

**THE SCOPING PROCESS IN THE
EXTRACTIVE INDUSTRY IN
MALTA**

**A CASE STUDY FOR SOFT STONE AND HARD
STONE QUARRIES**

**a dissertation submitted in partial fulfilment for the Degree of
Masters of Science**

in

Environmental Impact Assessment

Joe A. Doublet

**Faculty of Science
Institute of Biological Science
EIA Unit**

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DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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ABSTRACT

The aim of the dissertation is to find out if the scoping process, to produce Environmental Impact Assessments, in the Maltese extractive industry, is carried out in an appropriate manner.

Scoping is a process whereby the significant impacts of a development are identified and are earmarked for a deeper study through the impact assessment report.

The quarrying industry still uses old technology and is unwilling to modernise, due to the financial burden involved.

The Environment Planning Act, 1991 was utilised by the recently established Planning Authority, to request quarry owners, who wanted to extend their zone, to produce an Environmental Impact Assessment (EIA) according to a set Terms of Reference.

The study utilised three methods to reach its aim:

1. a matrix analysis of the EIA reports in the quarry industry;
2. a questionnaire analysis aimed at specific targeted groups, to elicit their perceptions about the process and its management;
3. interviews with key personalities involved in the EIA process and in the industry, to evoke the problems encountered and the reasons behind their actions.

The study found that the approach adopted by the Planning Authority is giving unsatisfactory results. The whole EIA process and its basic requirements are unknown to the various groups of people studied. It has also shown the lack of availability of baseline studies, making it difficult to establish significant impacts. There is also a need for a deeper analysis of the management techniques and the technology utilised in the extractive industry.

The study recommends the restructuring of the:

1. quarry industry;
2. Environment Management Unit within the Planning Authority to include all aspects of impact assessment under its umbrella;
3. Environment Protection Department to act as a complementary part in the technical nature of the EIA process.

A series of educational courses aimed at the key participants of the process is also recommended.

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LIST OF ABBREVIATIONS USED IN TEXT

BC	Before Christ
BDA	Building Development Act
DCC	Development Control Commission
DCU	Development Control Unit
EEC	European Economic Community
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMU	Environmental Management Unit
EPD	Environment Protection Department
EPS	Environmental Planning Statement
EU	European Union
GIS	Geographical Information System
GRTU	General Retailers and Traders Union
MDC	Malta Development Corporation
N/A	Not available information
NGOs	Non-Governmental Organisations
NIMBY	Not In My BackYard syndrome
PA	Planning Authority
PDS	Project Description Statement
TIS	Transport Impact Statement
TOR	Terms of Reference

Chapter 1 Introduction

1.1 Aim

The aim of this thesis is to study whether the scoping process of Environmental Impact Assessments (EIA), in the Maltese extractive industries is carried out in an appropriate manner and to evaluate if there is a need for improvement and suggest ways how this may be done.

Justification

The extractive industry was chosen as an area of study because it is the only industry which supplies the raw material from the limited local natural resources to the construction industry which employs more than 3000 people (Xuereb, 1995). In 1987, Malta's fourth biggest industry was that of construction (Colin Buchanan and Partners *et al.*, 1991 a).

Quarries leave large scars in the landscape and have also been blamed for damage to important archaeological sites, as well as that to the natural environment (Wardell Armstrong *et al.*, 1991).

Recent studies commissioned by the Planning Authority (PA) have shown that there is a sufficient softstone reserve for the next 260 years and a hardstone reserve for the next 120 years, if the present on-going use in the industry persists (Planning Authority, 1997). This shows the importance of the resource and the need and requirement for the present and future generations to handle well applications for its extraction.

1.2 Outline of this Report

The report will be divided in the following manner. Chapter one will contain the objectives of the project along with a brief historical background about the Maltese Islands, their geology and the planning process which will get the study in context for the reader.

Chapter two will deal with the local Environmental Impact Assessment process, indicating the importance of scoping, the present legislative background, the Terms of Reference used and the changes which are envisaged for the near future.

Chapter three will describe the investigative method used in the report, that is, the analysis of the EIA reports which have been done so far, using matrices and also the questionnaire which was sent to various groups.

Chapter four will deal with the results obtained from the investigative part of chapter three, whereas chapter five will discuss the results and include information obtained from the interviews with a number of people.

Chapter six will be the conclusion of the report. This will highlight areas of concern, recommendations and a summary of the main conclusions, finally answering the question set in the aim.

1.3 Historical background

The Maltese Islands are a group of small, low-lying islands 96 Km south of Sicily at the centre of the centre of the Mediterranean Sea (Figure 1). The islands are made up of three inhabited islands, namely Malta (245.7 Km²), Gozo (67.1 Km²) and Comino (2.8 Km²) and three smaller islets. The population stood at 1,172 persons per Km² in 1994 (Azzopardi, 1995).

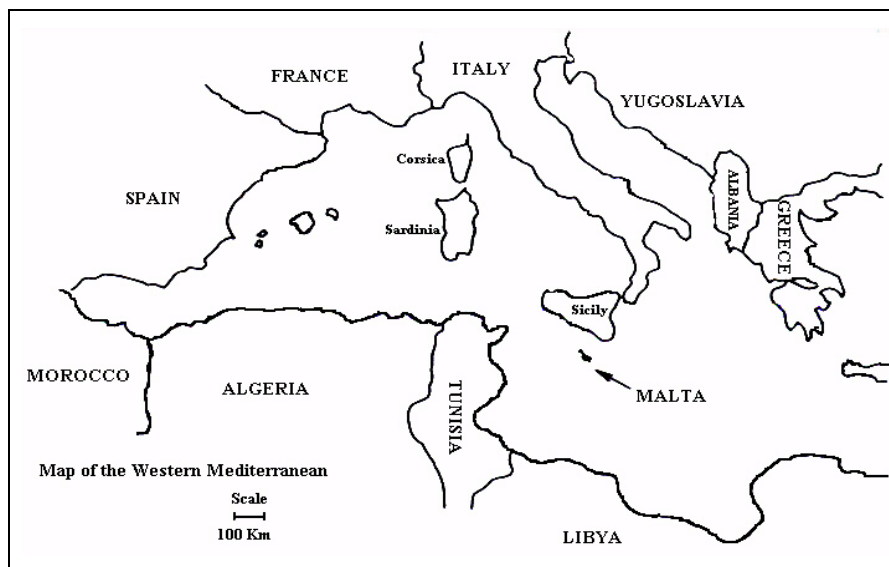


Figure 1: Map showing the position of the Maltese Islands in the Western Mediterranean (adapted from Collin Buchanan and Partners *et al.*, 1991c).

The islands are mainly composed of sedimentary rocks, mostly limestone, laid down during the Oligo-Miocene period, that is, approximately 25 million years ago. As a result of the islands being formed under water, a large number of plant and animal fossils are found in the Maltese rock. The five principle types of rock which are exposed are shown in Figure 2.

