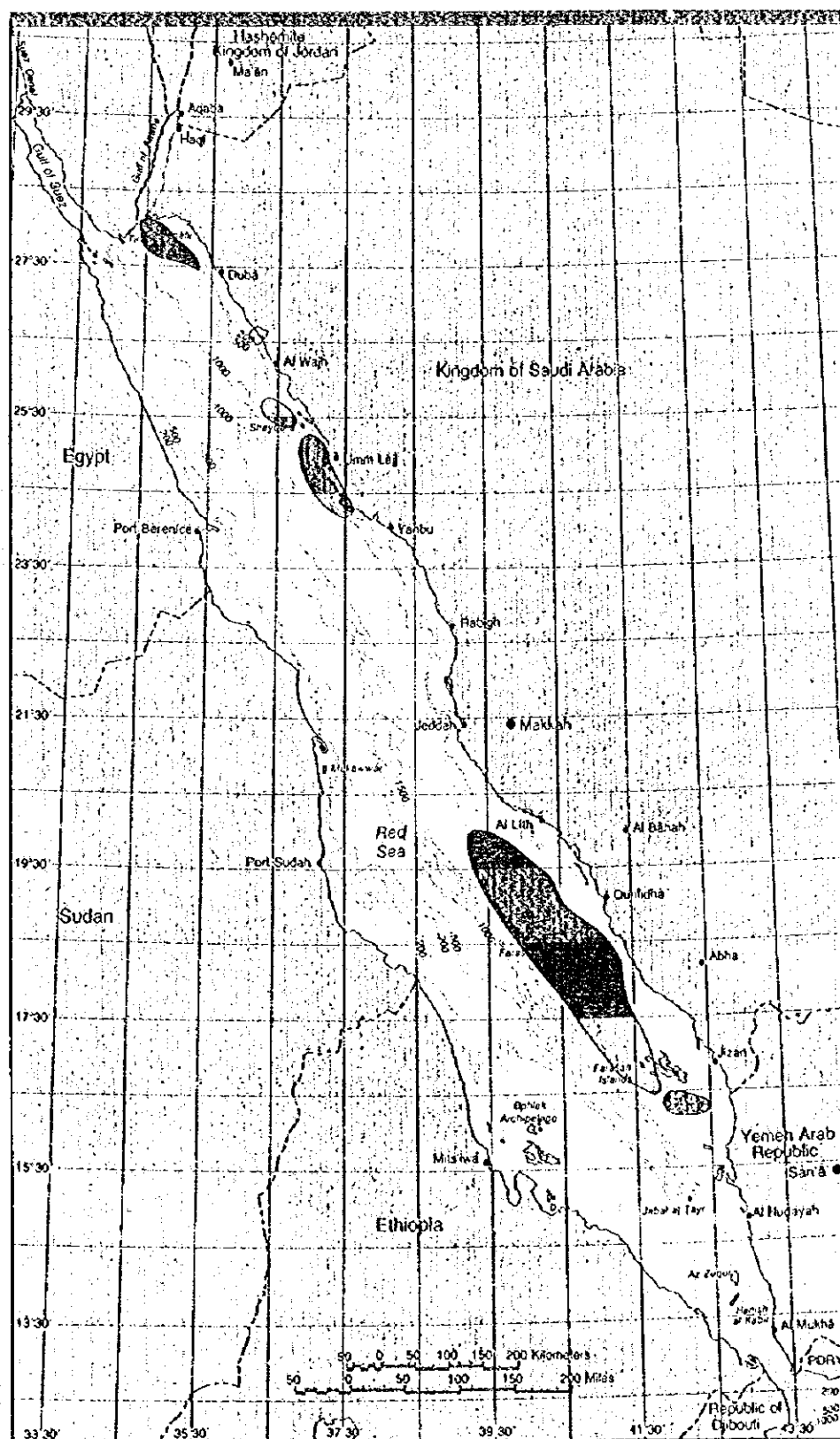


Figure 14

Turtles

Relative Abundance of Nesting Population



High (> 300)



Medium (100-300)



Low (< 100)

Note: Average area per degree of latitude calculated from quadrat data excluding offshore islands (see Introduction).

Bathymetry in Metres
Scale - 1:8,695,652
Projection - Lambert Conformal Conic

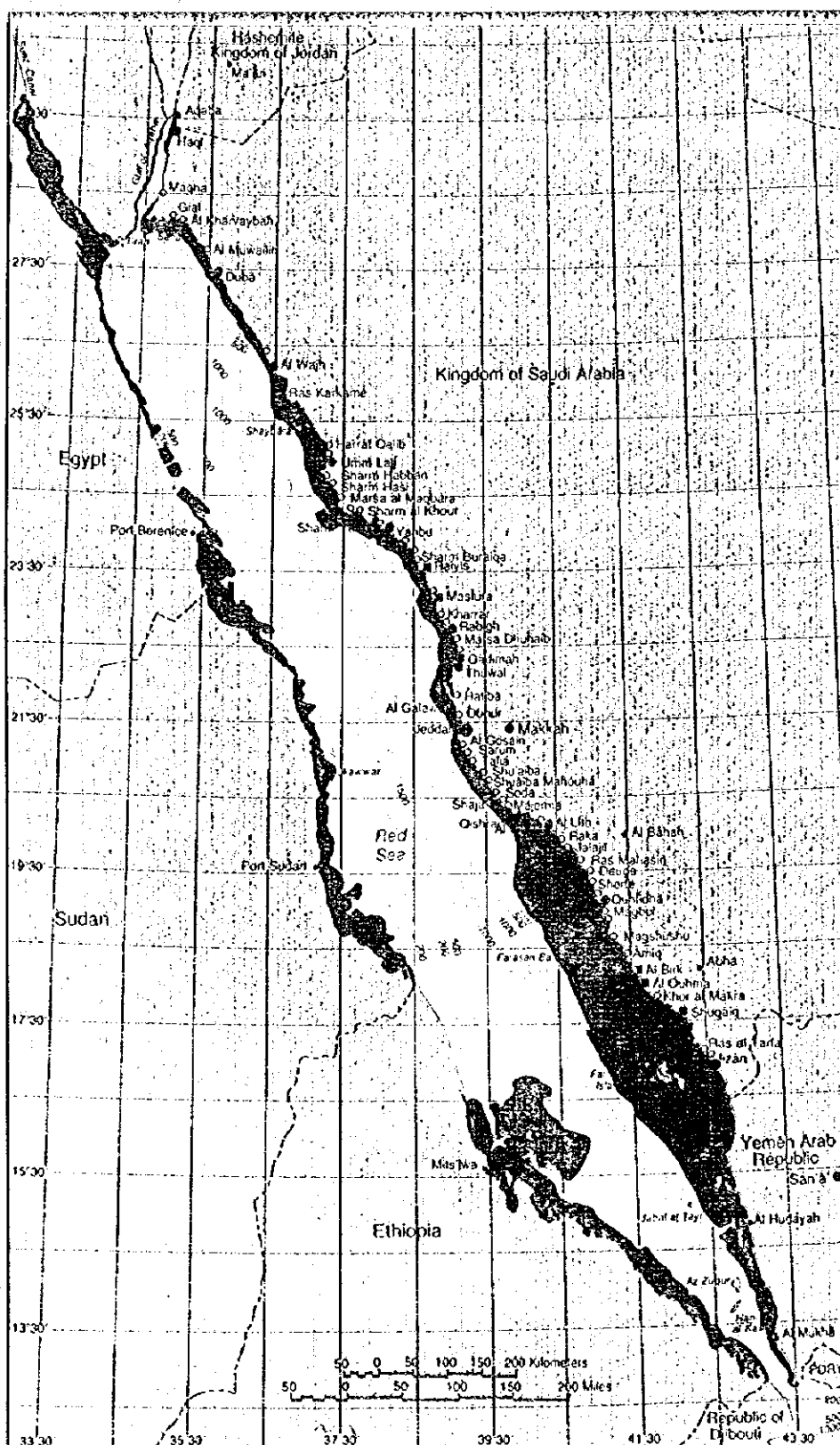










Figure 15

The Red Sea Fishery

-  Principal Commercial Fishing Grounds
-  Commercial Fishing Ports
-  Artisanal Fishing Grounds
-  Fishing Communities
-  Fishing Camps
-  Fishing Villages
-  Fishing Towns
-  Fishing Cities

