

オマーン国
鉍工業プロジェクト選定確認調査
報告書

1996年7月

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国際協力事業団
鉍工業開発調査部

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国際協力事業団
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1139183(6)

<オマーン国鉱工業プロジェクト選定確認調査・ムサンダム地域視察>

写真1

ムサンダム地域東南端のDaba地区

(96年6月11日)

オマーン側よりアラブ首長国連邦側を望む。中央に見えるのが国境ゲート。Dabaはひとつの街が2カ国に跨って存在している。アブダビ側の方がインフラ等の整備が進んでいる。



写真2

Daba地区

(96年6月11日)



写真3

Daba地区より半島中央部の山脈を望む

(96年6月11日)

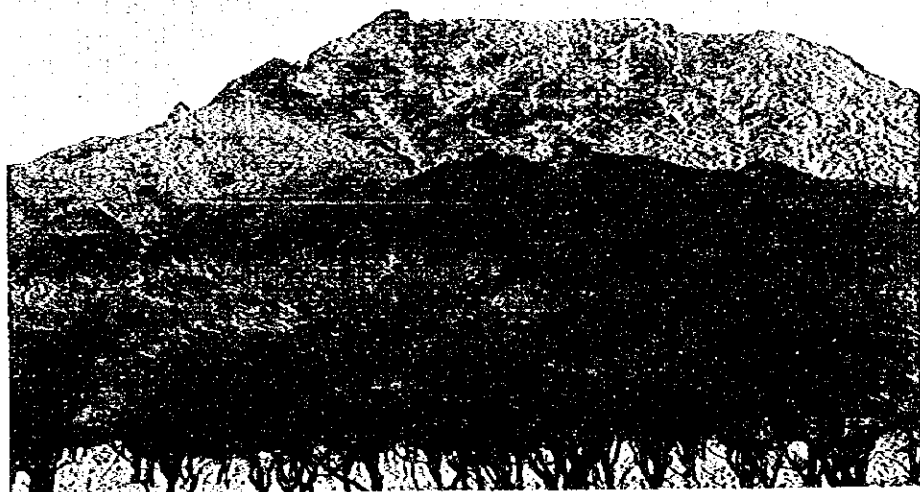




写真4

航空機よりムサンダム
半島を望む (1)

(96年6月11日)

半島中央部



写真5

航空機よりムサンダム
半島を望む (2)

(96年6月11日)

半島の北東より望む



写真6

航空機よりムサンダム
半島を望む (3)

(96年6月11日)

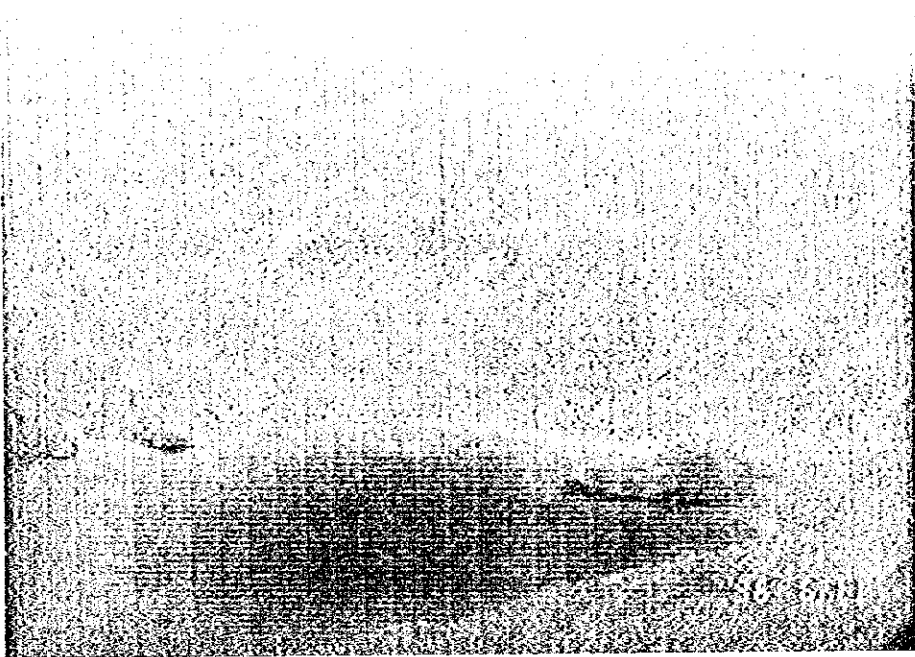


写真7

航空機よりムサンダム
半島を望む(4)
(96年6月11日)

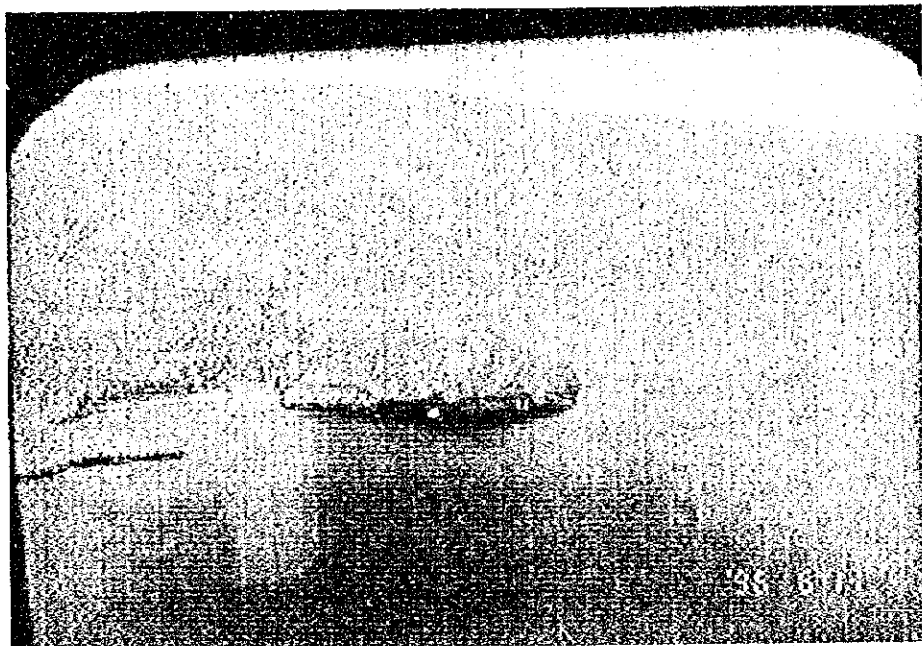


写真8

航空機よりムサンダム
半島を望む(5)
(96年6月11日)
半島の北東より望む



写真9

航空機よりムサンダム
半島を望む(6)
(96年6月11日)
海側よりムサンダム半島の中心地であるハッサブの集落を望む

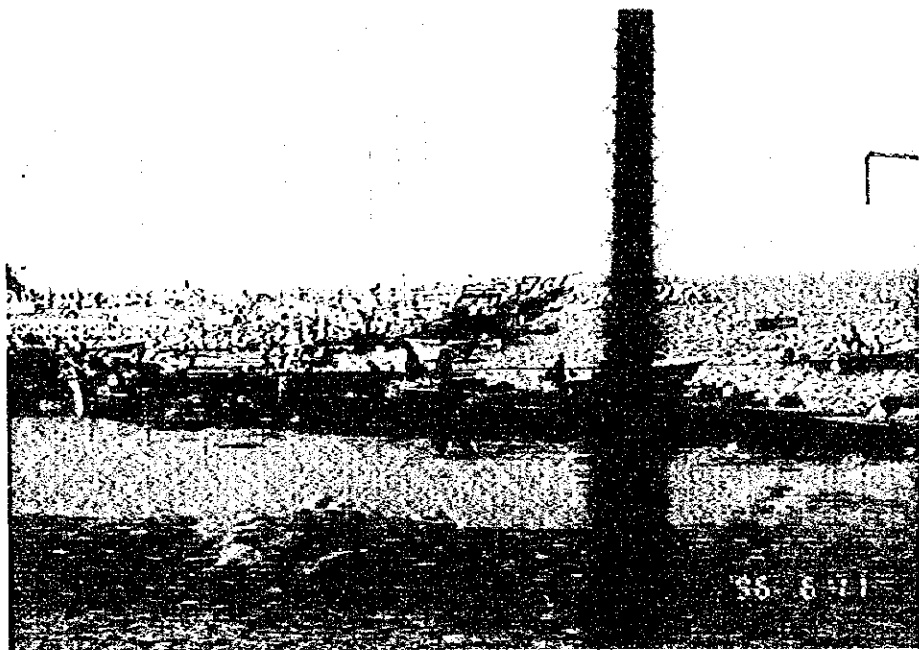


写真10

ハッサブ港

(96年6月11日)
イランへの貿易船(ボート)。
オマーンにとっては合法的な
貿易だがイランとしては不
法取引に当たるといふ。



写真11

ムサンダム半島西岸

(96年6月11日)