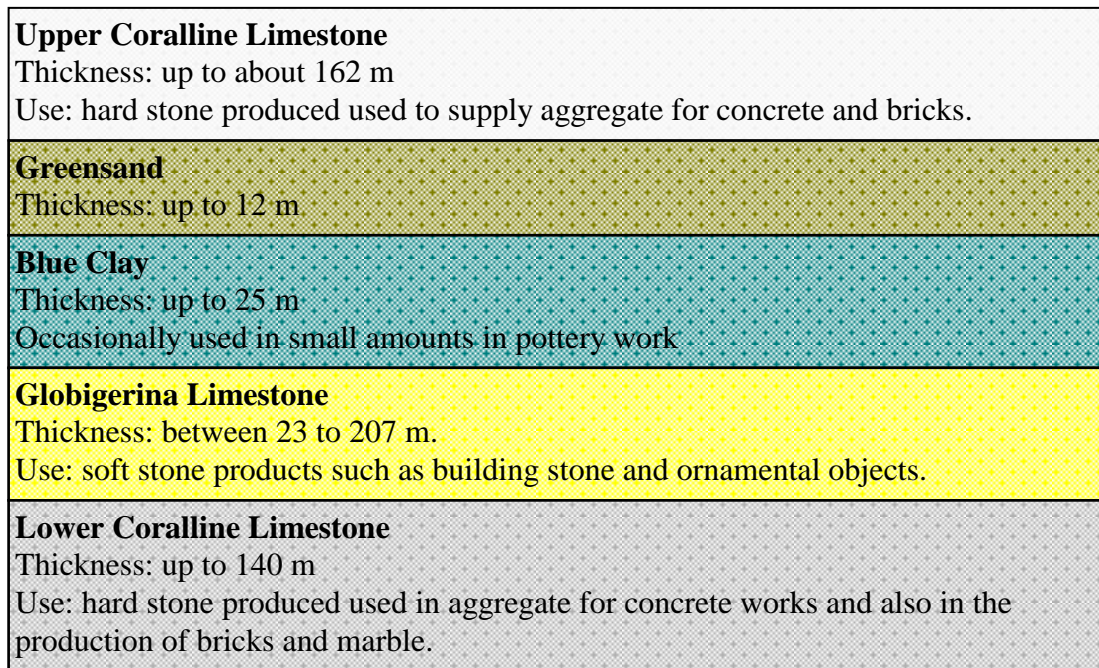


Figure 2: Schematic diagram of the different layers of Maltese rock including its age and particular use. (adapted from Sultana and Falzon, 1996; Collin Buchanan and Partners *et al.*, 1991b; Colin Buchanan and Partners *et al.*, 1991c).

The different meteorological conditions during the formation of the islands coupled with subsequent tectonic movements led to a situation where in some parts of the Island the topmost layer of the land is the Lower Coralline Limestone. This can be seen in the geological map shown in Figure 3.

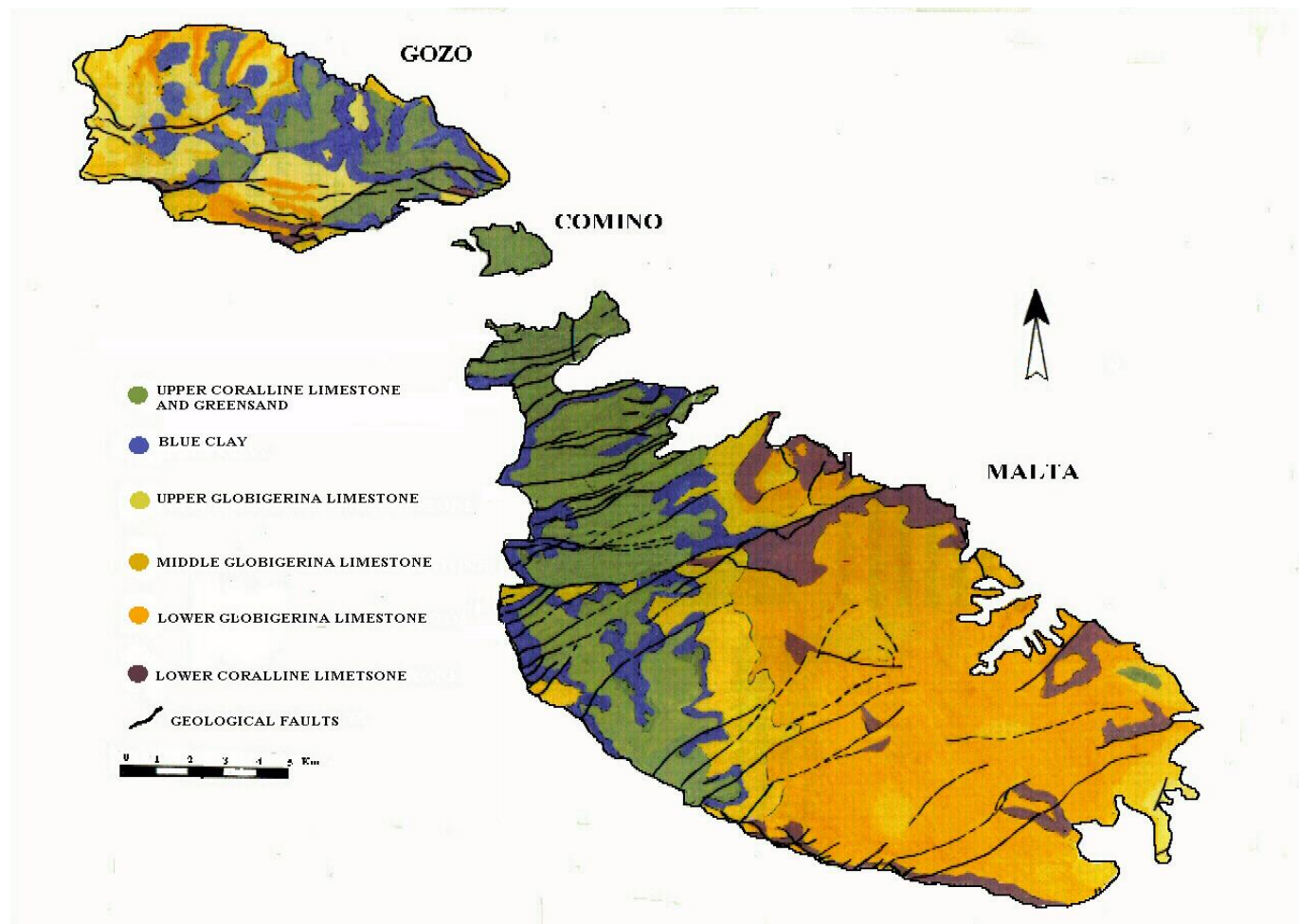


Figure 3: Geological map of the Maltese Islands showing the various exposed layers (adapted from Schembri and Baldacchino, 1992).

The Quarrying Industry

Theuma (1996) states that quarrying in the Maltese Islands has been a feature for approximately 6000 years. Limestone construction dates back to the Megalithic Temples of *Mnajdra* and *Hagar Qim* at around 4,000 BC.

The present estimated number of hardstone quarries is 27, occupying an area of about 130 ha¹ and with a workforce of about 300 people. There are 81 softstone quarries occupying an area of about 80 ha, with a workforce of about 500 mainly part timers and family members of the owner (Planning Authority, 1997).