Bathymetry in Metres
Scale—1:8,695,652
Projection—Lambert Conformal Conic

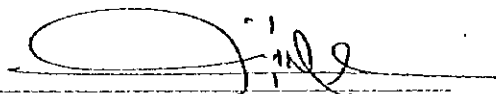
付属資料2. 予備調査時協議議事録 (M/M)

MINUTES OF MEETING
ON
THE PREPARATORY STUDY
FOR
THE STUDY
ON
COASTAL/MARINE HABITAT AND BIOLOGICAL INVENTORIES
IN
THE NORTHERN PART
OF
THE RED SEA COAST
IN
THE KINGDOM OF SAUDI ARABIA

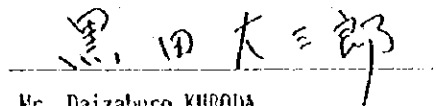
AGREED UPON BETWEEN

NATIONAL COMMISSION FOR
WILDLIFE CONSERVATION AND DEVELOPMENT
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

RIYADH, December 4, 1996



H.E. Prof. Dr. Abdulaziz H. Abu-Zinada
Secretary General
National Commission for
Wildlife Conservation and Development



Mr. Daizaburo KURODA
Leader
Preparatory Study Team
Japan International Cooperation Agency

In response to the request of the Government of the Kingdom of Saudi Arabia (hereinafter referred to as "the Government of Saudi Arabia"), the Preparatory Study Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Daizaburo KURODA, was dispatched to Saudi Arabia from November 23th, 1996 to December 13th, 1996 to discuss the scope of the Study on Coastal/Marine Habitat and Biological Inventories in the Northern part of the Red Sea Coast in the Kingdom of Saudi Arabia (hereinafter referred to as "the Study").

The Team carried out field surveys and held a series of discussion with the officials concerned of the National Commission for Wildlife Conservation and Development (hereinafter referred to as "NCWCD"). The list of attendants is shown in Appendix 1.

As a result of discussions, both sides agreed to the following:

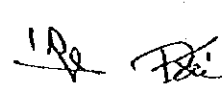
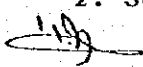
1. Overall project plan by NCWCD

NCWCD explained the overall project plan for nature conservation in the Red Sea coast as follows;

At first, the result of the existing surveys will be reviewed. Then, based on the present natural and socio-economic conditions, proposed protected areas in the past will be revised and newly selected. At last they will make a plan for the protection and management of the newly proposed protected areas.

Both sides agreed that the Japanese cooperation will cover a part of the NCWCD plan including making habitat maps in the northern part of the Red Sea coast and conducting a detail survey in a specific area as a model of the survey.

2. Scheme of Development Study



The Team explained the scheme of "the Development Study" conducted as Japan's ODA by JICA and NCWCD understood the scheme.

3. Draft Scope of Work

As a preliminary plan of the scope of the Study, the Draft Scope of Work (See Appendix 2. hereinafter referred to as "the Draft S/W") was prepared and both sides discussed the Draft S/W as follows:

(1) Title of the Study;

Both sides agreed that the title of the Study is same as the Draft S/W.

(2) Objectives of the Study;

Both sides agreed that the objectives of the Study is same as the Draft S/W.

(3) Study Area;

Both sides agreed that the Study Area is north of Jeddah covering the latitudes between 22°N and 29°N.

Both sides also agreed that the Study will cover up to fifteen (15) metre depth in the marine area including offshore islands and up to one (1) Kilometre width inland from the shore in the coastal area.

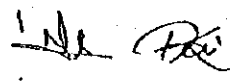
(4) Scope of the Study;

Both sides agreed that the Scope of the Study is same as the Draft S/W. NCWCD requested the Team that the cost of the aerial photos (the specifications are shown in Appendix 3) will be paid by JICA.

The Team explained that the Study in the above case may be conducted based on the tentative work plan in Appendix 4.

(5) Output of the Study

Both sides agreed that the biological inventories, habitat maps of 1/100,000 scale and GIS data-base, which



is installed to the existing system, will be submitted as the output of the Study.

Both sides also realized that they should prepare specimens which are collected during the course of field survey. These will be useful for research and public awareness, and should be returned to NCWCD along with the Final Report. The Japanese Study team may keep half of the duplicate specimen.

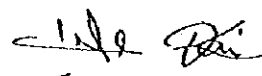
(6) Alternative course of the Study

NCWCD expressed that they will inform JICA whether the aerial photos can be provided or not by the end of January, 1997. Both sides agreed that they should discuss the alternative course of the Study and that the Scope of the Study and the Output should be revised in case that the aerial photos are not available.

(7) Undertaking of the Government of Saudi Arabia

Both sides agreed that undertaking of the Government of Saudi Arabia is basically same as in the Draft S/W, and NCWCD expressed that it will try to secure necessary permissions. Besides, for the smooth conduct of the field survey, the Team requested the following to NCWCD. NCWCD expressed to take the necessary measures as much as possible and requested the Team to propose the detailed Study plan for its arrangement.

- a) To arrange necessary permissions and to be accompanied by counterpart personnel during the study in Saudi Arabia.
- b) To keep cooperation for the Study with the Coast Guard and other related agencies.
- c) To assist the Study Team to secure their accommodation and survey assistants, if necessary.
- d) To provide a driver for the vehicle prepared by JICA.
- e) To arrange the aerial survey.
- f) To collaborate with the Japanese Study team in identifying the species and preparing specimen.



- g) To arrange permissions to tentatively take the maps of 1/250,000 scale and 1/50,000 scale, charts of 1/50,000 scale, aerial photos, and specimen out of Saudi Arabia to Japan.
- h) To take necessary measures for the emergency like an accident in the Study Area.

4. General conditions

(1) Both sides agreed that any scientific publication resulting from the Study by any member of the Study team should have prior permission from both JICA and NCWCD.

(2) NCWCD requested that the Japanese Study team must respect and observe the laws, regulations and local customs of the Kingdom of Saudi Arabia and the Team accepted it.

1.11.92

LIST OF ATTENDANTS

I. National Commission for Wildlife Conservation and Development (NCWCD)

1. Secretary General

1) HE. Prof. Dr. Abdulaziz H. Abu-Zinada

2. General Directorate of Studies and Research

2) Mr. Yousef I. A. Al-Wetaid Acting General Director

3. Directorate of Marine Research

3) Mr. Omar A. Khushaim Director

4) Dr. Ahmad M. Al-Mansi Marine Environmentologist

4. Directorate of Protected Area Planning

5) Mr. Mohammad S. Sulayem Director

6) Mr. Othman A. Llewellyn Environmental Planner

5. Scientific Research Working Teams Coordination Unit

7) Dr. Iyad A. Nader

6. Japanese Expert

8) Mr. Chiharu Miyamoto

II. The Preparatory Study Team of the Japan International Cooperation Agency

1) Mr. Daizaburo Kuroda Leader

2) Mr. Kenji Seiyama Member

3) Mr. Koji Fujiya Member

4) Mr. Hisae Tokumaru Member

5) Mr. Hiroshi Fukao Member

6) Mr. Takeshi Wakamatsu Member

7) Mr. Ken Usui Member

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(DRAFT)
THE SCOPE OF WORK
FOR
THE STUDY
ON
COASTAL/MARINE HABITAT AND BIOLOGICAL INVENTORIES
IN
THE NORTHERN PART
OF
THE RED SEA COAST
IN
THE KINGDOM OF SAUDI ARABIA

AGREED UPON BETWEEN

NATIONAL COMMISSION FOR
WILDLIFE CONSERVATION AND DEVELOPMENT
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

RIYADH,

National Commission for
Wildlife Conservation and Development

Japan International Cooperation Agency

102 *PK*

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Saudi Arabia (hereinafter referred to as "the Government of Saudi Arabia"), the Government of Japan decided to conduct the Study on Coastal/Marine Habitat and Biological Inventories in the Northern Part of the Red Sea Coast in the Kingdom of Saudi Arabia (hereinafter referred to as "the Study"), with the general framework of technical cooperation between Japan and Saudi Arabia, which is set forth in the Agreement on Economic and Technical Cooperation between the Government of Japan and the Government of Saudi Arabia signed on March 1, 1975.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Saudi Arabia.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to conduct a basic inventory survey on the coastal and marine habitat and biota in the northern part of the Red Sea coast in order to supply basic information for the conservation and appropriate management of the natural environment and its biological diversity, and
2. to carry out technology transfer for survey method to the Saudi counterpart personnel in the course of the Study.