写真12

ムサンダム地域からア
ラブ首長国連合へ通じ
る道路

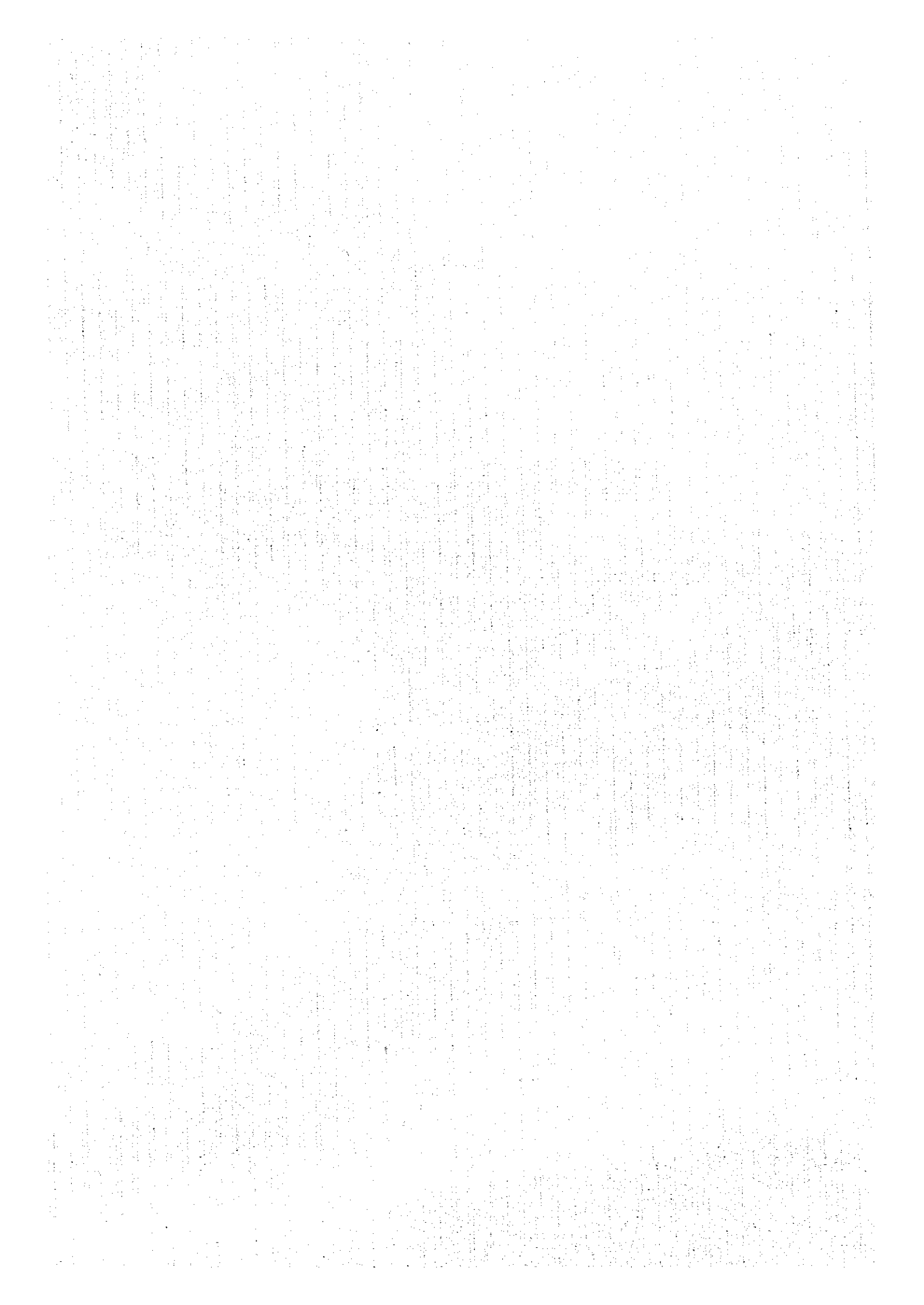
(96年6月11日)
左側(南)がア首連側。現在
舗装工事中であるが道幅も広
く本格的な造成工事を施して
のもの。

オマーン国
鉱工業プロジェクト選定確認調査

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第 1 部 調査結果



1. 調査の目的

鉱工業分野の開発調査を効率的に実施するため、既に我が国に正式要請提出がなされている案件について、その背景・目的、国家開発計画に於ける位置付け及び調査項目等について調査し、今後の我が国の協力の可能性・範囲等を協議した。
尚、今回の調査では、以下の平成8年度要請案件を対象とし、関係機関と協議を行った。

- 1) 電力合理化システム需給管理
- 2) ムサングム地区経済開発
- 3) 地方中小企業振興計画策定
- 4) 石油産業の地下水水質汚染調査

2. 調査の期間

1996年6月7日(金)～6月17日(月) (11日間)

3. 団員構成

| 担当分野 | 団員名 | 所 属 |
|--------|--------|------------------------------|
| 団長・総括 | 藤原 治一郎 | 国際協力事業団鉱工業開発調査部長 |
| 技術協力政策 | 赤松 武 | 外務省経済協力局開発協力課課長補佐 |
| 技術協力行政 | 和泉 章 | 通商産業省通商政策局経済協力部 技術協力課課長補佐 |
| 調査企画 | 澁谷 晃 | 国際協力事業団鉱工業開発調査部計画課 |

4. 調査・協議事項

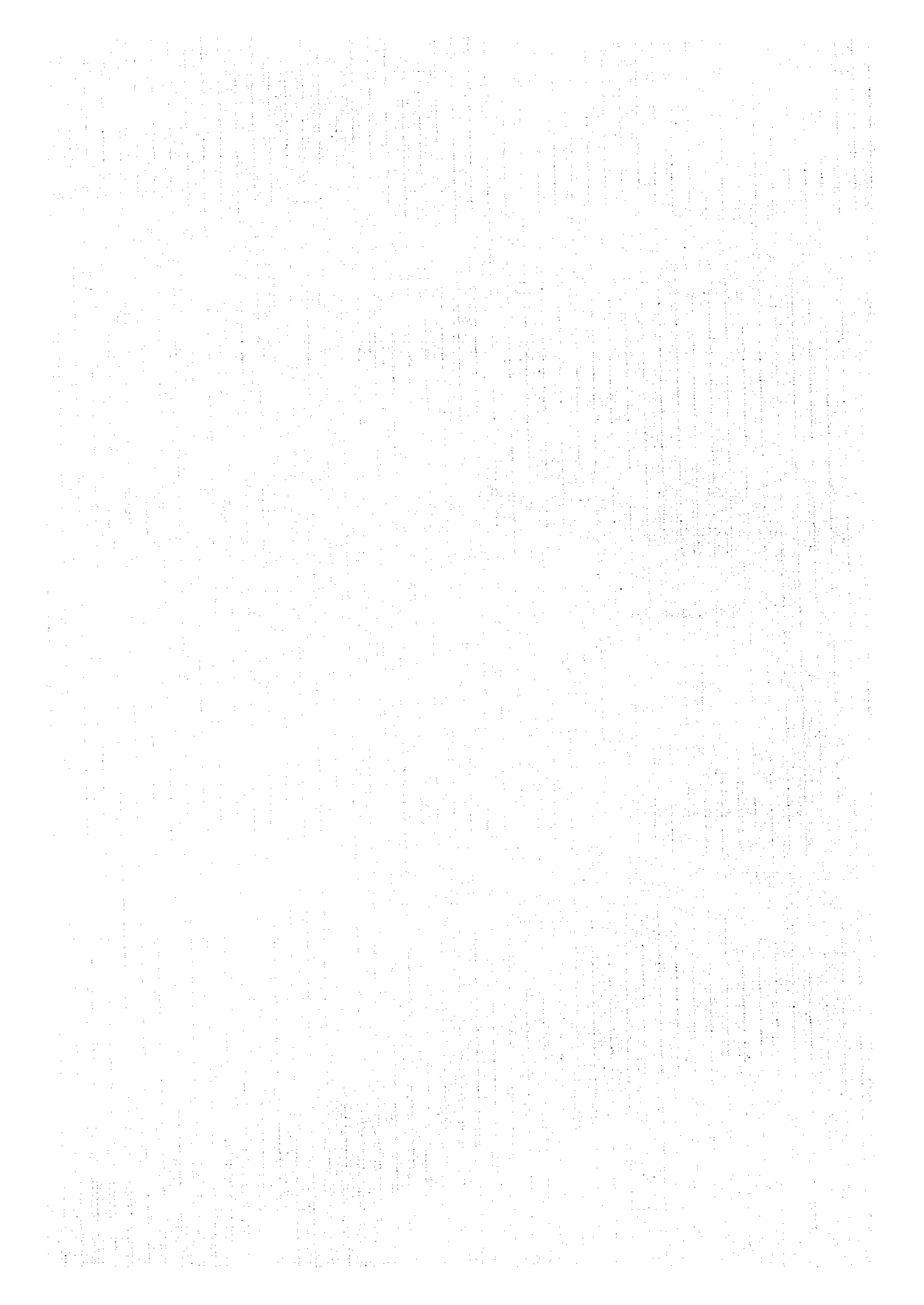
- 1) 要請案件のオマーン側意向聴取(国家開発計画における位置付け、プライオリティ)
- 2) 要請・要望案件の内容確認
- 3) 要請・要望案件の実現見通し(資金手当て、実施体制)の確認
- 4) 国際機関及び他国の協力動向・将来計画
- 5) 我が国の協力の可能性・範囲
- 6) サイト調査(ムサングム地域サイト及びバルカ海水淡水化プラント)
- 7) 関連情報の収集

5. 調査日程

* (#) … 協議番号

| 日順 | 月日 | 曜日 | 行 程 等 | 宿泊地 |
|----|----------------|----|--|-------|
| 1 | 6 / 7 | 金 | 移動 (成田発11:00→(TG641)→バンコク経由→(GF153) →マスカット着21:30) | マスカット |
| 2 | 6 / 8 | 土 | 8:30 日本国大使館表敬及び協議(#1) | マスカット |
| 3 | 6 / 9 | 日 | 8:15 電力水利省表敬及び協議 (電力合理化システム需給 管理) (#2) 11:45 海水淡水化施設視察 (電力合理化システム需給管理) (#3) | マスカット |
| 4 | 6 / 10 | 月 | 8:30 開発省表敬及び協議 (ムサンダム地区経済開発) (#4) 10:30 商工省表敬及び協議 (地方中小企業振興) (#5) 13:00 石油鉱物省協議 (ムサンダム地区経済開発) (#6) | マスカット |
| 5 | 6 / 11 | 火 | 移動 (マスカット発6:30→ハッサブ 着8:25;WT212) 10:30 ムサンダム地方政府表敬・協議 (「ム」地区経済開発) (#7) ムサンダム地域視察1 (DABA、BUKHA) | ハッサブ |
| 6 | 6 / 12 | 水 | ムサンダム地域視察2 (KHASAB) 10:00 ムサンダム地方政府表敬 (「ム」地区経済開発) (#8) 移動 (ハッサブ 発12:50→マスカット着14:20;WT201) | マスカット |
| 7 | 6 / 13 | 木 | ニズワ地方視察 | マスカット |
| 8 | 6 / 14 (休日) | 金 | 資料整理 | マスカット |
| 9 | 6 / 15 | 土 | 8:00 商工省協議 (地方中小企業振興) (#9) 10:00 地方自治環境省協議 (石油産業の地下水水質汚染調査)(#10) 11:00 開発省表敬(#11) | マスカット |
| 10 | 6 / 16 | 日 | 11:30 外務省表敬 (全般) (#12) 12:00 日本国大使館報告 移動 (マスカット発23:15→;TG508) | 機内 |
| 11 | 6 / 17 | 月 | 移動 (→バンコク経由→成田着19:00;TG640) | |