Softstone quarries, utilising Globigerina limestone, are mainly situated in central and eastern Malta (Figure 4). The hardstone industry which uses both Upper and Lower Coralline Limestone, is located to the west of Malta as well as the north and central parts of the island (Figure 4). Open pit methods are used in both type of quarries (Photo 1). While rotary blade cutters are used to cut Globigerina Limestone into slabs (Photo 2), explosives are used to weaken the rock in the hardstone industry. Crushers are used to further break down the rock into aggregate of the required size (Photo 3).

¹ 1 ha is equivalent to 10,000 m²

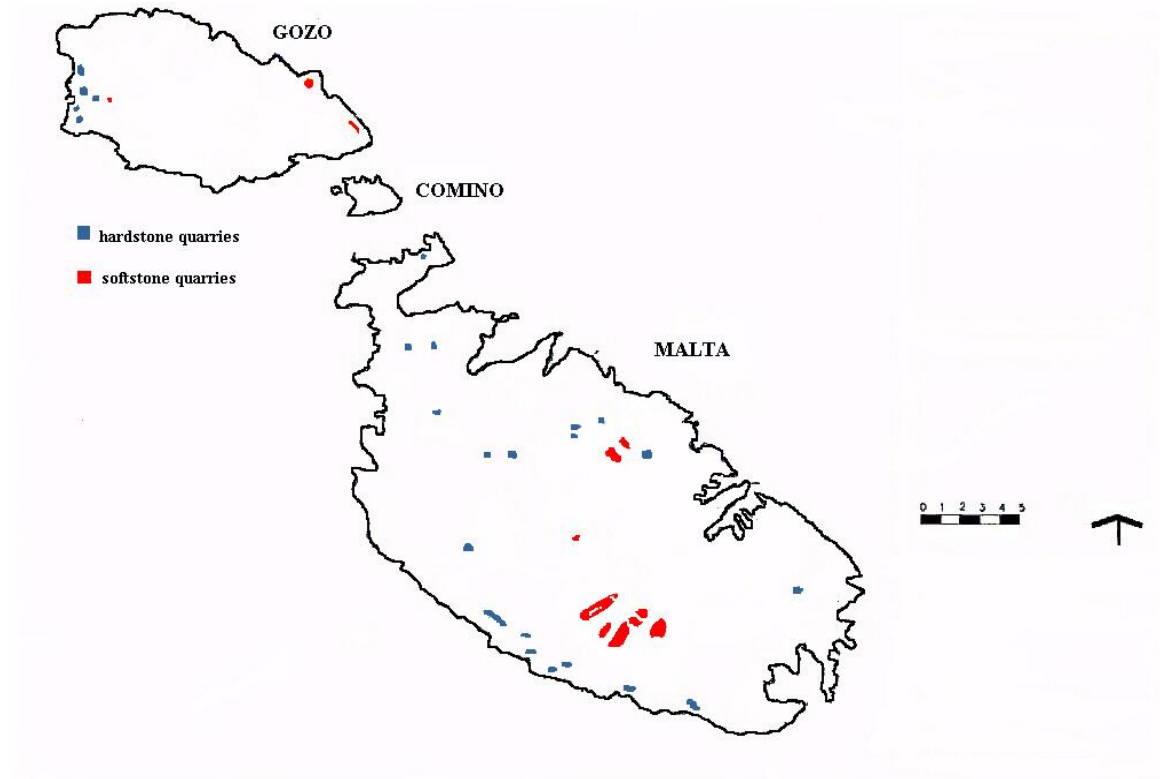


Figure 4: Softstone and hardstone quarry locations in the Maltese Islands.



Photo 1: Hardstone quarry complex showing also ancillary facilities.



Photo 2: Workers cutting softstone into a regular shape.



Photo 3: Crushers in a hardstone quarry used to break down rock into required gauge size.

Development rate

The rate of increase in building development rose dramatically after the war and between 1957 and 1985 the number of dwellings increased by 71.2 % when the population rose by just 9.5 %, and the number of households increased by 42.2% in the same period.

This building boom had collateral effects on the islands. The need for resource, that is, the building stone and concrete for roofing and bricks increased dramatically. This is clearly shown by the statistical reports collated by the Central Office of Statistics, the results of which are shown in Figure 5 and Figure 6.

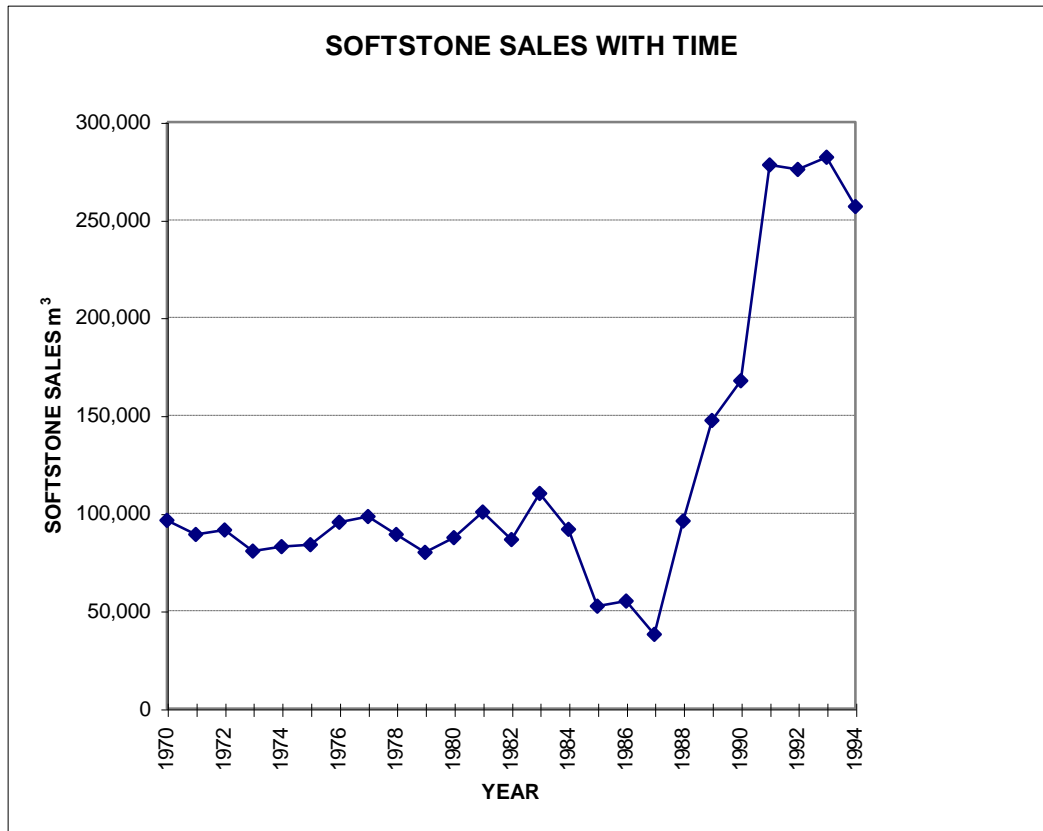


Figure 5: Graphical representation of softstone sales during the period 1970 to 1994.

(from information collected from Annual Abstracts of Statistics and Census of Industrial Production for the years 1970 to 1994).