III. STUDY AREA

The Study shall cover the northern part of the Red Sea coast of approximately 1,000Km (excluding the coastal area of Jeddah city).

IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Japanese Study Team (hereinafter referred to as "the Study Team") will conduct the Study which shall cover the following:

1. Collection and review of existing data and information
 - (1) Biological reports
 - (2) Meteorological and oceanographical data
 - (3) Socio-economic data (population, land use, fishery, etc.)
 - (4) Topographic maps, charts and aerial photographs
2. Classification of coastal and marine habitat
 - (1) Recognition of habitat from aerial photos
 - (2) Field survey by spot method for distinction of habitat
 - (3) Analysis of distribution of major vertebrates
 - (4) Analysis of human activities impact from socio-economic data
3. Model survey on habitat structure and biota in a specific area
 - (1) Selection of a model survey area
 - (2) Field survey for distinction of habitat in the whole zone
 - (3) Field survey by belt-transect method, etc., for analysis of habitat structure and biota
 - (4) Collecting of specimen
4. Compilation of inventories
 - (1) Habitat maps

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- (2) Biological inventory
- (3) Integration of the results into GIS

V. STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative schedule.

VI. REPORTS

JICA will prepare and submit the following reports in English according to the attached tentative schedule.

1. Inception Report:

Twenty (20) copies at the beginning of the work in Saudi Arabia.

2. Progress Report (1):

Twenty (20) copies at the end of the second work in Saudi Arabia.

3. Interim Report:

Twenty (20) copies at the beginning of the third work in Saudi Arabia.

4. Progress Report (2):

Twenty (20) copies at the end of the fifth work in Saudi Arabia.

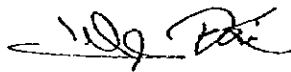
5. Draft Final Report:

Thirty (30) copies at the beginning of the sixth work in Saudi Arabia.

The Government of Saudi Arabia will present its comments to JICA within one (1) month after the receipt of the Draft Final Report.

6. Final Report

Fifty (50) copies within one (1) month after JICA's

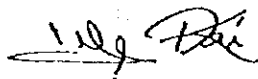


receipt of the comments on the Draft Final Report.

VII. UNDERTAKING OF THE GOVERNMENT OF SAUDI ARABIA

1. To facilitate smooth conduct of the Study, the Government of Saudi Arabia shall take the following necessary measures;

- (1) to secure the safety of the Study Team in Saudi Arabia,
- (2) to permit the members of the Study Team to enter, leave and sojourn in Saudi Arabia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
- (3) to exempt the members of the Study Team from taxes, duties and any charges on equipment, machinery and other materials brought into and out of Saudi Arabia for the conduct of the Study,
- (4) to exempt any members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members for their services in connection with the implementation of the Study,
- (5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into Saudi Arabia from Japan in connection with the implementation of the Study,
- (6) to secure permission as far as possible for entry into private properties or restricted areas for the implementation of the Study,
- (7) to secure permission for the Study Team to take all data, documents and necessary materials (including maps and photographs) related to the Study out of Saudi



Arabia to Japan, and

(8) to provide medical services as needed. Its expenses will be chargeable on members of the Study Team.

2. The Government of Saudi Arabia shall bear claims, if any arise, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Study Team.

3. The National Commission for Wildlife Conservation and Development (hereinafter referred to as "NCWCD") shall act as the counterpart to the Study Team and also as the coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

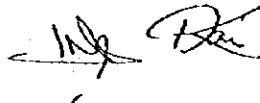
4. NCWCD shall, at its own expense, provide the Study Team with the following, in cooperation with other organization concerned:

- (1) available data and information related to the Study,
- (2) counterpart personnel,
- (3) suitable work spaces with necessary equipment in Riyadh and the Study Area,
- (4) credentials or identification cards, and
- (5) necessary number of vehicles with drivers and boats with crew for field survey.

VIII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, the Study Team to Saudi Arabia,



2. to pursue technology transfer to the Saudi counterpart personnel in the course of the Study.

IX. OTHERS

JICA and NCWCD shall consult with each other in respect to any matter that may arise from or in connection with the Study.

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TENTATIVE STUDY SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
WORK IN SAUDI ARABIA	<div></div>						<div></div>			<div></div>		<div></div>				<div></div>		<div></div>								
WORK IN JAPAN	<div></div>			<div></div>				<div></div>		<div></div>					<div></div>		<div></div>		<div></div>							
REPORT	Δ	IC/R					Δ	P/R(1)		Δ	IT/R							Δ	P/R(2)			Δ	DF/R		Δ	F/R

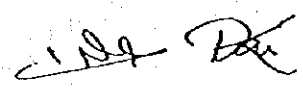
IC/R : Inception Report

P/R : Progress Report

IT/R : Interim Report

DF/R : Draft Final Report

F/R : Final Report



Specification of the needed aerial photos

The aerial photos will be used to recognize the general conditions of the marine habitat in the sea and the coastal area, and the requirement are as follows:

1. Scale;
1/5,000.
2. Color;
color photos.
3. Overlap and sidelap;
approxximately 10 %.
3. Season of photographing;
May or June is preferable because of the convenience for observation of the sea grass by photos.
4. Time of photographing;
During 10:00 and 14:00 is preferable because of without reflection of sun.
5. Weather conditions;
The day with cloud free, little wind and calm seawater surface is preferable. The water should be clear.
6. Other conditions;
The date, the position, and the height of photographing should be recorded with the photos.

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TENTATIVE WORK PLAN OF THE STUDY

STEP I

Collection and review of the existing data and information

- Biological reports
- Meteorological and oceanographical data
- Socio-economic data
- Topographic maps and charts
- Aerial photos

↓

STEP II

Classification and mapping of coastal and marine habitat

- Recognition of habitat from aerial photos
- Field survey by spot method for distinction of habitat
- Analysis of distribution of major vertebrates from existing data
- Analysis of human activities impact from socio-economic data
- Mapping of habitat

↓

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STEP III

Model survey on habitat structure and biota in a specific area

- Selection of an area for the model survey
- Field survey for distinction of habitat in the whole zone
- Field survey by belt-transect method, etc., for analysis of habitat structure and biota
- Collecting of specimen
- Detailed mapping of habitat

→

STEP IV

Integration of the results into GIS

- Digitizing of the habitat maps
- Integration of biological information
- Data-base installation into the existing GIS

↓

Output

- | | |
|--------------------|-----------------------|
| •Habitat maps | •Biological inventory |
| •Data-base for GIS | •Collected specimen |

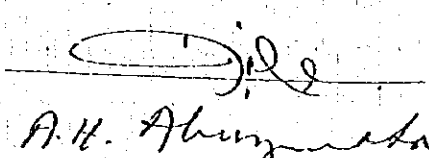
付属資料 3. 実施細則 (S/W)

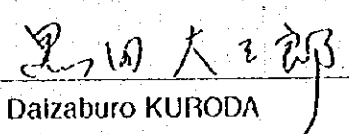
THE SCOPE OF WORK
FOR
THE STUDY
ON
COASTAL/MARINE HABITAT AND BIOLOGICAL INVENTORIES
IN
THE NORTHERN PART
OF
THE RED SEA COAST
IN
THE KINGDOM OF SAUDI ARABIA

AGREED UPON BETWEEN

NATIONAL COMMISSION FOR
WILDLIFE CONSERVATION AND DEVELOPMENT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

RIYADH
March 24, 1997


A.H. Abdulaziz H. Abu-Zinada
Secretary General
National Commission for
Wildlife Conservation and Development


Mr. Daizaburo KURODA
Leader
Preparatory Study Team
Japan International Cooperation
Agency

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Saudi Arabia (hereinafter referred to as "the Government of Saudi Arabia"), the Government of Japan has decided to conduct the Study on Coastal/Marine Habitats and Biological Inventories in the Northern Part of the Red Sea Coast in the Kingdom of Saudi Arabia (hereinafter referred to as "the Study"), within the general framework of technical cooperation between Japan and Saudi Arabia, which is set forth in the Agreement on Economic and Technical Cooperation between the Government of Japan and the Government of Saudi Arabia signed on March 1, 1975.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for implementation of the technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with the authorities concerned of the Government of Saudi Arabia.