6. 団長所感



6. 団長所感

6. 1 総論

要請案件について、事前に何が問題なのか必ずしも明確でない点が少なくなく、かつたため、本件調査団の訪問に当たってはこれらの点について資料を準備して説明するよう要請していたが、必ずしも十分対応してくれたとは言い難い。これは、

- 1) 開発省が調整窓口としての役割を果たしていないこと
- 2) 開発省を除き各省とも要請案件の作成は外国人アドバイザーに任せているように見受けられ、従って組織として問題化を把握し、対応の方向付けを行うまでに至っていないこと

等によるものと思われる。

このため、要請案件自体が鉱工業開発調査を実施するセクターとして適当なのか、フィージブルなのかあるいは専門家派遣で対応可能なものか等の議論がなされないまま各省から素案のままで提出されていることが判明した。この点については開発省の体制の問題もあるが、現地大使館が案件について協議し、真に必要な優良案件に上げる努力も必要であると思われる。開発省、現地大使館双方に調整機能を高めるよう要請した。また、このような問題はオマーンに限らず他国においても少なからずみられるので、他の国についてもあらゆる訪問の機会を活用して本開発調査の性格、仕組等について現地大使館、JICA事務所に情報提供することが必要であると感じられた。

6. 2 各論

6. 2. 1 電力合理化システム需給管理計画

- 1) 当初の情報では発電と淡水化を同時に行うプラントがシステム的に切り離せないプロセスとなっており、従って電力を中心とするもの水も含めたシステム及び運転改善等が必要と考えられていたが、両分野が必ずしも連動しておらず（淡水化の消費電力はそれほど大きくない）、両分野を分離することは可能であると考えらる。また、需給対策としては、短期的には両分野において逐次増設によって対応しており、緊急の対策を迫られているわけではないことが判明した。
- 2) 従って、水と切り離した上で、電力分野について中長期的に効果が大きいと思われる需給管理システム、ピークロード対策、発電、送配電ロスの削減及び料金制度の確立等について調査対象とする方向で検討すべきと考える。

6. 2. 2 ムサンダム地域開発計画

- 1) 要請では、鉱工業に限らず広範な分野での開発の可能性を調査することが求められていたが、鉱工業分野での開発可能性を検討するため現地視察も行った。開発省・カミース担当課長も同行し、オマーン政府側の熱意と期待は強く感じられたものの、鉱工業分野においてはまず、a) 鉱業については既に地質調査が終了しており全く可能性が無いこと、b) 工業分野においても労働力、利用可能資源に乏しく、港湾等のインフラが未整備であること、c) 全く新たに流通加工基地を整備することについても、ドバイで既にFTZが整備され、中近東全域への供給を目的とした日本企業等の進出が進展していることから、現時点ではフィージブルとは言えず、開発の可能性

は見いだせなかった。また、d) 漁業専門家によれば商業ベースでの漁業の可能性も殆ど無いということであつた。ただし、e) 景観は素晴らしいものを有しており、1年以内にUAEとの間で舗装開通予定である道路を生かして観光開発を進めることについては十分可能性があるように思われた。

- 2) 開発大臣にも以上の点を伝え、少なくとも本調査を実施することにはフィージブルではないが、商工省・観光局へ本年度派遣予定である観光の専門家を活用して具体的な観光開発デザインを描くべきである旨勧めた。

6. 2. 3 地方中小企業振興計画策定

- 1) 本要請は地方を含めて、例えば床屋等の中小企業創設をきめ細かに支援する機関の設立及びベンチャー基金の設立、運用について日本の経験、知見を生かして具体策を提示してほしいというものであつた。21世紀に迫った脱石油経済の構築の必要性、及び2年程前から進めているマレーシアに習った経済のオマーン化推進(オマニゼーション)を円滑に進める必要性については十分理解が来るものの、そのためには教育やインセンティブも含めた本問題かについて十分な実態分析と協議と議論を尽くしたものは思われず、また、商工省へ現在派遣中の日本の専門家(中小企業分野)の意見も踏まえたもので無いことが判明した。
- 2) 従って、開発調査というよりは、それ以前に実際に相談窓口となつていて日本人専門家とよく議論し、本問題は何であるのかについて十分実態分析を行おうとするとともに、具体的な施策について専門家の知見を活用して具体策を実施に移すよう勧めた。また、大使もオマーンにおける企業育成についてどうすべきか重点的に検討したいとのことであつたので、その結果を踏まえたフィージブルな要請が新たになつた場合には前向きに対応すべきと考える。

6. 2. 4 石油開発に伴う地下水汚染

本要請については、そもそも日本が知見と経験を有している分野ではなく、また先方もJICAが内容を確認にくることは予想もしていなかつたように思われた。いずれにせよ、政策対策としてJICA及び本開発調査の仕組み、活用可能性について先方に情報提供できたことに意味があつたと言える。

7. 調査内容

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7 調査内容

7. 1 電力合理化システム需給管理

6月9日(日)午前、電力水利省を訪問し、開発調査が要請されている「電力合理化システム需給管理」について協議を行ったところ、概要以下のとおり。

7. 1. 1 要請内容・背景の確認

先方より本要請に係るTerms of Reference(TOR)(別紙)が提示された上で、本要請に至った背景について、現在、経済の発展に伴い電力・水の需要が増えているところ、電力については設備増強の結果、来年までの供給の見通しはついているが、水についてはかなり需給が逼迫している。

他方、供給等の段階でのロスとなっている部分が電力で17.3%、水で22.2%もあり、需要と供給の関係を最適化し、効率的な運用を行うことが急務となっている旨説明があった。

要請の具体的内容としては、

- 1) 電力・水の製造、輸送及び供給管理の改善に関するアドバイス
- 2) 低所得層にできるだけ負担をかけない料金徴収システムのアドバイス
- 3) 電力使用ピーク時への対応へのアドバイス

の3点があり、このうち、1.については、発電プラント、送電システムの管理といったソフト面及び送電網の改善等ハード面も含むものとし、2.については、現在、電気・水ともにかかるコストを料金で回収できていないところ、低所得層に配慮した形での料金体系を設けたいとの意向であった。

7. 1. 2 民営化の動向

当方より、電力・水部門の民営化の動向について尋ねたところ、本年からスタートした第5次5ヶ年計画では公的部門の民営化が求められており、同省では、マスカット地域の電気供給、サラサ地域の電気供給、水の供給の順に民営化を進めているところであるが、実際の民営化までにはまだまだ時間がかかるとの回答があった。

尚、民営化局長からの説明によると、民営化の進捗状況についてはマスカット地域の民営化は今年中に進める予定である旨説明があった。

1994年に開発調査が終了したバルカ発電・海水淡水化プラント開発調査のその後の取扱いについて尋ねたところ、現在、本プラントはBOOTでの実施を考えており、民営化の推進の一環として取り扱っている旨の説明があったが、今後の建設の具体的スケジュールについての言及はなかった。

7. 1. 3 発電・淡水化の相関関係・プライオリティ

電力と水の調査を同時に実施する必要性については、オマーンでは、海水淡水化により多くの水を得ており、グバラのプラントのように発電と造水の設

備が一体化している部分があるためと説明があった。

また、電力水利省のDAWOUD事務次官、ALI電気局長、MUHAMAD水局長、ALWAHAIBI民営化局長を表敬訪問した際に、電力と水について同時に調査を行うことは困難であるかも知れないので、どちらにプライオリティがあるのかについて尋ねたところ、事務次官より、社会的にはいづれも重要であるのでどちらとも言えないとの回答があった。

7. 1. 4 料金体系の確立

料金体系の改善提案については、行政に係る微妙な問題であるので、オマーン側で考える事項でないかと述べたところ、どういった料金体系を実施するかはオマーンサイドの判断であるが、その判断の材料となるオプションを提示して欲しいとの発言があった。

7. 1. 5 需給状況及び今後の計画

最後に、オマーンにおける電力と水の需給状況及び今後の設備増強計画についての資料につきオマーン側に依頼した。

7. 1. 6 サイト視察

協議後、本調査団は、マスカット地区内にあるグブラ発電・海水淡水化プラントを視察した。同プラントは、500MWの発電能力及び29ミリオンガロン/dayの造水能力を有しているが、電力については、需要の多い夏はフル稼働しているものの、冬には需要が落ちるので電気・水省の指示に基づき一部停止等の調整を行っている。また、水については需給が逼迫しているともあり、常時フル稼働している旨説明があり、発電と造水の運用上の管理の関連については特に説明はなかった。

7. 1. 7 所見

以上の調査結果を踏まえると、電力供給については、増大する電力需要に対し安定供給を行うことは経済・社会上極めて重要であること、ロスとなっている電力量が大きいこと、電力は貯蔵ができないことからその供給管理は重要であることから、開発調査の必要性は認められる。他方、水については、現時点で需給が逼迫しているので管理できる余地は少なく、調査内容についても漏水対策等限られたものとなると思われる。また、グブラのプラント視察の結果から、電力と水の管理については関連が薄く、技術事項も大きくことなることから分離して実施することが適切であると考えられる。

したがって、オマーン側に対しては、要請のあったうち、電力部門についての開発調査については今後議論を進める用意がある旨提示した上で、水部門については別途要請があれば検討する方向で調整することが適切であると考えられる。また、電力部門の開発調査を実施する際には、同部門の民営化の動向に留意を払う必要があると考えられる。

7. 2 ムサンダム地域経済開発

6月10日(月)午前、開発省及び石油鉱物省に於いて協議を実施、更に翌11日～12日に同省カミース地方開発課長の同行を得て現地視察を行ったところ、概要以下のとおり。

7. 2. 1 要請内容・背景の確認

ムサンダム地域はホルムズ海峡に面し、当国本土とUAEにより隔絶され当国においても開発が遅れた地域である。
本件調査要請についても今後の同地域の開発の方向性を探るとの、必ずしも鉱工業分野での対応に限定されない要請が提出されていた。しかしながら同地域は人口も約2万8000人と少なく、住民は零細な漁業あるいは農業に従事しているのみであり、将来の開発の核となる産業基盤に欠くといわざるを得ない。