Statistical records of production for the periods quoted show a great disparity between consumption and production. The Structure Plan Review Monitoring Report (1990-95) states that the figure of 276,750 m³ quoted by the Central Office of Statistics should read about 860,000 m³, that is, more than three times the values declared by the statistical records. This was mainly attributed to the reluctance of the quarry owners to send feedback to the Central Office of Statistics. It is stated that only 32% replied to their questionnaires.

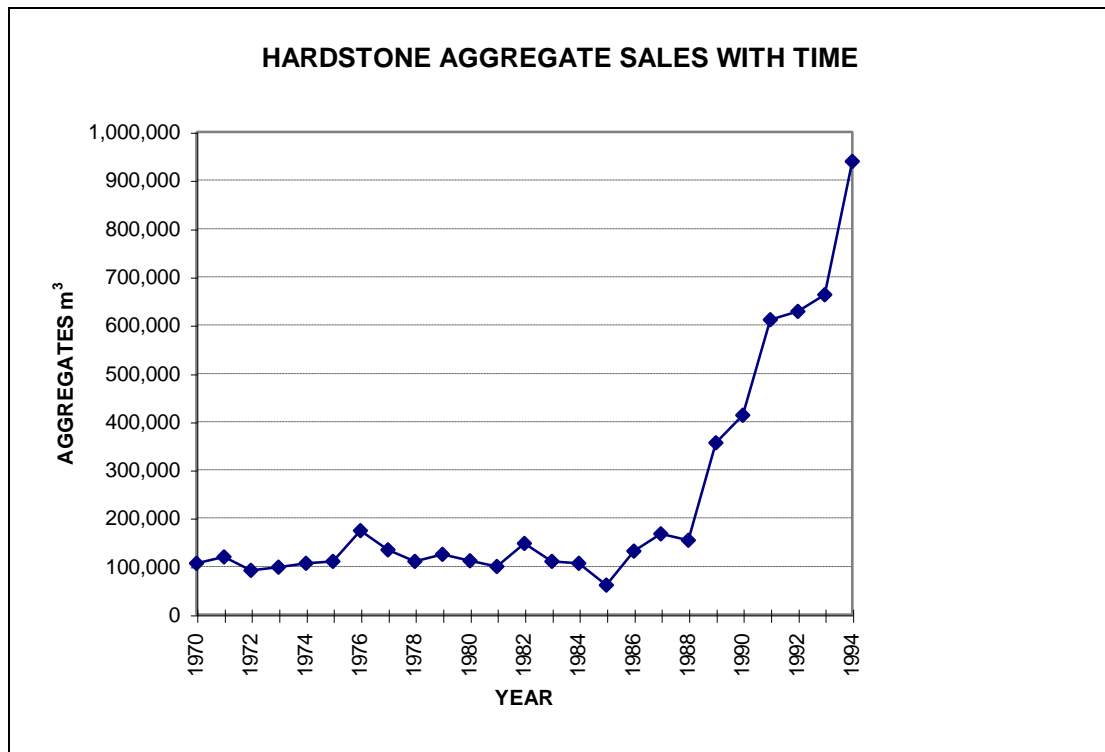


Figure 6: Graphical representation of hardstone sales during the period 1970 to 1994.

(from information collected from Annual Abstracts of Statistics and Census of Industrial Production for the years 1970 to 1994).

It is outside the scope of this report to calculate the exact quantities produced and sold, but one has to keep in mind that the quantities involved are considerable. Recycling of stone has started only very recently, and so cannot be attributed to the discrepancies found in the statistics.

It is estimated that due to the strong competition by concrete and steel substitutes in the construction industry, softstone owners are seeing a decline in demand for their products. As a result, at least 50 % of lesser quality material is being discarded (Planning Authority, 1997).

Similarly, as in the case of softstone quarries, hardstone quarry statistics are not so accurate either. The estimated production values given in the Structure Plan Review Monitoring Report (1990-1995) are in the region of 1,400,000 m³. Inert wastes generated in these quarries is claimed to be in the region of about 15 - 25 % of the gross production (Duca, pers. comm., 1998).

Legislative Planning in Malta

The Island was under colonial rule from 1800 until independence in 1964. The indelible colonial marks influenced most of the legislation throughout the years. The planning system after the war was along the lines of the British 1947 Town and Country Planning Act.

Reconstruction and economic growth saw the rapid increase in the population and the economy during the 1950s and 1960s. The initial work was done mainly by British consultants and focused on the need for zoning, containment of ribbon development and new building regulations.

The need for a development plan and planning legislation was felt in the sixties. This led to the 1969 Town and Country Planning Act, which was largely based on the British system. Unfortunately the Act never became operative. Piecemeal development schemes were the trend during the seventies.

In 1983 the Building Development Areas (BDA) Act came into effect, thus indicating the intention of the authorities to re-embrace planning. This act for the first time, allowed the development on open land. The result was a disastrous situation. Urban

sprawl and mis-use of the land were rampant. It was the cause of many a protest from environmental groups. As a result of the BDA act, the island was rapidly losing its character.

The Building Permits Act of 1988 reflected concerns that something must be done to halt the environmental decline. This was the Act which set the pathway for the Structure Plan and eventually the Planning Authority. The Planning Services Division, a governmental department within the Ministry for Development of Infrastructure, was charged with the responsibility to draw up the Structure Plan for the Maltese Islands. Funded by the European Community and with the help of British and Italian consultants, a series of reports, consultation meetings and studies were carried out. This led to the Draft Final Structure Plan for the Maltese Islands which was published in December 1990 by the Ministry for Development of Infrastructure which incorporated the Planning Services Division. The Structure Plan was finally enacted through the Development Planning Act 1992. This also created the Planning Authority and its functioning arm, the Planning Directorate, with the responsibilities to implement the planning system and the 320 planning policies outlined in the Structure Plan.

The Development Planning Act, 1992 was amended in 1997, by the Development Planning (Amendment) Act, 1997. This amendment mainly fine-tuned certain processes which were considered as bottleneck areas in the previous legislation.

1.4 Summary

This chapter started by outlining the main aims of the dissertation justifying the reasons behind the area of study by indicating their relative importance to the local situation. A description of the sequential steps followed in the report was given. The reader was placed in perspective of the local situation by:

- i. being presented with a geological formation of the Maltese Islands.
- ii. by showing the magnitude of the extractive industry and the lack of information forthcoming from it.
- iii. the considerable impacts being generated by its operation.
- iv. being given a brief historical background which led to the present planning set-up.

Chapter 2 The EIA Process

This chapter will describe the steps, legislative, procedural and in terms of Structure Plan policies that lay down the foundations of the Environmental Impact Assessment (EIA) process in Malta. Special emphasis will be given to the extractive industry. The changes envisaged for the future will also be described.