The present document sets forth the Scope of Work with regard to the Study.

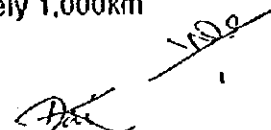
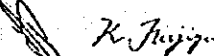
II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to conduct a basic inventory survey on the coastal and marine habitat and biota in the northern part of the Red Sea coast in order to supply basic information for the conservation and appropriate management of the natural environment and its biological diversity, and
2. to carry out technology transfer for survey method to the Saudi counterpart personnel in the course of the Study.

III. STUDY AREA

The Study shall cover the northern part of the Red Sea coast of approximately 1,000km



(excluding the coastal area of Jeddah city).


IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Japanese Study Team (hereinafter referred to as "the Study Team") will conduct the Study which shall cover the following:

1. Collection and review of existing data and information
 - (1) Biological reports
 - (2) Meteorological and oceanographical data
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 - (4) Collecting of specimen
4. Compilation of Inventories
 - (1) Habitat maps
 - (2) Biological inventory
 - (3) Integration of the results into GIS

V. STUDY SCHEDULE

The study will be carried out in accordance with the attached tentative schedule.



K. Fujie



D. A. S.

VI. REPORTS

JICA will prepare and submit the following reports in English according to the attached tentative schedule.

1. Inception Report:

Twenty(20) copies at the beginning of the work in Saudi Arabia.

2. Progress Report(1):

Twenty(20) copies at the end of the first work in Saudi Arabia.

3. Progress Report(2):

Twenty(20) copies at the end of the second work in Saudi Arabia.

4. Interim Report

Twenty(20) copies at the beginning of the third work in Saudi Arabia.

5. Progress Report(3):

Twenty(20) copies at the end of the third work in Saudi Arabia.

6. Progress Report(4):

Twenty(20) copies at the end of the fourth work in Saudi Arabia.

7. Draft Final Report:

Thirty(30) copies at the beginning of the fifth work period in Saudi Arabia.

The Government of Saudi Arabia will present its comments to JICA within one(1) month after the receipt of the Draft Final Report.

8. Final Report:

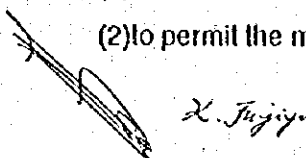
Fifty(50) copies within one(1) month after JICA's receipt of the said comments on the Draft Final Report.

VII. UNDERTAKINGS OF THE GOVERNMENT OF SAUDI ARABIA

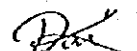
1. To facilitate the smooth conduct of the Study, the Government of Saudi Arabia shall take the following necessary measures:

(1) to secure the safety of the Study Team in Saudi Arabia,

(2) to permit the members of the Study Team to enter, leave and sojourn in Saudi Arabia



H. Fujita



D. K. Singh

for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) to exempt the members of the Study Team from taxes, duties, fees and any charges on equipment, machinery and other materials brought into and out of Saudi Arabia for the conduct of the Study,

(4) to exempt any members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members for their services in connection with the implementation of the Study,

(5) to provide necessary facilities to the Study Team for remittances as well as utilization of the funds introduced into Saudi Arabia from Japan in connection with the implementation of the Study,

(6) to secure permission as far as possible for entry into private properties or restricted areas for the implementation of the Study,

(7) to secure permission for the Study Team to take all data, documents and necessary materials (including maps and photographs) related to the Study out of Saudi Arabia to Japan, and

(8) to provide medical services as needed. Its expenses will be chargeable on members of the Study Team.

2. The Government of Saudi Arabia shall bear claims, if any arises, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Study Team.

3. The National Commission for Wildlife Conservation and Development (hereinafter referred to as "NCWCD") shall act as the counterpart agency to the Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. The NCWCD shall, at its own expense, provide the Study Team with the following, in cooperation with other organizations concerned:

A. J. J.

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- (1) available data and information related to the Study,
- (2) counterpart personnel and their travel expenses for field survey,
- (3) suitable office space with necessary equipment in Riyadh and the Study Area,
- (4) credentials or identification cards, and
- (5) necessary number of vehicles with drivers and boat with crew for field survey.

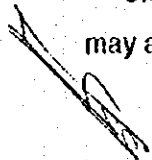
VIII. UNDERTAKINGS OF JICA

For the implementation of Study, JICA shall take the following measures;

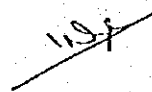
1. to dispatch, at its own expense, the Study Team to Saudi Arabia; and
2. to pursue technology transfer to the Saudi counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA and the NCWCD shall consult with each other with respect to any matter that may arise from or in connection with the Study.



A. Fujita



TENTATIVE STUDY SCHEDULE

APPENDIX

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
WORK IN SAUDI ARABIA																									
WORK IN JAPAN																									
REPORT	ICR	▲	▲	P/R(1)		▲	▲	P/R(2)	▲	▲	IT/R		▲	P/R(3)		▲	P/R(4)		▲	DE/R	▲	▲	F/R	▲	▲

ICR : Inception Report
P/R : Progress Report
IT/R : Interim Report
DE/R : Draft Final Report
F/R : Final Report

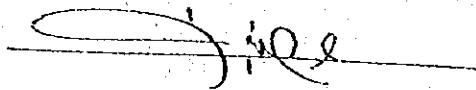
付属資料4. 実施細則に係る協議議事録 (M/M)

MINUTES OF MEETING
ON
THE SCOPE OF WORK
FOR
THE STUDY
ON
COASTAL/MARINE HABITAT AND BIOLOGICAL INVENTORIES
IN
THE NORTHERN PART
OF
THE RED SEA COAST
IN
THE KINGDOM OF SAUDI ARABIA


AGREED UPON BETWEEN

NATIONAL COMMISSION FOR
WILDLIFE CONSERVATION AND DEVELOPMENT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

RIYADH
March 24, 1997



HE. Prof. Dr. Abdulaziz H. Abu-Zinada
Secretary General
National Commission for
Wildlife Conservation and Development



Mr. Dalzaburo KURODA
Leader
Preparatory Study Team
Japan International Cooperation
Agency

In response to the request of the Government of the Kingdom of Saudi Arabia (hereinafter referred to as "the Government of Saudi Arabia"), the Preparatory Study Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Daizaburo KURODA, visited Saudi Arabia from March 17 to March 24, 1997 to discuss the Scope of Work (hereinafter referred to as "S/W") for the Study on Coastal/Marine Habitat and Biological Inventories in the Northern Part of the Red Sea Coast in the Kingdom of Saudi Arabia (hereinafter referred to as "the Study").

The Team held a series of discussions with the authorities concerned of National Commission for Wildlife Conservation and Development (hereinafter referred to as "NCWCD") and other relevant organizations.

The list of attendants is shown in Appendix I.

The draft S/W proposed by the Team was discussed in detail between NCWCD and the Team, and both sides agreed to adopt the S/W with the following understandings.

1. Overall project plan by NCWCD

Both sides confirmed NCWCD's overall project plan for natural conservation in the Red Sea coast and the position of Japanese cooperation in the plan as written in the Minutes of Meeting signed on December 4, 1996 (hereinafter referred to as "M/M of Dec. 4"), as follows.

1. Overall project plan by NCWCD


NCWCD explained the overall project plan for nature conservation in the Red Sea coast as follows;

At first, the result of the existing surveys will be reviewed. Then, based on the present natural and socio-economic conditions, proposed protected areas in the past will be revised and newly selected. At last they will make a plan for the protection and management of the newly proposed protected areas.

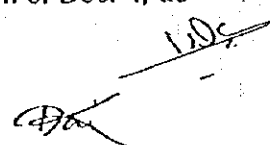
Both sides agreed that the Japanese cooperation will cover a part of the NCWCD plan including making habitat maps in the northern part of the Red Sea coast and conducting a detail survey in a specific area as a model of the survey.

2. Study area

Both sides agreed the coverage of the Study area as written in M/M of Dec. 4, as follows.



L. Fujita



L.D.

3. (3) Study Area;

Both sides agreed that the Study Area is north of Jeddah covering the latitudes between 22° N and 29° N.