7. 2. 2 地場産業振興の可能性について

本調査団の検討対象である商業貿易、軽工業については、対岸のイランとの間に一定の貿易活動が見受けられるものの、近隣に貿易の中心地たるドバイを控えていることから、将来的に中東地域の中心となり得るような貿易拠点に発展することは予見しがたく、これらの産業を中心とした開発計画の策定もその実効性に鑑みれば困難であるといわざるを得ない。

7. 2. 3 資源開発の可能性について

同地域における新たな資源開発を目的とした調査を実施する可能性については、石油鉱物省より現時点での資源調査状況及び鉱物資源開発のポテンシャルについて確認を行ったところ、概要は以下の通り。

- 1) 「オ」は産油国であるがゆえにすでに全土にわたり資源調査は終了しており、これらの過去の調査により同地域には石灰石が一部に賦存していることが既に判明している。
- 2) 当該石灰岩を利用したセメント産業育成の可能性も一概には否定できないが、隣国UAEに大規模なセメント工場が既に稼働中である事をも鑑みると、新たに労働人口の少ない本地域にセメント産業を育成する利益にも乏しいといわざるを得ない。

よって、改めて我が国の援助によって本件調査を実施する必要性は乏しいものと思料される。

7. 2. 4 観光開発の可能性について

当地は海底に堆積した地層が隆起し、永年にわたる風化崩壊により米国グランドキャニオンにも似た独特の地形を形成しており、将来右を活用した観光産業振興を通じた発展の可能性を探ることも可能であろう。右可能性については現在、ムサンダム半島西岸に観光ルートともなるUAEよりの道路の建設がすすんでおり、また、本年度後半には当国商工省に対して観光開発の専

門家の派遣も予定されているところ、右専門家の派遣の状況を踏まえ再検討する事が肝要であると思料される。

7. 3 地方中小企業振興計画策定

7. 3. 1 要請内容・背景の確認

本件計画に関しては完全な形のTORが提出されておらず、また、要請内容についても中小企業の創業にかかわる詳細なノウハウを公共機関が提供する事を通じ、学業終了後の若年層による中小企業創設を手助けする機関の設立、及びかかる企業の活動を財政面から支援するためにベンチャー基金の設立、運用方法に関する協力を主眼とするものである事が確認された。

7. 3. 2 「オ」国中小企業振興政策の現状

そもそも、「オ」において新たな産業の育成を推進するために何が問題となっているのかについての「オ」側の議論が明確でなく、さらに、要請内容にある中小企業創業のための情報提供についても、既に商工省工業開発局においては「オ」企業家の要請に基づいて必要な情報提供する政策を実施しており、1日あたり2～3件の引き合いがきている。また、中小企業の設立を支援するための金融制度もある程度整備されている状況にある。

このような既存の政策のレビューも要請内容には全く反映されていない。他方、商工省に中小企業振興担当として現在派遣されている我が国専門家によれば、本件要請については内部で議論を行っていないとのことであった。

7. 3. 3 所見

上記のように「オ」側で十分な議論が行われていない状況では、本件を開発調査案件として取り上げるか否かについて議論をすることは適当でないとは判断した。しかしながら、調査団としては、当国における中小企業振興の重要性に鑑み、「オ」側において我が国専門家を十分に活用して議論を行い、その上でさらに必要に応じて改めて我が国に対し要請するように申し入れ、先方も本主旨に理解を示した。

7. 4 石油産業の地下水汚染調査

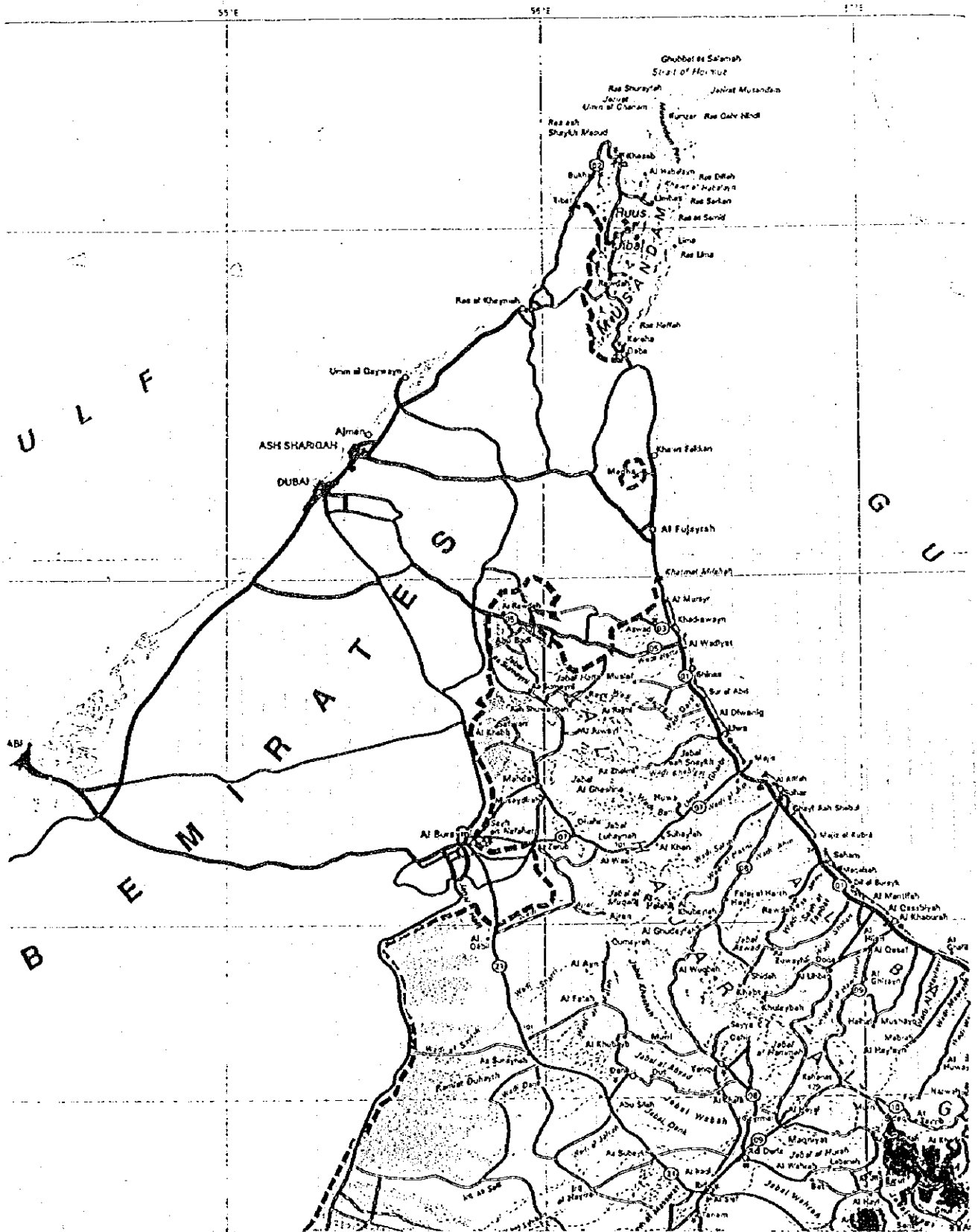
7. 4. 1 要請内容・背景の確認

要請書の内容からは、石油掘削に伴う地下水汚染の進展に対する対策についての調査が要請されているものと思料していたところ、先方の説明によれば、石油掘削に伴い生じる水の影響を与えないような取扱いと、それらによる環境汚染防止のための基準づくり、それらの観測についての調査等が要請内容であることが判明した。

7. 4. 2 所見

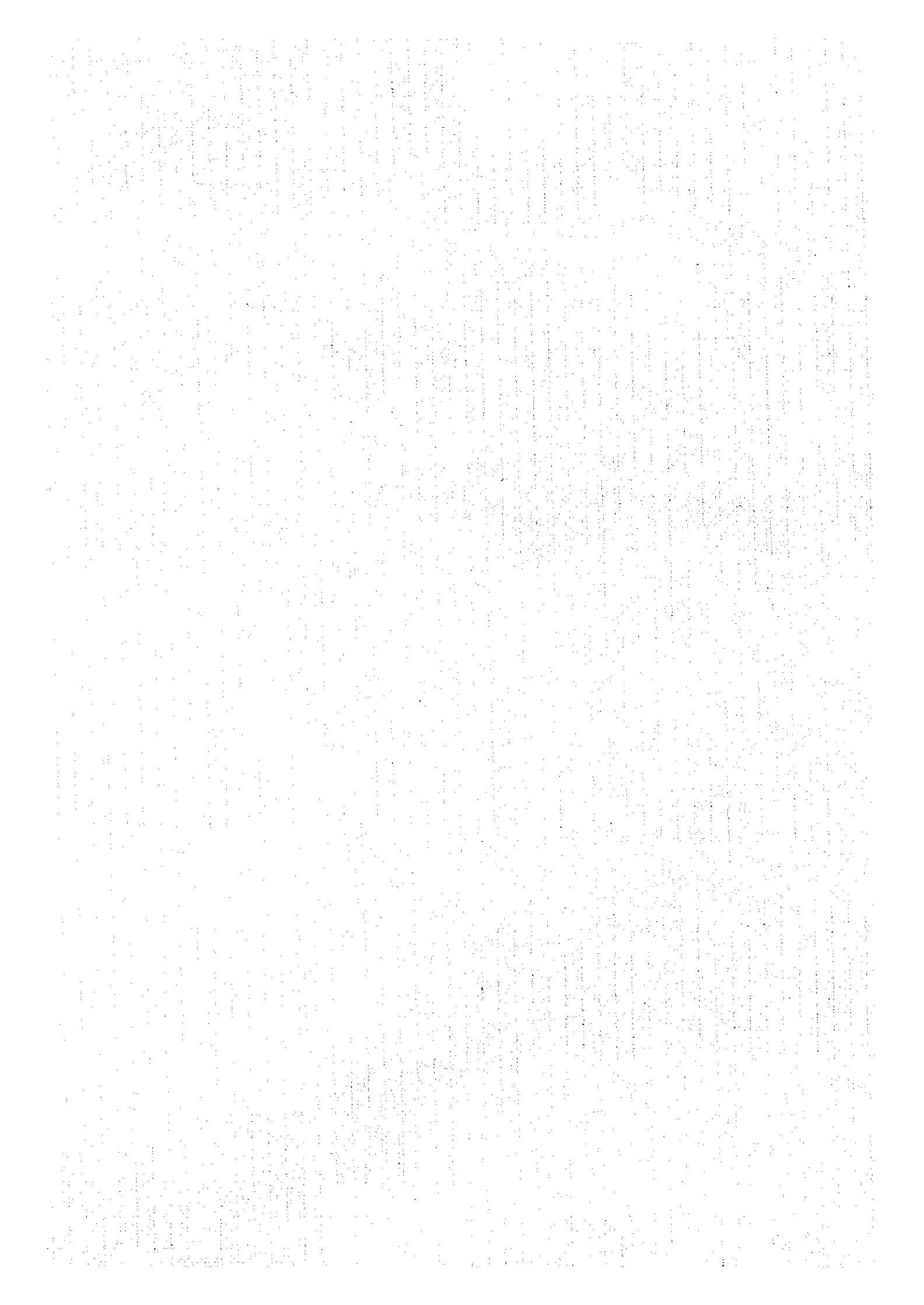
我が国は石油掘削の経験が少ないことから、こうした分野における専門知識を有していない可能性が高く、さらに、仮に技術的に調査が可能であっても本件は環境規制と直結することから、「オ」政府内で調査結果につき対立が起き、我が国が右対立に巻き込まれる可能性が否定し得ない。したがって、先方に対し、日本に持ち帰り協力の可能性について検討は行うものの、我が国が本分野において専門知識を有する可能性は低いため協力できる見込みは極めて少ないと考えられる旨申し入れ、先方も右に理解を示した。