2.1 The legislative roots

The legislative roots of EIAs in Malta were spelt out for the first time in the Environment Protection Act V of 1991. Part eight of this act was specific to EIAs and included sections about their contents (article 40), conditions for exemption (article 41), information to be submitted (article 42) and notice for objection (article 43). Of particular importance are Articles 40 and 42 which state:

Article 40. The Environmental Impact Assessment shall identify, describe and assess, in every case, the direct and indirect effects on the environment, but especially and separately declared:

- a) on human beings, the Fauna and the Flora;**
- b) on the soil, water, air, climate and landscape;**
- c) on the economy and the historical heritage;**
- d) on the social environment.**

Article 42. Whosoever shall be responsible for the application for a permit to put into execution a project the environmental impact of which is to be assessed, and every head of a government department executing a project with an environmental impact, shall furnish the Minister with all requested information and especially with:

- a) a description of the project, its dimensions, design and proposed site;**
- b) an explanation of the steps taken or about to be taken to diminish harmful effects;**
- c) scientific data which serve as basis for the project;**
- d) a brief explanation of the project which explains the aim thereof. (Environment Protection Act V, 1991, p.A91)**

This is almost an exact copy of articles 3 and 5(2) from the European Directive 85/337/EEC.

Environmental Impact Assessments

When this legislation came into force, the Planning Authority was still in the conceptual stages. In fact the initial EIAs were prepared by the Planning Services Division, within the Ministry for Development of Infrastructure, with the help of Malta University Services, a subsidiary of the University of Malta and mostly utilizing professional staff at the University (Mallia, pers. comm., 1998). One must also point out that the Planning Services Division was the leading entity within the Government which was coordinating all the work with regards to the Structure Plan.

In March 1991, Dr. Jonathan Wager was commissioned by the Planning Services Division to develop procedures for a system of Environmental Impact Assessments. The final version was presented in March 1993 following a public consultation exercise of the draft report. It included a series of recommendations for the integration of EIA procedures in the development control process within the framework of the Environment Protection Act of 1991 and the Development Planning Act of 1992.

EIAs and the European Union

Wager (1993) said that the recommendations presented in his report are in line with European Community Directives². He remarked that the list of projects to be subjected to an EIA were the same as those found in Annex I and II of the European Directive 85/337/EEC. However, when one compares the report prepared by Wager, the *Policy and Design Guidance, Environmental Impact Assessment in Malta* (1993) prepared by Planning Authority and the European Directives 85/337/EEC and 97/11/EC, one notes that the new projects incorporated in Annexes I and II in the new

Directive were already incorporated in the local guidelines prior to becoming effective in the European Union. Amongst the full list of projects found in the local guidelines, one notes that wind farms, installations to harness energy from waves and sun, and fish farms were included. The differences between EU Directives and local guidelines with regards to projects' lists requiring an EIA are the threshold values. Wager claimed to consider the local situation when making his recommendations.

Wager (1993), in his report suggested that regulations should be brought into effect to formalize all the process, spelling out the various responsibilities of the different participants involved. However, to date, these have not yet come into force, but Mallia (pers. comm., 1998) confirmed that these are ready and will be published in the coming months. In spite of all this the Planning Authority still uses the Environment Planning Act, 1991, article 39 and also the Development Planning Act, 1992, S36(2) to ask for an EIA, even if the project is not listed in one of the categories of the EIA guidelines. Section 36 was fine-tuned by means of the Development Planning (Amendment) Act, 1997.

The chronology of events can be summarized as follows:

- | | |
|------|---|
| 1991 | Environment Planning Act, 1991 came into force.
J. Wager commissioned to prepare report on EIA procedures. |
| 1992 | Development Planning Act, 1992 came into force.
Structure Plan approved by Parliament. |

² At the time, Malta had formally applied to join the European Union. The new Labour Government withheld the application due to a change in foreign policy adopted by the new administration.

- 1993 J. Wager report on EIA procedures in Malta published.
- 1994 Policy and Design guidelines: Environmental Impact Assessments in Malta published by Planning Authority.
- 1997 Development Planning (Amendment) Act, 1997, amends part of Development Planning Act, 1992.

2.2 The Impact Assessment process in Malta³

Initialization

The Environmental Impact Assessment process could start in any one of the three ways shown in Figure 7. The PA⁴ can request an EIA either on grounds of policy or on the basis of the information supplied by the developer and/or that already held at its offices (e.g. GIS system). In both cases, it is envisaged that the development would have a significant impact on the environment.

Types of Assessment

The type of assessment required would be either an environmental impact statement (EIS), or an environmental planning statement (EPS) or a transport impact statement (TIS). A transport impact statement could be part of an EIS or EPS or a separate assessment.

An EIS should describe the development project, the existing environment, the likely impacts of the development on the existing environment and ways and means how to minimize and compensate these impacts.

An EPS is similar to an EIS but will normally cover fewer topics and so be less comprehensive. Secondly, an EIS requires a public meeting to discuss the findings whereas an EPS does not.

³ The account of the process is the result of an interview with Mr. A Mallia, from the Environment Management Unit of the Planning Authority. The account might not tally at some points with the Policy and Design guidelines booklet issued by the same Authority in 1994. This was mainly attributed to the lack of human resources and skills within the Environment Protection Department, EPD, whereby the Authority had to take over certain roles which were aimed to be carried out by the EPD (Mallia, pers. comm.).