Both sides also agreed that the Study will cover up to fifteen (15) metre depth in the marine area including offshore islands and up to one (1) kilometre width inland from the shore in the coastal area.

3. Aerial photo

The Team requested NCWCD to prepare aerial photos with the specifications mentioned in Appendix II. NCWCD asked the Ministry of Petroleum to take the aerial photos. NCWCD explained that the Ministry of Petroleum would inform of the cost estimates in a few weeks. NCWCD, however, requested the Team to consider the cost sharing in case NCWCD and/or the Ministry of Petroleum would find it very difficult to bear all the cost. The Team explained that the cost of such aerial photos should be borne in principle by the Government of Saudi Arabia.

4. Draft work plan of coastal survey

The Team explained the draft work plan of coastal survey as follows and NCWCD basically agreed it.

(1) steps of the Study

Both sides agreed the steps of the Study as in Appendix 4 of M/M of Dec. 4, as attached.

(2) the Japanese Study Team

The Japanese Study Team (hereinafter referred to as "the Study Team") will consist of about eight (8) to ten (10) members, specialized in the following fields: coral, benthos, fish, dugong/turtle, bird, seagrass/seaweed, vegetation, aerial photo analysis, and GIS.

(3) field station

A fixed field station will not be needed during Step I and Step II. In Step III, a fixed field station have to be secured close to a selected area for model survey.

(4) transportation and communication measures

a) vehicles: Maximum five (5) four-wheel-drive (4WD) vehicles for the field survey will be prepared by NCWCD.

b) boats: One (1) rubber boat with an outboard engine and two (2) small boats with

outboard engine(s) suitable for coastal survey will be prepared by NCWCD. Larger boats of Coast Guard will be useful for offshore survey, if available.

c) airplane: An airplane of NCWCD will be used for dugong/turtle/bird observation and aerial survey in the area outside the coverage of the aerial photos.

d) transceiver: One (1) set of transceiver (VHF) will be recommendable to carry for the Study Team for effective communication, if permitted.

(5) counterpart personnel (C/P)

In Step I, C/P will guide the Study Team for their site reconnaissance. Four (4) tidal meters will be installed by the Study Team jointly with C/P, and will be maintained by C/P.

In Step II, C/P will work with the Study Team to obtain field survey technique. A total of ca. 100 survey points (10 m × 10 m) will be selected for underwater observation in coral reef, seagrass bed, mangrove and tidal flat area. Site survey by boat and airplane will be also conducted.

In Step III, more detailed field survey will be conducted at a selected area for model survey. It will include transect survey and simple social study through interview. C/P will work with the Study Team for technology transfer.

(6) accommodation

The accommodation for the Study Team and C/P will be arranged by NCWCD during the field survey. The Study Team will pay for their own accommodation and living expenses.

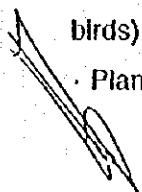
5. Planed output

Both sides agreed that planed output of the Study would be following four (4) contents.

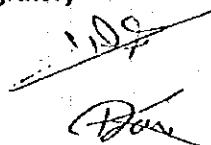
(1) biological inventory

The following animals and plants will be included in the biological inventory.

- Invertebrates: corals, mollusks, crustaceans, echinoderms and other major invertebrates
- Vertebrates: fishes, dugong, dolphins, turtles and birds (including migratory birds)
- Plants: seagrass, macro algae, mangrove and terrestrial plants



K. F. J. J.



The animals and plants will be identified at "species" level principally, but in case of difficulty in identification at species level, it will be classified at "genus" or "family" level.

(2) habitat maps

The scale of the habitat maps is 1/100,000. The base maps of the habitat map will be produced by topographical maps of 1/50,000 and nautical charts of 1/50,000.

Following classified zones will be designated in the map.

a) marine habitat: coral reef, algal bed, algal reef, seagrass bed, rock, sand, mud

b) hinterland habitat: mangrove, sabkha, salt marsh, desert and others

The classification of the marine and hinterland habitat will be based on (a) aerial photos, (b) existing data and documents, and (c) results of the site survey.

(3) GIS database

The data for GIS will be extracted from the habitat maps and results of the site survey. Two (2) sets of GIS database will be submitted together with the Final Report. A personal computer is recommendable for smooth use of GIS database provided by the Study Team.

(4) biological specimen

Biological specimen will be identified, prepared, and preserved as collaborative work of both sides as in M/M of Dec. 4, Paragraph 3. (5) and 3. (7) 1), as follows.

3. (5) Output of the Study

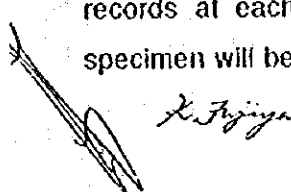
Both sides also realized that they should prepare specimen which are collected during the course of field survey. These will be useful for research and public awareness, and should be returned to NCWCD along with the Final Report. The Japanese Study Team may keep half of the duplicate specimen.

3. (7) Undertaking of the Government of Saudi Arabia

1) To collaborate with the Japanese Study team in identifying the species and preparing specimen.

6. Final Report

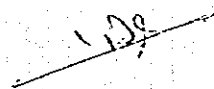
The Final Report will include (a) the biological inventory together with biological records at each survey, and (b) the habitat maps. GIS database and biological specimen will be attached with the Final Report.



K. Fujiya



Dai



J. J. J.

1. Secretary General

2. General Directorate of Studies and Research

Mr. Yousef I. A. Al-Wetald

Acting General Director

3. Directorate of Marine Research

Mr. Omar A. Khushalm

Director

Dr. Ahmad M. Al-Mansi

Marine Environmentologist

4. Directorate of Protected Area Planning

Mr. Mohammad S. Sulayam

Director

5. Information Center

Mr. Abdulaziz M. Al-Mohanna

Director

6. Scientific Research Working Teams Coordination Unit

Dr. Iyad A. Nader

7. Japanese Expert

Mr. Chiharu Miyamoto

II. The Preparatory Study Team of the Japan International Cooperation Agency

Mr. Dalzaburo Kuroda

Leader

Dr. Shigeru Shimura

Member

Mr. Koji Fujiya

Member

Mr. Kazuhiro Shibayama

Member

A. Fujiga

Specifications for Vertical Aerial Photography

1. Type of photography : The 1:10,000 scale vertical color aerial photography with quality and precision for identification of coastal/marine habitat.
2. Area : The area is indicated on the 1:50,000 nautical charts.
3. Camera
 - (a) RC-30 or equivalent with a calibrated focal length between 150 mm and 155 mm.
 - (b) The camera equipped with GPS to determine the position of exposures.
4. Overlap and sidelap
Fore and all overlap: 20 % (or 60 %) \pm 5 % , sidelap: 20 % \pm 5 %
5. Crab and tilt
 - (a) Crab: Less than 5° from each base line shown on the 1:50,000 nautical charts.
 - (b) Tilt: Less than 2°
6. Conditions of photographic flight
 - (a) Season: February to March, 1998 (flourishing season of seaweed)
 - (b) Weather and marine condition: Less than 3 % of cloud or cloud shadow in the whole frame, no smoke or dust, no turbid sea water after rain, no crest of wave, no halation
7. Aerial film
KODAK Aero Color 2445 or equivalent handled and stored in accordance with the manufacturer's recommendation.
8. Print numbering and annotation
 - (a) Numbering: Flight course number and exposure number of each exposure.
 - (b) Annotation: Data recorded automatically on each negative, e.g., focal length of the lens, date and time of photography, height above sea level, shutter speed, GPS data of the position of the exposure
9. Products to be delivered
 - (a) Contact prints 2 sets
 - (b) Flight index maps 2 sets
 - (c) GPS data list 2 sets
10. Preferable date of delivery: April 1st, 1998

X. Fujige

The Appendix 4 of the Minutes of Meeting on Dec. 4, 1996

TENTATIVE WORK PLAN OF THE STUDY

STEP I

Collection and review of the existing data and information

- Biological reports
- Meteorological and oceanographical data
- Socio-economic data
- Topographic maps and charts
- Aerial photos

↓

STEP II

Classification and mapping of coastal and marine habitat

- Recognition of habitat from aerial photos
- Field survey by spot method for distinction of habitat
- Analysis of distribution of major vertebrates from existing data
- Analysis of human activities impact from socio-economic data
- Mapping of habitat