THE SULTANATE OF OMAN





8. 協議機関／面会者



8. 協議機関/面会者

8. 1 案件別協議機関

1) 全般

- ・ 日本国大使館 : 表敬・協議 (6月8日)
大使館報告 (16日)
- ・ 外務省 (援助要請窓口) : 表敬 (16日)

2) 電力合理化システム需給管理

- ・ 電力水利省 : 表敬・協議 (9日)
- ・ グブラ海水淡水化プラント : 視察 (9日)

3) ムサンダム地区経済開発

- ・ 開発省 : 表敬・協議 (10日)
- ・ ムサンダム地方政府 : 表敬・報告 (15日)
- ・ 石油鉱物省 : 表敬・協議 (11日)
- ・ 石油鉱物省 : 表敬・報告 (12日)
- ・ 石油鉱物省 : 協議 (10日)

4) 地方中小企業振興計画策定

- ・ 商工省 : 表敬・協議 (10日)
- ・ 商工省 : 協議 (15日)

5) 石油産業の地下水水質汚染計画

- ・ 地方自治環境省 : 協議 (15日)

8. 2 主要面会者

SATURDAY 8TH JUNE 1996

協議# : 1
協議機関 : 日本国大使館
日時 : 1996年6月8日 (土)
面会者 : 香田 忠維
安井 兵典
松本 敬一
尾高 明彦

特命全権大使
参事官
一等書記官
三等書記官

SUNDAY 9TH JUNE 1996

協議# : 2
協議機関 : 電気・水省 (MINISTRY OF ELECTRICITY AND WATER)
案件名 : 電力合理化システム需給管理
日時 : 1996年6月9日 (日) 8:15~

1) 協議(8:15~)

MOHAMED AMIN MUSTAFA
JOSEPH C.M.THANARAJAH(DR.)
MUBARAK ALARAIMI

DIRECTOR OF
PLANNING AND STATISTICS(~ 8:55)
HEAD OF PLANNING(WATER)
ACT.DIRECTOR OF WATER PROJECTS

2) 表敬(10:00~)

ABDULLA AH DAWOUD
JAFFER MUHAMMAD
MOHD.REDHA HASAN ALI
AHMED ALWAHAIBI
JOSEPH C.M.THANARAJAH(DR.)

CHIEF SECRETARY
DIRECTOR GENERAL OF WATER
DIRECTOR GENERAL OF ELECTRICITY
DIRECTOR OF PRIVATIZATION
HEAD OF PLANNING (WATER)

協議# ; 3
協議機関 ; グブラ・発電海水淡水化プラント
(GHUBRAH POWER AND DESAL.PLANT)
案件名 ; 電力合理化システム需給管理
日時 ; 1996年6月9日(日) 11:45~
面会者 ;
RIBKI MOHD.SHMOUD HAMDAN PLANT MANAGER
SADULLAH SAYAC HEAD OF PRODUCTION,
MUSCAT WATER DIRECTORATE
他

MONDAY 10TH JUNE 1996

協議# ; 4
協議機関 ; 開発省 (MINISTRY OF DEVELOPMENT)
案件名 ; ムサンダム地区経済開発
日時 ; 1996年6月10日(月) 8:30~
面会者 ;
AHMED R.AL-MAMARI DIRECTOR GENERAL OF SERVICES SECTORS
KHAMEES AL-SHANCLOCLY DIRECTOR OF REGIONAL DEVELOPMENT
AND INFRASTRUCTURE SERVICES DEPT.
SAID AL-SHIKAILI ECONOMIC RESEARCHER
SAID AL-SHAMMAKI RESEARCHER ASSISTANT
ALI AL-OUIMRY RESEARCHER ASSISTANT

協議# ; 5
協議機関 ; 商工省 (MINISTRY OF COMMERCE AND INDUSTRY)
案件名 ; 地方中小企業振興計画策定
日時 ; 1996年6月10日(月) 10:30~
面会者 ;
MANAL MOHAMMAD ABDWANI DIRECTOR OF INDUSTRIAL, PLANNING
AND STUDIES
D.K SAXENA INDUSTRIAL ADVISOR, MINISTERS OFFICE
FAISAL ABDUL-AMEER TECHNICAL ADVISOR,
DIRECTOR GENERAL OF INDUSTRY
AHMED SULTAN ALMUGHEIRY DIRECTOR OF INDUSTRIAL DEV.DEPT.
SALEH AL-SHUAIBI ADMIN.RESEARCHER OF
INDUSTRIAL DEV.DEPT.

協議# ; 6
協議機関 ; 石油鉱物省 (MINISTRY OF PETROLEUM AND MINERALS)
案件名 ; ムサンダム地区経済開発 (同地域の鉱物資源開発のポテンシャル確認)
日時 ; 1996年6月10日(月) 13:00~
面会者 ;
SALIM OMER IBRAHIM DIRECTOR OF MINERAL EXPLORATION
他

TUESDAY 11TH JUNE 1996

協議# : 7
協議機関 : ムサンダム地方政府 (REGIONAL GOVERNMENT OF MUSANDAM)
協議案件名 : ムサンダム地区経済開発
日時 : 1996年6月11日 (火) 10:30~
面会者 :
SUBA BIN HANDAN AL SAAOLI GOVERNOR OF MUSANDAM
ABDUL AZIZ AL ABDULSALAM WALI OF KHASAB
ABDUL JALIL HUSSAIN AL SHEHI DIRECTOR OF TECHNICAL AFFAIRS,
MINISTRY OF REGIONALITIES AND ENVIRONMENT
KHAMEES AL-SHANCLOCLY DIRECTOR OF REGIONAL DEVELOPMENT AND INFRASTRUCTURE SERVICES DEPT.,
MINISTRY OF DEVELOPMENT
同行者 ;
水津 重雄 JICA専門家(水門調査)

TUESDAY 12TH JUNE 1996

協議# : 8
協議機関 : ムサンダム地方政府 (REGIONAL GOVERNMENT OF MUSANDAM)
協議案件名 : ムサンダム地区経済開発
日時 : 1996年6月12日 (水) 10:00~
面会者 :
ABDUL AZIZ AL ABDULSALAM WALI OF KHASAB
ABDUL JALIL HUSSAIN AL SHEHI DIRECTOR OF TECHNICAL AFFAIRS,
MINISTRY OF REGIONALITIES AND ENVIRONMENT
KHAMEES AL-SHANCLOCLY DIRECTOR OF REGIONAL DEVELOPMENT AND INFRASTRUCTURE SERVICES DEPT.,
MINISTRY OF DEVELOPMENT
同行者 ;
水津 重雄 JICA専門家(水門調査)

SATURDAY 15TH JUNE 1996

協議# : 9
協議機関 : 商工省 (MINISTRY OF COMMERCE AND INDUSTRY) 第二回目
協議案件名 : 地方中小企業振興計画策定
日時 : 1996年6月15日 (土) 8:00~
面会者 :
MANAL MOHAMMAD ABDWANI DIRECTOR OF INDUSTRIAL, PLANNING AND STUDIES
D.K SAXENA INDUSTRIAL ADVISOR, MINISTERS OFFICE
AHMED SULTAN ALMUGHEIRY DIRECTOR OF INDUSTRIAL DEV. DEPT.
SALEH AL-SHUAIBI ADMIN. RESEARCHER OF INDUSTRIAL DEV. DEPT.
協議# : 10
協議機関 : 地方自治環境省 (MINISTRY OF REGIONAL MUNICIPALITIES AND ENVIRONMENT)
案件名 : 石油産業の地下水水質汚染調査
日時 : 1996年6月15日 (土) 10:00~
面会者 :
PAUL C. SHARPLES CHIEF INSPECTOR WATER POLLUTION
ABDULHAMID A. KHATIB CHIEF CONTROLLER WATER POLLUTION AND WASTE
MOHAMED ALARAIMI DIRECTOR OF INSPECTION CONTROL
SAID DARWEESH AL-ALAWY DIRECTOR GENERAL OF HEALTH CONTROL

協議# ; 11
協議機関 ; 開発省 (MINISTRY OF DEVELOPMENT)
協議案件名 ; ムサンダム地区経済開発
日時 ; 1996年6月15日 (土) 13:00~
面会者 ;

MOHAMMED BIN MOOSA AL YOUSEF MINISTER
KHAMEES AL-SHANCLOCLY DIRECTOR OF REGIONAL DEVELOPMENT
AND INFRASTRUCTURE SERVICES DEPT.