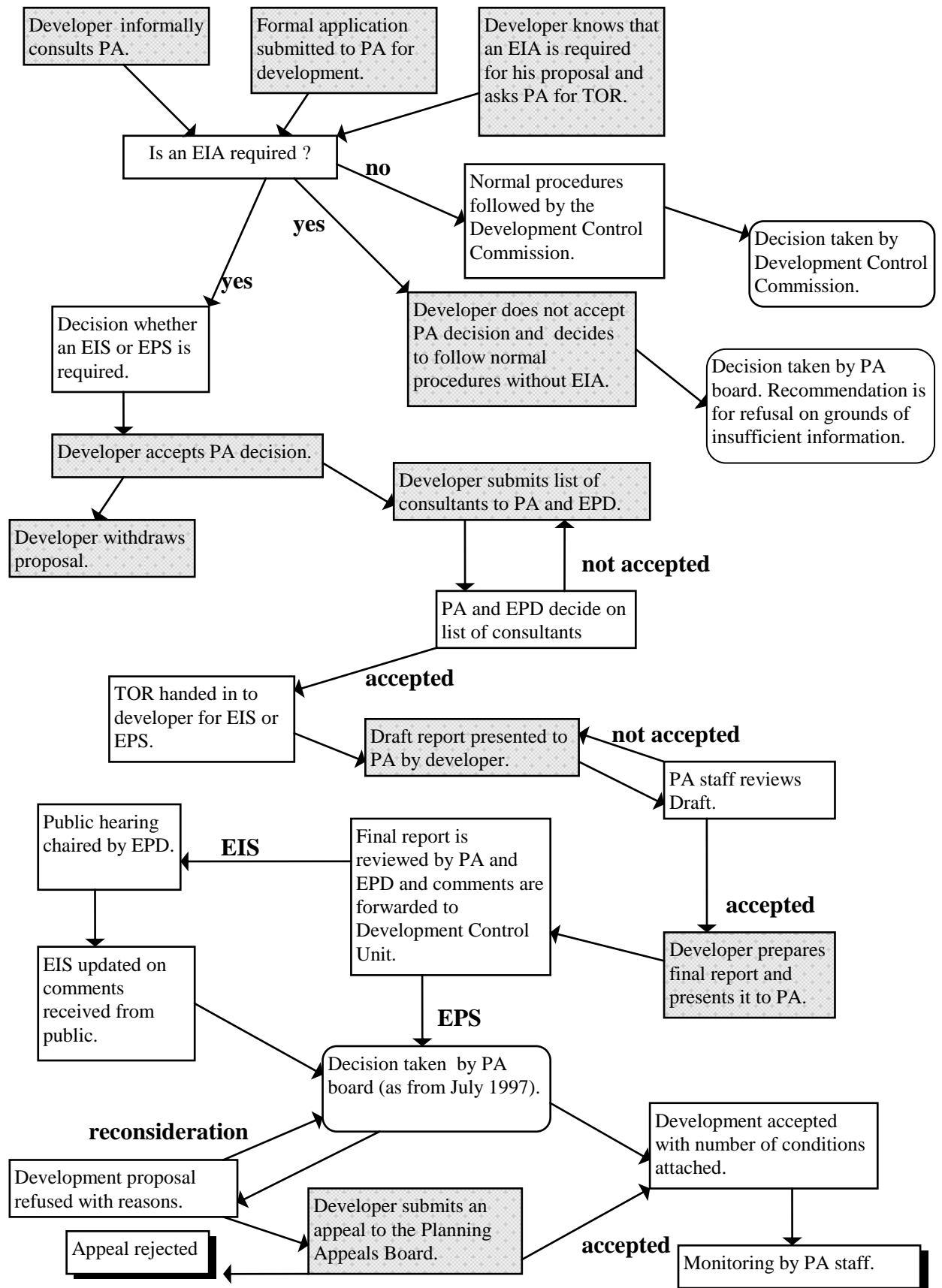


Figure 7: EIA procedures in the Maltese Islands.

⁴ The Environment Management Unit, EMU, handles EIAs within the PA.

EPS or EIS ?

Following site visits, consultation with Government agencies, including the Environment Protection Department (EPD) and available information within the PA, and information submitted by the developer, a decision is taken on whether an EIS or an EPS is required. This could also, in certain cases, be taken by using the “Schedule of projects requiring environmental assessment” given in the appendix of the *Policy and Design Guidance - Environmental Impact Assessment in Malta*. This schedule is divided into two categories. Developments falling within Category I require an EIS, whereas those falling within Category II require an EPS.

Terms of Reference

The Terms of Reference for the assessment are produced by the PA staff in consultation with the EPD and are based on all the information which would have been collated so far.

Final Report

The report submitted by the developer is circulated within the Environment Management Unit for comments. A substantial input is made by the Minerals and Wastes Unit staff, who deal with matters related to the extractive industry. Comments for refusal or conditions for approval are made and handed to the Development Control Unit, DCU, which is the Unit within the PA which deals with applications for development permission.

Development Application

At some stage during or before starting the assessment process, the developer would have submitted his application for the development, but since there is a stipulated time period during which a decision should be taken, this is suspended whenever there is some information pending from the developer. This also includes cases when an EIS or EPS is undertaken.

Decision

A decision is taken in public by the PA Board⁵, during which a presentation of the development is also held.

In case of a refusal, the developer has a right for a reconsideration or an appeal to the Planning Board of Appeals which is a quasi-judicial body independent of the PA. The decisions of the Board are final, except on points of law which may be challenged in the Court of Appeal.

Conditions of approval

In case of an approval, conditions are attached and a legally binding agreement to cover deposit of a bond is entered into. This will ensure that mitigating measures and monitoring programmes and also rehabilitation work is carried out according to plans.

Monitoring

The developer is responsible for monitoring works. However, in the case of quarries, the EMU staff monitor certain works, such as vibrations resulting from rock blasting.

⁵ Prior to the amendments to the 1992 Development Act, an EPS was decided by the Development Control Commission, DCC, whereas an EIS was decided by the PA Board.

Stipulated permit conditions are continuously monitored. Infringements could lead to withdrawal of permit.

There is no provision for a post development audit to take place.

2.3 The importance of Scoping

Scoping is the determining step, after screening, in the EIA process. Its importance lies in the fact that, the significant impacts generated by the development will be highlighted at this stage (Wood, 1996). Scoping is a multi-functional activity designed to identify key concerns at a stage when alternatives are still being considered and mitigation measures can be incorporated into project designs. Scoping provides the opportunity to highlight the benefits of projects and in some cases, opportunities for environmental enhancements can also be identified (Environment Agency, 1996).

The importance given to scoping has been denoted by environmental agencies in countries such as England and New Zealand, both of which, have issued handbooks on the subject aimed at developers, planning staff and consultants. In both cases emphasis is made to benefits of the scoping process and the importance of public consultation. The New Zealand handbook is even more comprehensive giving details of the various forms of public consultation, the importance of negotiation, conflict resolution and public review processes (Environmental Agency, 1996 and Ministry for the Environment, 1992). The European Commission has also issued a guidance book on scoping, as part of an EIA good practice series (European Commission, 1996).

Public consultation at the scoping stage helps, apart from identifying the public concerns, to increase the acceptability and credibility of the EIA and the decision-

making process. It reduces the risk of opposition emerging at a later stage, causing delays and costs (European Commission, 1996).

2.4 Scoping and the local Extractive Industry

The Environment Management Unit, EMU, within the Planning Authority are the people responsible for scoping the projects which require an EIA. In the early years this was done by different people within the Unit, depending on the nature of the project. However, lately a person has been appointed to coordinate all the work with regard to EIAs. This ensures more uniformity in issuing Terms of Reference and a standard approach to handling the significant issues (Mallia, per. comm., 1998).

Terms of Reference

In the case of the extractive industry, a standard TOR was initially set, a copy of which is found in appendix I. Applications received after 1996 had a new TOR, which are more comprehensive and better formulated than the previous ones.⁶ The PA could still ask for more information, depending on the situation in which the development fits (Mallia, per. comm., 1998). The TORs produced by the PA are also approved by the EPD prior to being presented to the developer.

The old TOR were divided into five sections namely:

- i. location of site and description of intended development;
- ii. the current and projected need for the resource;
- iii. technical justification of resources;
- iv. major impacts of the quarry and mitigating measures;
- v. quarry restoration.

⁶ The new TOR are not being considered in this study due to the fact that they have only been used in one EPS and secondly due to space constraints.

Of notable importance in these TOR is the absence for the requirement of a non-technical summary and also that of alternatives, both for sites and technologies. These issues were included in the new TOR, but the restoration section was omitted.

TOR and quality of reports

The effectiveness of the TOR is debatable. Mallia (per. comm., 1998) claimed that the quality of the reports produced initially was poor, but was slowly improving. The PA staff are trying hard to convince consultants to supply the required information as requested by the TOR, to the extent that in some cases, several draft reports are prepared and reviewed, prior to submitting the final one. This is withering the whole EIA process and consuming a lot of time and resources for the PA. The situation could possibly be attributed to the years of *laissez-faire* in planning.

EIS and EPS.....one TOR ?

One must point out that the standard use of these TOR could be slightly confusing. This is due to the fact that in the case of the extractive industry reports which will be referred to later on, there was no distinction between the use of the TOR for an EPS or an EIS.