↓

↓

STEP III

Model survey on habitat structure and biota in a specific area

- Selection of an area for the model survey
- Field survey for distinction of habitat in the whole zone
- Field survey by belt-transect method, etc., for analysis of habitat structure and biota
- Collecting of specimen
- Detailed mapping of habitat

STEP IV

Integration of the results into GIS

- Digitizing of the habitat maps
- Integration of biological information
- Data-base installation into the existing GIS

→

↓

Output

- Habitat maps
- Biological inventory
- Data-base for GIS
- Collected specimen

11/09

[Signature]

R. Fujiga

付属資料5. 主要面会者リスト

5-1 予備調査時主要面会者リスト

(1) 野生生物保護委員会 (NCWCD: National Commission for Wildlife Conservation and Development)

Prof.Dr.Abdulaziz H. Abu-Zinada	General Secretary (次官)
Mr. Yousef I.A. Al-Wetaid	Director General of Research & Studies (調査研究局長)
Mr. Omar A. Khushaim	Director of Marine Research (海洋研究部長)
Mr. Abudullah H. Al-Wetaid	Environmental Consultant (マングローブ担当)
Dr.Ahmad M.Al-Mansi	Marine Environmentologist (海洋環境担当)
Mr. Mostafa Al-Marghani	Marine Biologist (海洋生物担当)
Mr. Mohamed S. Al-Sulayem	Director of Protected Area Planning (保護区計画部長)
Dr. Othman Lolan	Environmental Planner (環境計画担当)
Dr.Iyad A.Nader	Chairman of Scientific Research Working Teams (科学研究作業総括)
Mr.Abdulaziz M.Mohanna	Director of Coordination Unit, Information Center (情報センター調整部長)
Mr.Ali As-Saifi	Chief of Geographic Center (地勢センター主任)
Mr.Chiharu Miyamoto	Japanese Expert (JICA派遣専門家)

(2) 企画省 (Ministry of Planning)

Mohamoud Fayed	Director General (局長)
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(3) キングアブドラージ科学技術都市 (KACST: King Abdulaziz City for Science and Technology)

Dr.Kamel M.Sheikho	Deputy Director of Saudi Center for Remote Sensing (航空測量センター副所長)
--------------------	--

(4) 石油鉱物資源省 (Ministry of Petroleum and Mineral Resources)

Mr.Shosuke Mohri	Japanese Expert (JICA派遣専門家-航空測量)
------------------	----------------------------------

(5) 農業水資源省 (Ministry of National Agriculture and Water Resources)

Dr. Shaukat Ali Chaudhary

National Agriculture and Water Resources Research
Center (国立農業水資源研究センター職員)

(6) 気象環境保全局 (MEPA: Meteorology and environmental Protection Administration)

Prof. Nigar Ibrahim Tawfiq

Vice President (副局長)

(7) 紅海アデン湾地域環境保全機構 (PERSGA: Regional Organization for the Conservation
of the Environment of the Red Sea, Gulf of Aden)

Prof. Nigar Ibrahim Tawfiq

Chairman (総裁)

Dr. William Gladstone

Chief Technical Advisor (主任技術顧問)

Dr. Dirar H. Nasr

Assistant Coordinator (調整員)

(8) キングアブドラージ大学海洋学部 (KAU: King Abdulaziz University, Faculty of
Marine Science)

Dr. Othman Abdu Hashim

Dean (海洋学部長)

Dr. Hisham Khomayis

Vice Dean for High Studies and Research Activities
(副学部長: 修士課程及び研究活動担当)

(9) MBE (Mapping Business Establishment)

Mr. Waleed S. Al-Shehri

(10) ZAKI M.A. FARSI

Mr. Mahmed Al-Jundi

Mr. Heder Khalifa

(11) 在サウディ・アラビア日本大使館

丹波 寛

特命全権大使

西宮 信隆

公使

岩見 洋一

2等書記官

(12) JICAサウディ・アラビア事務所

草野 孝久

所長

涌井 純二

職員

Ihab M.Al-Shargawi

職員

5-2 事前調査時主要面会者リスト

(1) National Commission for Wildlife Conservation and Development (NCWCD)

Secretary General

H.E. Prof. Dr. Abdulaziz H. Abu-Zinada

General Directorate of Studies and Research

Mr. Yousef I. A. Al-Wetaid Acting General Director

Directorate of Marine Research

Mr. Omar A. Khushaim Director

Dr. Ahmad M. Al-Mansi Marine Environmentologist

Director of Protected Area Planning

Mr. Mohammad S. Sulayam Director

Information Center

Mr. Abdulaziz M. Al-Mohanna Director

Scientific Research Working Teams Coordination Unit

Dr. Iyad A. Nader

Japanese Expert

Mr. Chiharu Miyamoto (宮本 千春)

(2) Ministry of Planning

Director General

Mr. Mohamound Fayez

(3) 日本大使館

四宮 信隆 公使

岩見 洋一 2等書記官

付属資料6. 主要収集資料リスト

- 1) NCWCD/IUCN, 1990. A SYSTEM PLAN OF PROTECTED AREAS FOR WINDLIFE CONSERVATION AND SUSTAINABLE RURAL DEVELOPMENT IN SAUDI ARABIA, EXECUTIVE SUMMARY.
- 2) NCWCD/IUCN, 1990. A SYSTEM PLAN OF PROTECTED AREAS FOR WINDLIFE CONSERVATION AND SUSTAINABLE RURAL DEVELOPMENT IN SAUDI ARABIA.
- 3) NCWCD/IUCN, 1990. A SYSTEM PLAN OF PROTECTED AREAS FOR WINDLIFE CONSERVATION AND SUSTAINABLE RURAL DEVELOPMENT IN SAUDI ARABIA, APPENDICES II.
- 4) Miller J.D., 1989. MARINE TURTLES, Volume 1 : An assessment of the conservation status of marine turtles in the Kingdom of Saudi Arabia, Prepared by Dr. Jeffrey Dean Miller, MEPA Coastal and Marine Management Series, Report No. 9.
- 5) Miller J.D., C.J. Limpus and J.P. Loss, 1989. MARINE TURTLES, Volume 2 : Recommendations for the conservation of marine turtles in the Kingdom of Saudi Arabia, Prepared by Dr. Jeffrey Dean Miller, MEPA Coastal and Marine Management Series, Report No. 9.
- 6) Preen A., 1989. DUGONGS, Volume 1 : The status and conservation of dugongs in the Arabian region, MEPA Coastal and Marine Management Series, Report No. 10.
- 7) Preen A., 1989. DUGONGS, Volume 2 : Recommendations for the conservation of dugongs in the Arabian region, MEPA Coastal and Marine Management Series, Report No. 10.
- 8) Ito, T. and R.J. Al-Harbi, 1995. REPORT ON THE PRELIMINARY SURVEY ON INTERTIDAL BIOTOPES IN WAJH BANK, RED SEA, SAUDI ARABIA, NCWCD.
- 9) Pilcher, N., A.R. Nawab and S.G. Oakley, 1990. THE GREEN TURTLE CHELONIA MYDAS AT RAS BARIDI: an initial assessment, NCWCD.

- 10) Pilcher, N., 1992. THE NESTING HABITS OF THE GREEN TURTLE CHELONIA MYDAS AT RAS BARIDI, NCWCD.
- 11) Tatwany H. and M. Al-Merghani, 1996. REVIEW OF THE CONSERVATION STATUS OF MARINE TURTLES IN THE KINGDOM OF SAUDI ARABIA, A report to CMS consultant on Marine turtles, NCWCD.
- 12) Newton, S.F., A.H. Al-Suhaibany, M. Al-Salamah and S. Yahya, 1996. DISTRIBUTION AND ABUNDANCE OF SUMMER BREEDING SEABIRDS IN THE SAUDI ARABIAN RED SEA IN 1996, NCWCD.
- 13) Chiffings, A.W., 1989. A DRAFT PLAN OF ACTION FOR A SYSTEM OF MARINE PROTECTED AREAS FOR WILDLIFE CONSERVATION AND DEVELOPMENT TO SUPPORT SUSTAINABLE RESOURCE USE FOR HUMAN WELFARE IN THE KINGDOM OF SAUDI ARABIA, NCWCD.
- 14) IUCN/MEPA, 1994. ENVIRONMENTAL PROTECTION IN ISLAM, Second Revised Edition, IUCN Environmental Policy and Law Paper No. 20 Rev.
- 15) PERSGA/UNEP/ACOPS/ROPME, 1995. SEA TO SEA Background Papers: Regional Conference on Sustainable Use of the Marine Environment, Jeddah Chamber of Commerce Conference Hall, October 9 - 12, 1995.
- 16) ALESCO/PERSGA/UNESCO, 1990. RED SEA, GULF OF ADEN AND SUEZ CANAL: A Bibliography on Oceanographic and Marine Environmental Research.
- 17) King Abdulaziz University, 1990. THE DEVELOPED CURRICULUMS OF THE FACULTY OF MARINE SCIENCE, Scientific Publitzing Centre, King Abdulaziz University.
- 18) MEPA/IUCN, 1989. RED SEA & ARABIAN GULF, Saudi Arabia: An Assessment of National Coastal Zone Management Requirements.
- 19) MEPA, 1989. THE STATE OF THE ENVIRONMENT IN THE KIGDOM OF SAUDI

ARABIA, VOLUME 2 : Institutional Arrangements.