同行者

香田 忠維
松本 敬一
尾高 明彦

特命全権大使
日本大使館一等書記官
〃 三等書記官

SUNDAY 16TH JUNE 1996

協議# ; 12
協議機関 ; 外務省 (MINISTRY OF FOREIGN AFFAIRS)
協議案件名 ; 全般
日時 ; 1996年6月16日 (日) 11:30~
面会者 ;

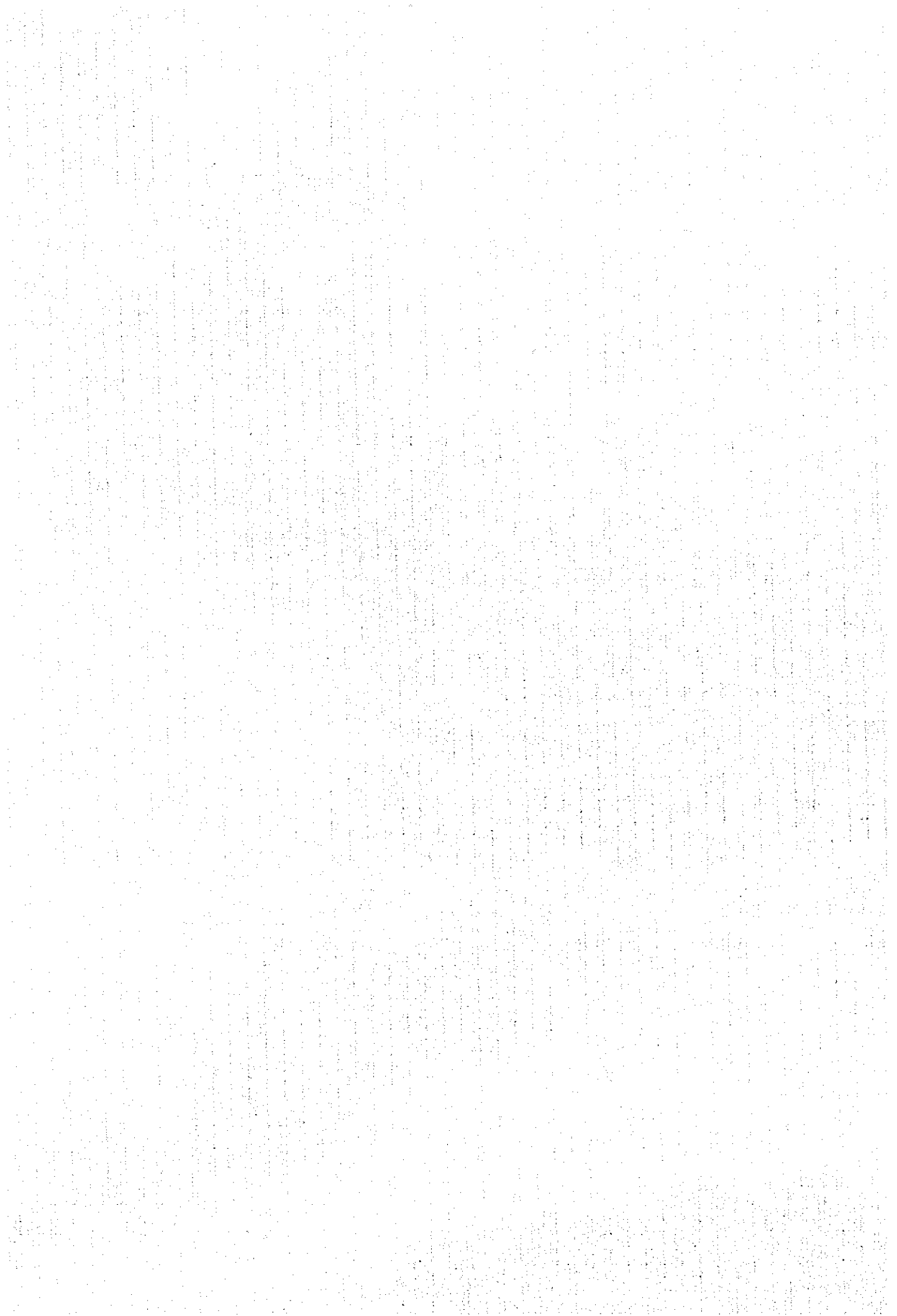
H.E. AWADH BADR MAREE AL SHANFARI
他

同行者

安井 典
松本 敬一
尾高 明彦

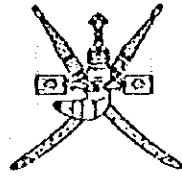
日本大使館参事官
〃 一等書記官
〃 三等書記官

第2部 関連資料 (APPENDIX)



Sultanate of Oman
Ministry of Commerce and Industry
Muscat

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



مكتب الوزير

Minister's Office

سلطنة عمان
وزارة التجارة والصناعة
مسقط

A PROPOSAL FOR TECHNICAL ASSISTANCE FROM THE GOVERNMENT OF JAPAN.

Diversification of the economy for reducing its dependence on non-renewable resource of oil, is an imperative need for the Sultanate of Oman which has to be met within a time-frame of about 25 years. This diversification is to be brought about through an effective, efficient and competitive private sector. There are some qualitative dimensions for meeting this challenge. The human resource development, promoting an equitable distribution of income and the dispersal of development amongst various regions of the country are some important dimensions which have been accepted as policy objectives. We cannot over-emphasise the role of small and medium enterprises in developing and diversifying the economic base, sources of production/ services and income, mobilization of savings, particularly of small income citizens, spreading economic activities in various regions and opening up avenues for productive employment for the increasing number of Omanis in the labour force and finally bringing about a more equitable distribution of income. In other words, the development of small and medium industries has been accepted as an important and effective mechanism for fulfilling some of the major objectives envisaged in Oman Vision 2020.

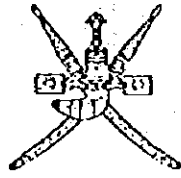
By and large, economic activity has been concentrated in the Muscat Capital area. Significant portion of Omani population lives in other regions of the country. Nearly 52% of Oman's population is under 15 years of age and in years to come, a large number of educated and qualified young Omanis would be entering the labour force for whom productive employment opportunities have to be created. With a view to creating these opportunities, as also entrepreneurship, it is essential that small and medium enterprises be encouraged in regions other than the Muscat Capital area.

Japan has a long and commendable experience of setting up highly productive and efficient small businesses having interlinkages with other sectors of the economy. In the efforts towards fulfilling the Vision 2020, the Sultanate of Oman would be greatly benefited if the rich experience of Japan could be brought to bear on the mechanism and institutional support system to be recommended for developing efficient and competitive small and medium enterprises, particularly in the regions away from Muscat Capital area.

The Ministry of Commerce & Industry, Sultanate of Oman would welcome technical assistance from Government of Japan through conducting an

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indepth Study with a view to recommending concrete steps and measures to be taken in Oman for achieving the above-mentioned objectives. Broadly, the proposed study should cover two parts. Part 1 of the study should cover the following:

- i) Identification of appropriate small and medium enterprise opportunities in different regions of Oman.
- ii) The steps to be taken for assisting the promotion of such enterprises.
- iii) The institutional set up suited for providing the required assistance to such units, particularly in the areas of technical information and know-how, marketing of products and efficient management and financial control.
- iv) The facilities and incentives which would be required for enabling the designated institution(s) to effectively assist promotion of such enterprises.

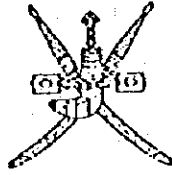
Part 2 of the study should specifically deal with the need for, the mechanism and functions of a Venture Capital Fund(s) dedicated to providing equity finance as well as a package of other support measures in areas like technology, marketing and training of the personnel to small and medium enterprises. This part of the study should take into account the experience of Japan and some other countries who may have successfully set up Venture Capital Funds for encouraging small and medium enterprises. The modality of setting up such a fund in Oman, its functions and the assistance which should be provided to such a fund by the Government in the form of facilities and incentives would also have to be covered by the study.

It is felt that an indepth study providing realistic and practical recommendations on the subjects mentioned above would furnish the Government with a valuable tool for achieving some dimensions of Vision 2020.

In the recent past, the Government of Japan has provided technical assistance to the Ministry of Commerce & Industry in setting up an Industrial Statistics and Information Centre (currently on-going project) and preparing an Industrial Master Plan for the Sultanate. It has also been agreed that the Government of Japan would provide technical assistance for studying the

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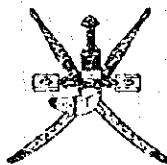
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مسقط

establishment of an Industrial Research Centre in Oman. The Government of Japan are thus fully conversant with the conditions prevalent in Oman as well as the facilities which are provided to the members of the study team. Therefore, at this stage, it may not be useful to fill the standard application form for technical cooperation to be provided by the Government of Japan. It is proposed that first the concept of the study mentioned above be accepted in principle by the Government of Japan. On acceptance, a couple of experts from the executing agency (such as JICA etc) may visit Ministry of Commerce & Industry for agreeing upon detailed Terms of Reference and time-frame for the study.

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وزارة البلديات الإقليمية والبيئة

Study On Effects Of Petroleum Industry On Groundwaters
In The Sultanate Of Oman

Technical Co-operation (Development Study) By The Government Of Japan

These notes are devised for general guidance to the Project Identification Mission On Development Study from the Government of Japan as a supplement to the information and data supplied on the original application form in order to afford an adequate appreciation of the nature of the proposal.

The Mission is scheduled to meet with this Ministry on 15th June 1996 to hold discussions on this subject.

Whilst Oman and other GCC States are major producers of crude oil, and all are concerned with the protection of their environments linked with sound sustainable development, there is no environmental legislation that refers specifically to the disposal of oilfield production water or the overall impacts on groundwater in general of the petroleum industry as a whole.

Activities other than production water disposal that require attention would include features such as pipeline leakage, other spillages, chemical wastes handling and disposal, sludge farming and sludge disposal, tank cleaning and other such activities.

Wastewater disposal standards in Oman (The Regulations For Wastewater Reuse And Disposal) relate to a wide spectrum of waste waters and only one Clause may be interpreted as applicable to oilfield production waters. Other Regulations also do not practically cater for the oil industry and its features.

This subject is a unique and specialised one and requires separate and detailed study in order to proceed in the development of relevant environmental standards. For each barrel of oil extracted, there is an equal or greater quantity of polluted and highly saline waste water generated. At Oman's current oil production rate of some 800,000 barrels per day, the associated waste water statistics are of the order of some 1.2 million barrels per day of production water. This is predicted to rise almost four times higher by the year 2005.

Oilfield and related activities are also scheduled to under a great deal of expansion during the next four years as large gas reserves are currently being developed to formulate a liquified natural gas production facility. This will

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وزارة البترول والثروة المعدنية

include new wellfields, long transmission pipelines and downstream liquefaction and export terminals.