It seems that the PA is trying to get the most out of the present situation in the quarry industry and thus attempting to raise standards and working conditions. It is using the EIA process as leverage to gain mileage to upgrade and shape up the industry using the various regulations and legislation at its disposal.

Public Participation

Public participation is absent at the scoping stage of the process. However, one must point out that once a developer submits an application for a development, this is advertised in the press and a site notice is affixed on location. People may view the application form and site plans on the development and have fifteen days to submit written representations on these applications. They can also appoint architects or civil-engineers to view the detailed plans on presentation of a written request (Art 32(5), Development Planning (Amendment) Act, 1997). The legislation only states that the Authority shall consider and decide on the objections.

2.5 Future Changes

Legislative

The Planning Authority has prepared new regulations which will be issued in the coming months, to improve the EIA process. Mallia (per. comm., 1998) said that the regulations will spell out the responsibilities for everyone involved in the EIA process. These regulations will be issued under the Development Planning Act of 1992. Amongst the areas which will be tackled are the following:

- i. Public participation in the process. The public will have access to the TOR of developments which would require an EIS. These could be changed according to public response.
- ii. EIAs would be deposited at the Local Councils for public consultation.
- iii. There will be a register of consultants who would be able to form part of the EIA multidisciplinary team.
- iv. Projects list and thresholds in the present EIA guidelines will be revised.

- v. A project description statement to be handed in prior to consultation will be mandatory.
- vi. EIA procedures will be reviewed.
- vii. There will be more accessibility to the process through the Internet.

Minerals Subject Plan

The Minerals Resource Assessment commissioned from Wardell Armstrong *et al.*, (1996, vol. I), has quantified the potential amounts of extractable material in the surveyed areas. The assessment did not consider restrictions, such as the fact that some of the areas under investigation are known to be environmentally sensitive. There is however no indication that the reserves could run out in the Structure Plan period, which is 20 years. This does not relieve the present administrative structure of the Planning Authority from its responsibilities to safeguard the resource for use by future generations. This could be achieved through the Minerals Subject Plan, terms of reference of which are currently being prepared (Planning Authority, 1997). The Plan will forecast land release requirements for mineral extraction, providing a 20 year reserve bank and rationalize supply as stipulated by Minerals policies in the Structure Plan. Measures to promote more efficient use of quarried material and strategies to encourage recycling would also be incorporated.

2.6 Summary

This chapter reviewed the legislative basis of the EIA system in Malta. It explained the whole process which any developer has to follow if his project is subject to an EIA. A flowchart of the process was produced. The responsibilities of the different participants in the process and the rights of the developer were also discussed. The general importance of the scoping process vis-à-vis environmental impact assessments was briefly highlighted. The approach utilised for the local extractive industry was mentioned. The areas which are addressed in the terms of references used in the industry were briefly addressed. The future changes which are envisaged to ameliorate the whole process were then presented in view of the local legislation and the Structure Plan policies.

CHAPTER 3 Research method

This chapter will focus on the investigative techniques used in this project. Three methods were adopted, which were:

- i. A matrix format examination of the EIAs which have been carried out so far in the extractive industry (Appendix V). This was a cross-examination between the contents of the EIAs and the TOR issued in their respect.
- ii. A questionnaire which was aimed at five different groups namely:
 - a) decision makers;
 - b) consultative group of the Planning Authority;
 - c) non-governmental organizations;
 - d) Local Councils who have extractive industries within their confines;
 - e) authors who have carried out EIAs in the extractive industry.
- iii. Interviews with key persons who are directly involved in the EIA process at the PA and also with a representative of the extractive industry.

3.1 Matrix Analysis of EIAs

The aim of using this format was not to review the EIAs but to cross check if the topics referred to in the TOR had been covered by the authors in the reports. No in-depth analysis of the reports was carried out, however a number of points were noted while reading⁷.

Matrices lend themselves very well to such a requirement. This is due to the fact that:

- i. the TOR could be presented in a summarized format;

⁷ *Special permission was obtained from the Planning Authority to view these reports only at their offices.*

- ii. there was no need to analyse the breadth and depth of the study, which are the disadvantages of matrices;
- iii. matrices can highlight areas of concern in the TOR, by noting the repetitive omission in such sectors.

Reports available

The initial impression gained from the Structure Plan Review monitoring report 1990-95, Vol. II (Planning Authority, 1997) about the number of EIAs carried out in the extractive industry was found to be different when these were seen at the PA offices. The report claimed that most of the assessments had been done and these included 4 EISs and 4 EPSs in the minerals section (Planning Authority, 1997). Only one EIS and 2 EPSs were available from this list. Mercieca (pers. comm., 1998) said that the developers had not yet presented these reports. In all, five reports were studied, two of which, had not been included in the Structure Plan Review monitoring report 1990-95 (Table 1). All reports were co-ordinated or written by architects, using TOR prepared by the PA.

Methodology

The information in the matrices was recorded using a “1” and “0” key and, where the area was not applicable to the TOR, a N/A sign was included. Overall scores for each report were compiled. This showed the total number of applicable TOR items which were covered in each report. A total percentage score was worked out for each applicable item for all reports. This indicated the areas which were not being tackled in the reports.

It is important to note at this stage, that a “1” score was granted even if the subject area in question was covered at the barest minimum level.

Report No.	1	2	3	4	5
TOR	old	old	old	old	old
Type of report	EPS	EPS	EPS	EPS	EIS
Quarry extension	soft stone	soft stone	hard stone	soft stone	hard stone
Date of report	March 96	November 95	February 97	Not Available	December 96

Table 1: Summary of reports under investigation.

3.2 Questionnaire

The aim of the questionnaire was to ask a specific number of questions to a selected group of people who are, or were at some point related to the EIA process.

Advantages

The reasons for using this method were:

- i. questionnaires are cheap to produce and run (Bourque & Fielder, 1995);
- ii. one can contact a selected number of people at the same time;
- iii. one can ask the same questions to different people in the same manner and under no influence from the person asking the questions;
- iv. the perceptions of different groups of people could be analysed concurrently;
- v. more questions could be answered in a shorter time than in interviews;
- vi. respondent could be contacted directly when s/he opens the mail. This avoids problems of appointments between interviewer and respondent and also problems with availability of time for respondent. The questionnaire could be answered at his/her own free will;

- vii. respondents have time to think of an answer or go back to it later on;
- viii. surveyor could limit respondents' answers by limiting writing space, therefore avoiding elaborate answers;
- ix. questionnaires allow for a standard approach of analysis.

Disadvantages

Questionnaires have their limitations, which must also be considered in this context.

These can be summarized as follows:

- i. Questionnaires depend much on the respondents' motivation.
- ii. One has to restrict oneself to a substantial number of closed questions, otherwise it would be impossible to analyse and compare results. This restricts the ability of the respondent to broaden an answer.
- iii. There is no control on the question sequence answered by respondent. This is due to the fact that the respondent could first read through all the questions answering the easy ones and find answers or hints in other sections of the questionnaire, thus producing "contaminated" results.
- iv. Respondents may try to ask questions to knowledgeable persons so that they will be able to give an answer, thus showing themselves in good light. This defeats the whole scope of the questionnaire as regards the lack of information or knowledge by some of the respondents.
- v. Questions set could not be fully understood by one and all in the same manner. This highlights the importance of testing the questionnaire by means of a pilot survey.
- vi. There is no opportunity to probe any further the answers supplied by respondent.

vii. There is no control over who actually has answered the questionnaire.