- 20) ENVIRONMENTAL MANAGEMENT IN SAUDI ARABIA, MEPA. (コピー)
- 21) BROCHURE: RED SEA AND GULF OF ADEN ENVIRONMENT PROGRAMME, ALECSO.
- 22) THE EXPERIENCE OF THE WORLD BANK IN THE LEGAL, INSTITUTIONAL AND FINANCIAL ASPECTS OF REGIONAL ENVIRONMENT PROGRAMS: Potential Applications of Lessons Learned for the ROPME and PERSGA Programs, August 1996, The World Bank.
- 23) OUR FRAGILE COASTS: The Development and Conservation of Saudi Arabia's Coastal Resources: The Needs for a National Coastal Zone Management Programme, MEPA. (啓蒙用パンフレット)

その他、収集はしなかったが、NCWCD図書室／資料室にある既存関連レポートは次頁のとおりである。また、これら各資料の巻末のBIBLIOGRAPHYも参考文献として有用であろう。

LIST OF MARINE BIOLOGICAL RESEARCH PAPERS

- Abuzinada A.H., Y., 1991. Al-Wetaid and S. Faizi, Towards Restoring the Ecological Viability of the Marine Life in the Gulf, NCWCD
- Abuzinada, A.H. and F. Krupp, 1994. The Status of Coastal and Marine Habitats Two Years after the Gulf Oil Spill, CFS.
- Al-Mansi, A., O. Khushaim and M. Al-Marghais, 1996. Distribution of Oil From the War Oil Spill within Intertidal Habitats - five Years later, NCWCD
- Braun, N., 1995. Oil Spill Wildlife Rescue Programme, Jubail Marine Wildlife Sanctuary.
- CEC/NCWCD, 1992. Establishment of a Marine Habitat and Wildlife Sanctuary for the Gulf Region, Interim Report for Phase II.
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- CEC/NCWCD, 1993. Wildlife Sanctuary for the Gulf Region, Final Report Phase 2.
- CEC/NCWCD, 1994. Wildlife Sanctuary for the Gulf Region, Final Report Phase 3.
- Gladstone, W., 1994. The Farasan Marine Protected Area: Biological Resources, Conservation Values, Human Uses and Impacts, NCWCD
- Gladstone, W., 1994. The Farasan Marine Protected Area (Sep. - Dec. 1994): Implementation and Amendments to the Management Plan, NCWCD
- Goldspink, C.R., D. Morgan and H. Tatwany. A Note on the Size and Status of the Farasan Artisanal Fishery, Red Sea, Saudi Arabia Manchester Metropolitan University / NCWCD.
- Heneman, B., 1991. The Gulf War Oil Spills : The ICBP Survey of the Saudi Arabian Gulf Coast, ICBP/NCWCD.
- Ito, T., 1995. Report on Preliminary Survey on Intertidal Zone at Tarut Bay, Arabian Gulf, NCWCD
- Ito, T. and R.J. Al-Harbi, 1995. Report on Preliminary Survey on Intertidal Biotopes in Waji Bank, Red Sea, Saudi Arabia, NCWCD.
- IUCN, 1993. Marine and Coastal Areas Programme - Review and Evaluation.
- Johannes, R.E., 1990. Knowledge on the Marine Environment Possessed by Fishermen on the Farasan Islands, Southern Red Sea.
- Kanno, T., 1996. Report on a Trip of Farasan Island and Southern Part of the Red Sea Side, NCWCD.
- MEPA/IUCN, 1984. Saudi Arabia Marine Conservation Programme, Report No. 5: Management of Red Sea Coastal Resources - Recommendations for Protected Area.
- MEPA/IUCN. Saudi Arabia Marine Conservation Programme, Informal Report No. 9: Status Report on Observations at Detailed Study Sites.
- MEPA/IUCN. Saudi Arabia Marine Conservation Programme, Informal Report No. 10: Data from Detailed Study Sites.
- MEPA/IUCN, 1987. Saudi Arabia Marine Conservation Programme, Supplementary Volume I: Papers published in or submitted to scientific journals.

- MEPA/IUCN, 1987. Saudi Arabia Marine Conservation Programme, Supplementary Volume II: Graduate Report 1. Distribution and Community Ecology of Red Sea Coral reef Fishes.
- MEPA/IUCN, 1987. Saudi Arabia Marine Conservation Programme, Supplementary Volume III: Graduate Report 2. Computer Models of Key Food Chains in a Coral Reef Ecosystem.
- MEPA/IUCN, 1987. Saudi Arabia Marine Conservation Programme, Supplementary Volume IV: Graduate Report 3. Species Distribution and Theoretical Aspects of Red Sea Coral Reefs.
- MEPA/IUCN, 1987. Saudi Arabia Marine Conservation Programme, Supplementary Volume V: Graduate Report 4. Ecological and Behavioural Studies on Selected Fish Species within the Saudi Arabian Red Sea.
- Miyamoto, C. and A.H. Al-Wetaid, 1996. Report of an Inspection of the Status of Coastal Mangal of the Southern Red Sea, NCWCD.
- Miyamoto, C. and A. H. Al-Wetaid, 1993. Report of the 2nd Survey on Mangrove Forests in Farasan Archipelago : An Assessment of Khor Farasan Forest, NCWCD.
- Miyamoto, C. and A.H. Al-Wetaid, 1993. Report of an Assessment on the Degraded Mangrove Forest of Muassem, NCWCD.
- Miyamoto, C. and A.H. Al-Wetaid, 1993. Report of a Visit to the Wildlife Sanctuary for the gulf Region and Khafji, NCWCD.
- Miyamoto, C. and A.H. Al-Wetaid, 1993. Report of a Preliminary Survey on Mangroves in Farasan Islands, NCWCD.
- Miyamoto, C. and A.H. Al-Wetaid, 1993. Report of the 2nd Survey on Mangrove Forests in Farasan Archipelago: An Assessment on Khor Farasan Forest, NCWCD.
- NCWCD, 1989. Wildlife Conservation and Development in Saudi Arabia - Proceedings of the First Symposium, Riyadh, february 1987, Publication No. 3.
- NCWCD/Manchester Metropolitan University, 1993. The Distribution and Status of Seabirds on the Farasan Islands, Red Sea, Saudi Arabia with a note on the possible effects of egg predation (Based on survey conducted between 16 June - 23 July 1993).
- Pilcher, N., 1992. Field Report - Marine Turtle Nesting Season Arabian Gulf.
- Pilcher, N., 1992. The nesting Habits of the Green Turtle *Chelonia mydas* and the hawksbill Turtle *Eretmochelys imbricata* in the Arabian Gulf.
- RATCUFF & ASSOCIATES, INC., 1991. The Arabian Gulf Reef Reclamation Project.
- Research Institute, King Fahd University of Petroleum & Minerals, 1993. Report on Research Vessel - Umitaka Maru Cruise in the ROPME Sea Area.
- Tsuruta, K., The Effects of Environmental Change in Mangroves in Khafji, Al Gurm Research Center.

TAXONOMICAL BOOKS

- Fauna of Saudi Arabia, Vol. 1 - 14, 1979-1994.
- Flora of Saudi Arabia, Vol. 1 - 3, 1988-1990.
- Red Sea Invertebrates (by Dr. Peter Vane), IMMEL, 1986.
- Red Sea Reef Fishes (by Dr. John E. Randall), IMMEL, 1983.