Whilst up to 40% of the production water is reused for reservoir pressure maintenance, the long term forecast is that the volume of water that can be reinjected for reservoir pressure maintenance is only likely to increase by a small amount.

In an arid country all water sources should be appraised for their suitability for drinking or other beneficial use. It is highly unlikely however that oilfield production water could be economically converted to meet potable standards. Also the remoteness of the source from large population centres would further tend to negate the treatment of production water for potable supplies.

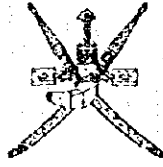
Whilst in some limited context it is possible to utilise some such waters for commercial salt production, the large total national volumes and also the presence of contaminants prohibit this option. Also the use of surface evaporation ponds, whilst sounding attractive in a desert environment, is not viable as evaporation is inhibited by oil content and very large areas of natural desert would have to be inundated. This is not acceptable due to wildlife. In one field alone it has been calculated that one such lagoon would have to be sized at 20 square kilometres.

The general practice in Oman has been to dispose of the production water in shallow Tertiary formations but this activity cannot continue (or increase) unabated. It is not possible in these notes to discuss the technicalities involved and much detailed study work is required to compile and assess the full scope of pertinent data.

Initial progress has been achieved by the formulation of a Production Water Management Plan which has been in operation for almost three years and adopted by all oilfield producers as current standard policy. It is not fully implemented at this time as its development is still proceeding and also this is only one impact feature of the industry.

Copies of the Plan and subsequent progress activity reports are held with this Ministry. In essence the Plan calls for several new initiatives, including minimisation of production water generation, maximise on feasible reuse, and ultimately subsurface disposal into deep formations where exploitable waters cannot be affected.

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وزارة البلديات والإقامة والبيئة

Reference to existing legislation in a number of highly industrialised countries shows that subsurface disposal, preferably to the producing reservoir, is an accepted practice and that disposal to exploitable or potentially exploitable aquifers is to be avoided. Also use of non-confined aquifers which may connect to other aquifers is also to be avoided.

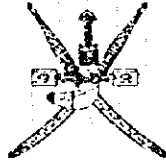
It is the intention of the Government of Oman to develop a policy to satisfactorily address the issue not only of production water disposal and its impacts on groundwaters, but also the other activities of the industry as a whole. This policy and its procedures are then to be developed into subject specific legislation which incorporates control programmes for each discharge or facility location..

This intention was originally incorporated as a proposal for inclusion as a project within the Government of Oman's current Five Year Plan. Due to economic restrictions however this has not been given a financial budget allocation and consequently there is no funding available from within Oman for this project. It is with this aspect in mind that assistance was sought from the Technical Co-operation Development Study of the Government of Japan.

To this end therefore the objectives of this Technical Co-operation Development Study are as follows:

- * To investigate alternatives for reducing the quantities of production water and elimination of inherent pollutants and increasing its potential for reuse.
- * Review and present a compilation and assessment of production water legislation and groundwater quality standards (where of significance) in other countries with similar situations. This is to incorporate proposals for finite practicable definitions of production water; e.g. to what extent are additives such as corrosion inhibitors, oxygen scavengers, production chemicals and other hazardous wastes to be excluded. The issue of prevention of the potential to create chemical cocktails in the receiving formation is also integral to this requirement.

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- * Develop a programme for pollution monitoring in oilfield related groundwaters in Oman.
- * Establish a central computerised data bank in the Ministry for all data and its analysis in respect of production water statistics, discharges, relevant groundwaters and other related practices or information as is developed by the study.
- * Develop specific Environmental Guidelines to be subsequently formulated into Regulations concerning oilfield production waters and their disposal and protection of groundwaters in Oman.
- * Prepare plans for the establishment of a National Environmental Centre for advice, assistance and specialised research on the environmental issues related to oil extraction, production and transportation.
- * Conduct subject related seminars or conferences in co-ordination with other oil producing countries and companies and concerned government, environmental, or groundwater management agencies.
- * Provide all necessary training and assistance in all scopes of the work to the Ministry staff members designated as understudies to the Technical Co-operation Development Study Project. This should include setting of assignments for any such person to utilise in a special course of study.

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Population growth and

SALEM Saad who in his late thirties is now the father of eight children with the youngest being 18 years and the youngest less than one year. As he and his wife like many couples do not seem to be aware of the advantages of family planning and the methods of birth control, it is likely that they will have a few more children as the wife is well within child-bearing age.

They come from a low-income household group and live in a two-room house in a village in the wilayat of Iaki. Salem is burdened permanently with all types of debts and faces financial difficulties. He and the increasing number of his children typify a case that is so common among so many families throughout the country and in particular in the rural areas. The size of the families has been increasing extensively in a very spectacular manner for about the last two decades in the width and length of Oman. The national average fertility is (Unicef Report 1994) about 7.8 children per woman. The total fertility rate in large cities is 5.3 and 7.1 in smaller cities, but for the rural areas is almost 9.11. This is not only considered to be the highest rate for the Gulf but is also one of the highest in the world.

Very high growth and fertility rates

The growth rate (births minus death) of about 3.5 to 4 per cent of the indigenous population alone also makes Oman among the highest.

This was due to the steep decline in the mortality rate of both infant and child concomitant with the successful implementation of development programmes and the increasing availability and accessibility of health services and rising education. The infant (under one year) mortality improved from over 100 deaths per 1,000 estimated in 1975 to 28 in 1991 and 23 in 1993. For children (under five years of age) the mortality was 33 per 1,000 in 1993 compared with over 146 in 1975. The trend as it seems continues to improve. Oman's achievement in this important area is praiseworthy.

The high fertility and growth rate as it is obvious has been increasing the Omani population in a steep exponential way. The population since 1970, with the influx of the Omanis returning from abroad as another major factor, has increased almost four-fold from a mere 435,000 as was estimated by a known British Consulting firm commissioned before the change to carry out the first socio-economic survey, to reach a figure of 1,483,220 at the time of the census in 1993. It is assumed that the population since then has increased by about 100,000 to reach a figure at present to about 1.6 million. If the present rate of growth of 3.9 (estimates range from 3.5 to over four per cent) continues, our population would reach 3,411,513 by the year 2015.

High dependency ratio

The fast population growth has resulted in an age composition that follows the pattern of a pyramid which is bottom-heavy typical of developing countries with a very high growth rate and young population. More than 60 per cent of our people are below 20 years which also indicates that the dependency ratio is very high. The dependency ratio is defined as the ratio of persons in the dependent ages (under 15 and over 65) to those in the economically active ages (15 to 65). The Omani population dependency ratio of 126 dependent persons to 100 active persons, is



By Kamal Abdurrehda Sultan

one of the highest in the world. The average household size is 7.7 persons. The male, as is normally the case in all the GCC countries, is almost the only financial supporter of the family. Although, gradually more and more females do work outside their houses but the percentage of such females is still considered low. This constitutes only about five per cent of the total working population.

With inordinately large family to maintain and if the father happens to come (not an unusual case) from the social group with low or fixed income or is under-employed, the family involved is in perennial financial hardships. Although one understands that there has not been a nationwide survey on family income levels in Oman, a few limited surveys confined to certain rural areas were carried out by a number of UN agencies.

One such survey, 'Musaijer' of 1991 according to recent Unicef, 'Situation Analysis of Children and Women in Oman', indicated that nearly 33 per cent of families had monthly income of about RO 200 and another rural 1986 survey showed that 44 per cent of households had an income of over RO 100 per month. Another survey by NCDP in wilayat Adam revealed that 21 per cent of households had a monthly income of RO 100 or less. However it is felt that considerable research is required to identify various and changing income trends in many areas and regions of the Sultanate.

Big families and possible risks

Poverty level is often related to the big size of the family. As we saw some families are hard pressed financially because of increasing numbers of children which has resulted in many of these families reaching poverty line in spite of benefits from availability of certain important social services, eg free health and education, subsidised or even free housing, etc. The personal indebtedness of Omani individuals is considered to be extremely high.

With an increasing number of children to support and maintain, the head of the family has hardly any money left to save and invest for the future, well-being of the family. Even the very basic needs of the family members in such cases are met with difficulty. The members feel frustrated and what makes it worse is the fact that the needs and social expectations of the people involved, set primarily by affluent classes, have unfortunately been continuously on the increase. This leads those people left behind to feel wretched and miserable. This augments their feeling of helplessness and alienation.

The father who is continuously struggling and incessantly occupied as to how to be able to meet his large family's needs and demands

become contracted and introverted in the process. The mother who unceasingly has to attend to each and every detail, relating to household affairs and the young ones she is rearing in addition of frequent pregnancies feels exhausted and consumed. Neither have hardly any interest, energy or time to give to their children.

Under such conditions, where children continuously face frustrations besides psychological needs of care and love not sufficiently met, they grow up as psychologists suggest, with personality distortions, with multiple consequences later resulting in fear, insecurity and cruelty, which many prevent the child from reacting normally with his environment and contributing positively to his society. To get his very reasonable needs fulfilled from time to time and receive abundant love and attention from parents is absolutely necessary for the sound psychological upbringing of the child. This is normally possible when there are fewer children, no more than two or perhaps three. Happiness in childhood is believed to be absolutely necessary to produce the best human beings.

The risks of crowded families, with a very large number of children, far more than the parents can cope with administratively, financially and emotionally, are great in our present day circumstances, and have many adverse implications. Besides, producing children one after the other as is happening, is considered to be another major factor associated with the occurrence of such harmful results of pregnancy, as prematurity, infant mortality, mental retardation, congenital defects, incidence of maternal mortality and diseases, unwanted child and child abuse.

Omani children, born and brought up in crowded families passing through the difficult circumstances described run the risks of undergoing many changes as far as the present basic qualities and traits are concerned. These exceptional characteristics (I may be subjective and prejudicial) of urbanity, hospitality, generosity and tolerance which the average Omani man possessed from the testimony of many old travellers and visitors could be very much jeopardised.

High national cost

On the national level, the very fast population growth rate produces its own complications. It means more and more schools, more hospitals and clinics, more housing, more social amenities etc. Ten years ago there were, for example 192,854 students registered for the year 1984-85 and 541 schools; by 1993-94 there were 448,977 students and 899 schools. In the school year 1994-95, the number of students registered at government schools alone were 486,000 attending 926 schools and for the current academic year the number was 509,000 to be accommodated by 963 schools.

The projected number of students by the year 2015 is over one million and the number of schools to be more than double. Instead of allocating more resources to improve the buildings and facilities of existing schools, to upgrade the quality of education which suffers presently from a number of flaws, resources will have to be diverted for the process of expansion by building new schools and recruiting more teachers, etc.

The same could be said about medical facilities. With the exponential rate of growth of population a lot of resources will have to be allocated for the mere expansion instead of improvement of the (re-



FAST growing population means and clinics, more housing and

cent improvements in health services are commendable) quality and distribution of the services, population per doctor and population per nursing person which are considered as appropriate indicators of the adequacy of health services.

With regard to housing there is an ever growing demand for more loans either for improving and expanding or for building new houses. The total number of applicants for low cost buildings alone (interest free loans) stood at a total requests of over 30,000 at the end of 1993. These demographic investments are believed to be approximately proportional to and sometimes even greater than the increase in population.

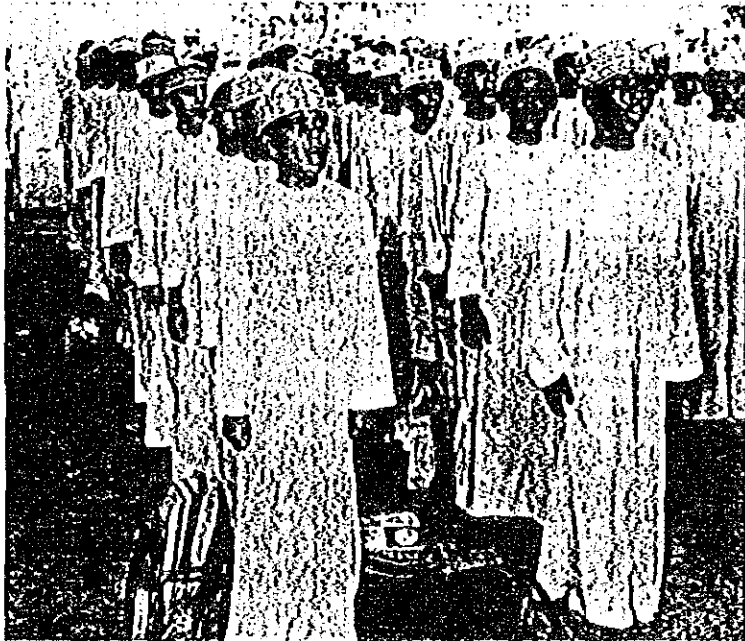
While these investments of course are socially necessary they are not financially productive. If more of these resources could be directed to developing and improving water resources, increasing the base of industry and if money was switched to savings, investment and economic development it would help develop the national wealth and the national income and improve the quality of life further.

Population growth and the ensuing effect of the physical development and various activities are considered to be one of the top determinates of environmental degradation everywhere in the world. One is inclined to think that Oman could be a case study for environmental issues focusing on what rapid population growth and dramatic physical developments (in spite of praiseworthy environmental conservation policies adopted by the government) can do to its environment.

The increase of population from the estimated below the half million mark in 1970 to over 2.1 million at the end of 1995, meant that thousands of buildings, roads and other amenities had to be put in place in major towns, in rural areas, villages and almost everywhere.

Many of us can remember Seeb as a resort area and parts of Batinah, Fanja, Sunail and many other places as being entirely rural about 30 years ago rather than being urban as is now the case. All these places witnessed are still undergoing a dramatic transformation.

national development



more schools, more hospitals and social amenities. Ten years ago

When one visits villages from time to time he finds that the concrete area size is rapidly expanding and in many cases the total building areas have grown several times bigger than the original sites of the villages with their greenery and trees. Much of this unfortunately seem to be unavoidable as far as the impact of growth is concerned.

This is producing tremendous pressure on our fragile resources particularly water, in coastal areas where salinity intrusion is taking place at an alarming pace and in the overall depletion of aquifers everywhere.

The question of the carrying capacity and sustainability of the environment and its resources vis-a-vis the human numbers and their activities is a major criterion about whether a given area is under or over-populated as the world renowned author on population Paul Ehrlich contends in his book *The Population Explosion*.

Some of these resources as seen in our case have been suffering, notably water which is precarious and fragile. There is already an estimated deficit at around 400 million cubic metres a year which is the difference between recharge and consumption. This seems to be fast increasing as the population grows and human settlements expand, and of course due also to unplanned and mismanaged water usages. Fast and effective action is required to rectify the situation.

There is enough evidence that fisheries, another resource, is believed to have been subjected to considerable pressures in recent years as demand has escalated and due also to policies presently adopted which are causing much potential value to be lost. The sector is very much in need of review and revision. Otherwise the viability of this very vital local resource will be threatened.

GCC population

The excessive rise in population growth with its social, economic and environment implications is taking place everywhere in the GCC countries and certainly in many areas in the world.

The population in the six Gulf countries in 1990, according to the World Bank, was 22,024,000 and

there were only 192,854 students registered whereas there are 509,000 students in the current academic year.

the projected population for 2010 is 41,631,000 — an increase of 89 per cent. This very high growth in the population will cause very dramatic structural problems in the economies of these countries. Already the GCC states are not among the richest in the world as was the case almost 15 years ago at the time of the oil boom when per capita income in these countries exceeded that in the US.

At present a total collective GDP of about \$710 billion and a total population, including expatriates, of 24 million, the GDP per capita is \$9,700 which is considered to be one-third of the US level and two-thirds of the Israeli level. The considerably reduced income means lower rates of subsidies per person.

If governments are forced, due to changed economical conditions, to adopt austerity programmes which may be inevitable in many cases to offset budget deficits, the possibility of unrest and tensions may arise.

Population explosion

The population increase in the world is quite staggering. Every year more than 90 million people are being added to an already crowded and shrinking planet. In the large cities, particularly those of under-developed countries, millions of under-privileged people dwell in the streets permanently. They are malnourished, living in an environment of filth and disease. As this trend increases it carries with it a tendency towards violence, dehumanisation, persecution and many other social problems.

Many governments and agencies in the world have become increasingly concerned about the population problem in recent years. Nevertheless it is still felt by those who are concerned about population growth that the problem, serious as it is, does not get the level of concern that it justifiably warrants.

The Rio de Janeiro Conference in 1992 on Environment did not include officially in its agenda the issue of population explosion because of disagreement over the sensitivity of the subject. This was in spite of the fact that the population issue is considered by environmentalists and others, both in high

level of consumerism and ecologically unsound technologies, as being the major determinant factor of environmental degradation of the planet.

Many politicians who are at the helm of things are considered to be the ultimate creatures of the moment and have very little incentive to tackle or identify long-term trends. Their time horizon extends until the next election time, which is only four to six years ahead and they have their own priorities and agendas which very much determines their success or failure. Some still strongly hold to the old notions of mercantilism which concerned itself more with national power, a bigger army and a bigger fleet, etc rather than with the real welfare and prosperity of their own countrymen and other human beings.

On the other hand a number of thinkers and intellectuals long have had the vision and the foresightedness to foresee a situation of poverty and social unrest as a result of excessive births and childbearing. Aristotle warned that if no restriction is imposed on the rate of reproduction poverty is the inevitable result and poverty will lead to civil dissension and wrong-doing. Plato advocated a population equilibrium and suggested devices to keep the population size constant.

The most famous among those who advocated population control in recent times was Rev Robert Malthus, the famous British economist, who advocated in his celebrated essay about 200 years ago that "the power of population is indefinitely greater than the power of the earth to produce subsistence for man". Times seem to be certainly proving him right.

A professor at Cambridge, Sir Roy Cline, contends in his recent book *Too Many People*, that the food production in the world for the last two decades for both the land and sea has declined relative to the population growth. Agricultural land has been shrinking both due to soil erosion and declining possibilities of irrigation. Water availability is becoming an increasing constraint in a number of countries. According to Cline "there are warnings that the earth is finite and that natural systems are being

pushed even close to their limit".

Old prejudices

All these indisputable facts of shrinking agricultural land and forests, depletion of stocks of fisheries, reduction in the availability of water resources, malnutrition and poverty of hundreds of millions of people, etc have begun lately to sink into the heads of many politicians and other religious authorities. However, there are still certain authorities in the world, temporal and religious who are opposed to almost all forms of contraceptives. Most notable among these attitudes is that of orthodox Catholicism.

This is rather unfortunate since the question of whether a situation of over-population in a country where resources are very limited, where there is abject poverty and human suffering, is not one of those metaphysical propositions which is difficult to prove or disprove. This is a very empirical proposal where on the basis of very tangible facts and figures and data one can resolve the issue.

Islamic support

Many of the Islamic jurists (*Fukaha*) attitude about family planning was factual, pragmatic and sympathetic to the changing of the times and conditions. According to Dr A Rahim Ouwari in his well researched book *Family Planning in the Legacy of Islam*, the majority of theologians (*Ulama* *Al-Fukaha*) from almost all schools of Islamic jurisprudence (with the only dissent coming from *Dahiri Mughab*) agree that "al-azl" a natural method of contraception practised at the time of the Prophet by important companions and followers for the sake of retaining genetic purity is permitted with a wife's consent.

There is also a need to reduce the excessive growth rate of population in Oman so that it eventually gets stabilised. There is already a growing trend particularly among the educated classes in the country to reduce the size of their families. Experience has shown almost everywhere that reduction in the family size could be achieved when men and women have access to good education, women have increasing participation in the labour force of the country and also when per capita income rises as a result of progress in economic and social development. The raising of the level of consciousness of the people and providing them moral guidance and making contraceptive methods freely available is also a very important procedure.

The launching of the child spacing programme by the Ministry of Health was an important development though this was primarily aimed at the protection of the child and mother's health and promoting safe motherhood and breast feeding which is very much prescribed by Quranic tenets that it should continue for two years.

However what is also important in this stage is to adopt a national policy about the supposed optimum size of the Omani population and the appropriate rate of growth. Various policies contributing to these aims should be adopted and implemented by the different government departments. Such policies should definitely take into account and recognise our very fragile water and agricultural potentialities and the limited proven hydrocarbon reserves.

All this should enable us to limit the unbridled and excessive child-births and high growth rates which may also fit in with the suggestion of His Majesty the Sultan made about two years ago of an Omani family of a total of five members.

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