付属資料 7. 資料及び機材関連情報

予備調査団より提示された質問表に対する回答は、先方政府の準備期間が十分でなかったことから正式には得られていない。予備調査を通して聴取または既存資料から判明した関連事項は以下のとおりである。

(1) 統計資料及びデータ (全国レベル)

大蔵国家経済省、自治省、等の関連省庁にて入手可能と考えられる。

(2) 自然保護区の現状

1) 既存自然保護区リスト

国全体の保護区リスト (候補地を含む) は、収集資料 1)、2)、3) に記載。

2) 各保護区における法規

NCWCD は、同国法律 (Royal Decree No. M/22, 1986/6/20 発布) によって要求されている各保護区の管理体制の確立に向けて努力している。

3) 保護管理計画

自然保護区の管理計画は、4 か所の保護区についてのみ作成されているのみであり、海洋保護区としては次の二つがある。実際の管理体制は現在鋭意整備中であり、計画通りの管理には至っていないのが現状である。

① 紅海南部ファラサン諸島海洋保護区

The Farasan Marine Protected Area: Biological Resources, Conservation Values, Human Uses and Impacts, May 1994, NCWCD (Prepared by Dr. W. Gladstone) 参照。

② アラビア湾ジュベイル海洋保護区

Wildlife Sanctuary for the Gulf Region, Final Report, Phase 1 (1992), Phase 2 (1994) and Phase 3 (1996), NCWCD/EC 参照。

4) 他の政府機関との協力体制

保護区の管理にあたっては、コーストガード、地方行政機関等よりロジスティック面での協力を得ている。

5) 監視体制 (研究員、監視員等の派遣数)

紅海南部ファラサン諸島海洋保護区には現在7名の職員が派遣されている。研究員のほとんどは NCWCD 本局または国立ジュベイル自然保護センターに勤務し、必要に応じて出張ベースでモニタリング調査等に従事している。

6) モニタリング調査の現状

不明

7) 各保護区管理のための年間予算

不明

(3) 調査対象地域におけるデータ（紅海北部沿岸域）

1) 社会経済データ

各地域別の人口／産業統計は、大蔵国家経済省、自治省、または農業水資源省にあること。

2) 自然環境

①紅海沿岸生物環境調査レポート（MEPA／IUCN実施）

具体的な調査方法及び結果については、レポート全13巻(Saudi Arabia Marine Conservation Programme)参照。

保護区選定基準、各保護区候補地の概況については、収集資料1)、2)、3)参照。

②地図、写真

本調査にあたり、下記の地図、写真の利用が可能である。

地勢図（縮尺1/250,000及び1/50,000）：

NCWCD：マングローブ分布、底質区分図（1982）：調査地域の約95%分。

海図（縮尺1/50,000）：

国防省：アカバ湾以外（NCWCDにて入手済み）

航空写真（縮尺1/5,000～1/10,000）：

石油鉱物資源省：航空写真（1/8,000）、白黒、23年前に撮影。

国防省：空軍所有の既存写真の有無確認中。

既存GISデータ：

MEPA：陸地／珊瑚礁区分、水深区分（0～10, 10～20, 20～50, 50～100m）

③気象海象データ

気温、風向／風速、降雨量（MEPA所有）：

Waji, Yanbu, Jeddahの観測データ（過去20年分）

潮位（MEPA所有）：

Jeddah, Jizan, Waji, Haqlの4か所にMEPAの自記潮位計あり（現在故障中）。

過去のある一定期間のデータはある。

④生物生態学データ

紅海沿岸における主要動植物種（Key Species）リスト：入手済

主要動植物種の生態的特徴：過去の文献参照

3) 水産関連データ

農業水資源省水産局にて1995年度の統計参照（印刷中）。1994年以前の統計資料はない。

4) 農業／畜産関連データ

農業水資源省経済局により発行されている統計参照。

(4) 関連機関の組織概要

環境関連の行政組織の枠組み、関連組織概要については、収集資料 19 及び 20) 参照。

1) 野生動物保護委員会 (NCWCD)

本文「5-1 野生生物保護委員会の組織概要」参照。

2) 気象及び環境保全庁 (MEPA)

本文「5-2 関連機関との協力体制」参照。職員数約 500 名。

紅海南部の JIZAN に支所を有する。

3) 環境保護調整委員会 (EPCOOM)

収集資料 19 及び 20) 参照。

4) 紅海及びアデン湾地域環境プログラム (PERSGA)

紅海及びアデン湾の環境保全と各国間の政策調整のため設立された地域環境機構で、現在の加盟国は、サウディ・アラビア、ヨルダン、エジプト、スーダン、ソマリア、イエメン、パレスチナの 7 か国 (1997 年にはジブチの加盟が予定) である。詳細は、収集資料 21)、22) 参照。

5) アラビア湾地域海洋環境保護機構 (ROPME)

アラビア湾の環境保全と各国間の政策調整のため設立された地域環境機構で、現在の加盟国は、サウディ・アラビア、UAE、カタール、バハレーン、イラン、イラク、クウェート、オマーンの 8 か国である。詳細は、収集資料 22) 参照。

6) キングアブドラージ大学海洋学部

本文「5-2 関連機関との協力体制」参照。

カリキュラムの詳細は、収集資料 17) 参照。

7) キングアブドラージ科学技術都市 (KACST)

本文「5-2 関連機関との協力体制」参照。

8) ローカルコンサルタント等

環境調査に関するローカルコンサルタントは皆無である。測量、航空写真撮影、地図作成分野では民間企業 (MBE, ARAMCO 等) がいくつかある。

(5) 衛星写真及び既存 GIS の現状

本文「4-4 関連航空写真・衛星写真等」参照。

(6) 法規関連

労働法：コーランの教えに基づいて、政府、各企業で労働規約を定めている。

漁業法：網目制限がある程度で特になし。統計の整備がようやく終わった段階であり、今後漁業資源調査を経て具体的な規制作成を実施する予定。

環境法：基本的にはコーランの教えに基づく。環境政策及び環境法については、収集資料 14) 参照。

(7) 調査行動に係る情報

1) 交通手段

①調査船の手配可能性

コーストガード	：約 10mFRP 甲板型、船外機 225 馬力×2 基掛け	1 隻
(国防省)	約 7mFRP 無甲板型、船外機 40 馬力×2 基掛け	2 隻
キングアブドラージ大学	：約 18mFRP 甲板型トロール漁船	1 隻
	約 12mFRP 甲板型調査船 (要修理)	1 隻
	約 7mFRP 無甲板型船 (船外機付)	2 隻
NCWCD	：約 7mFRP 無甲板型、船外機 40 馬力×2 基掛け	2 隻
その他	：各地の民間漁船 (約 7mFRP 無甲板型船 (船外機付))	多数
ジェッタの民間クルーザー		多数

②飛行機、ヘリコプターの手配可能性

NCWCD	：セスナ機 (4 人乗り)	2 機
国防省	：ヘリコプター (6 人乗り)	

2) 調査拠点

①事務所／実験室

リヤド：NCWCD 本局内 (事務所のみ) に準備可能と考えられる

ヤンブー：ヤンブー及びジュベイル王室委員会との協力のもと、準備可能と考えられる

ジェッタ：キングアブドラージ大学等との協力のもと、準備可能と考えられる

その他地域：コーストガード等との協力のもと、準備可能と考えられる

②宿泊施設

ジェッタ、ヤンブー：民間ホテル多数あり

その他地域：コーストガードの宿泊施設が短期間であれば手配可能

③標本の処理、保管

リヤド：NCWCD 本局内

ヤンブー：ヤンブー及びジュベイル王室委員会の実験室

ジェッダ：キングアブドラーズ大学の実験室

その他地域：コーストガード（保管のみ）

3) 通信手段

①無線：各コーストガードにあり

②電話：主な市街地では通話可能。携帯電話のレンタルあり

4) 調査機材

①潜水用エアーチャージ：ジェッダ及びヤンブーのみ可能（SR.10／タンク）

②標本保存用薬品（ホルマリン、エーテル、他）

リヤド、ジェッダにて購入可能（ただし、NCWCD等を介してのみ購入可）

リヤドではエーテルの調達は不可能

JICA