Structure of Questionnaire

The basic questionnaire which was sent to all respondents consisted of seventeen questions. This was sent to the PA and DCC boards, which are the decision making boards. It was also sent to the Minerals Board, which is a consultative board to the PA and DCC. The same number of questions, plus a number of supplementary ones were sent to the authors who have carried out the EISs and EPSs in the extractive industry, a number of recognised NGOs and to the Local Councils who have quarries within their confines. All the questions including the different supplementary ones are found in appendix II.

Issues studied

The general section of the questionnaire concerned:

- i. the areas of scoping and the TOR issued by the Planning Authority;
- ii. EISs and EPSs including contents, methodology, grading and opinions on possible changes which could be introduced;
- iii. role of PA (*to all groups but NGOs and Local Councils*) and an open-ended question where respondents could add other comments.

The questionnaire mainly focused on a number of technical issues which might not be familiar with all the respondents. Great care was taken, to make it as user-friendly as possible and define certain technical terms which were used and could create some difficulties.

The bold typed introduction clearly stated that the questions concerned solely the extractive industry and the answers were to concentrate on that issue.

Most of the questions were closed, just requiring a yes or a no answer. In others, a number of possible solutions were given and respondent was asked to reply accordingly. A few open-ended answers left some leeway for the respondents' opinion to be expressed. Limited space was given so as to restrict protracted answers.

Each questionnaire terminated by thanking the respondents for their collaboration in the study.

Supplementary Information

The questionnaire included a section whereby some personal information was collected. This included details of occupation, relatives in the extractive industry and visits made to a quarry site. The name and contact phone number was also asked for.

The supplementary questions for NGOs concerned the possibility of consultation and disclosure of available information and also the present impacts of the industry and its future role.

Local Councils were asked about the public perceptions and problems which this industry causes in their locality and also the impacts they think it generates.

Authors were asked a question about the impacts the industry generates and the problems they encounter when carrying out an EIA report.

Management of Questionnaire

The limited number of potential respondents restricted the possible use of a pilot survey to analyse the questionnaire. So the opinion of a person who is familiar with locally run surveys and questionnaires was requested and some adjustments were also made.

Groups studied

The questionnaire was sent simultaneously to 84 potential respondents which were made up as follows:

- i. 21 Mayors of Local Councils.
- ii. 18 non-governmental organisations.
- iii. 8 persons on the Minerals Board.
- iv. 32 people who have either served or are serving on the PA or DCC boards.
- v. 5 authors.

Questionnaire Pack

The envelope included a copy of the questionnaire, a self-addressed stamped envelope and a covering letter (appendix III).

The covering letter which was personalised, stated:

- i. the purpose of the study including the title of thesis and the University attended;
- ii. the groups of people to whom it is aimed;
- iii. the target date (in bold) by when the questionnaire should be returned;
- iv. a phone number where the respondent could contact the author.

The letters were sent on Monday 12 January, 1998, giving the respondents until January 23rd to answer. With the exception of three board members who are employed at the Planning Authority, all the letters were sent to the home addresses of respondents.

Reminder

A reminder (appendix IV) was sent to 78 people on Friday 23rd January, 1998, so that it would arrive by the weekend with the possibility of an increase in responses. A contact telephone number was again incorporated and a second target date, Friday 30th January, 1998, was set.

On Wednesday and Thursday the 28th and 29th January, 1998, respondents who had not yet sent in their answers were contacted personally by phone. Many promised that they will try their best to send the answers by the end of the week.

The answers were collected within a period of three weeks. This approach was adopted so as:

1. to limit cases where respondents would lose their copy, or leave it somewhere due to the fact that the receiving date was weeks ahead of the target date, thus losing immediate interest in it;
2. through two successive reminders, the importance of the respondents' answers, were denoted;
3. through the inclusion of the respondents' phone number, the author could clear any queries for the answers given;
4. through the use of a personalised letter, an individual approach to each and every respondent was given. This seems to have been successful, because

some respondents thought they had only received it on a personal basis and not because they formed part of an organisation or board. This could have helped in the motivation to answer the questionnaire.

Coding of Questionnaire

A code number for each standard type of answer for the closed questions was developed. This facilitated inputting and processing of data on computer. There were few if any problems with this method with the closed questions. The difficulties arose with the open-ended ones. This was due to the fact that one had to understand what the respondent wanted to say and try to generalise it to fit within a similar framework answer. Otherwise a new code had to be introduced. Great flexibility was required to limit the number of different codes, as much as possible. A code book was thus developed for all the open-ended questions. This book was utilised to process all the questionnaires immediately upon the arrival of each questionnaire.

Due to the fact that some of the supplementary questions for the authors, local councils and NGOs had different question numbers, these were renumbered solely for processing purposes.

3.3 Interviews

The necessity for using interviews stemmed from the fact that this is considered as the most appropriate method of collecting data (Moser and Kalton, 1971). A semi-standardized form of interview was chosen. This was found very convenient because a number of structured questions were planned and where the answers given required more elaboration, more in-depth questions about the subject, were asked. This was

possible because the author was the interviewer. Interviews were found to be the best way to approach a person and elicit a certain amount of up-to-date information about the subject.

Advantages

Interviews have an advantage over questionnaires in the fact that:

- i. one can identify the respondent;
- ii. any difficulty could be cleared up immediately by a supplementary question or by rewording the question;
- iii. one could also judge the honesty of the respondent during the interview and how well prepared he or she is about the topic in question;
- iv. more open-ended questions could be asked;
- v. the interviewer could command the interview by controlling the respondents' answers, especially in cases where the respondent is willing to continue talking about irrelevant items to the interviewer;
- vi. there is the advantage that interviewers could reword the questions or skip certain questions which came up during the interview;
- vii. the respondent doesn't know the questions which will be asked and so cannot give "contaminated" answers;
- viii. the subject could be investigated deeply.

Disadvantages

Interviews hold a number of disadvantages which have to be given due attention and weight. These could be listed as follows:

- i. One has to devise a suitable means of recording responses. If one is to write down responses, this has to be in abbreviated form. Some information could be missed as a result.
- ii. Interviews could take longer than envisaged as respondents could have other things to do and may have to terminate the interview. This gives time for the respondent to ponder on the interview, thus altering conditions of interview the following time.
- iii. Respondent would not like to divulge certain information due to the nature of his work and so limits the information given.
- iv. Due to the number of open-ended questions and the unstructured manner adopted one cannot analyse interviews in a similar manner to questionnaires. Hence, the scope for using them should be different from that of a questionnaire.
- v. Interviews are more time consuming.
- vi. Appointments between interviewer and respondent could be difficult to make due to tight schedule of both parties.

The information collated during the interviews was not processed in any standard manner, but was utilized throughout the whole study. The scope of the interviews did not require such an approach.

3.4 Summary

This chapter concentrated on the three investigative methods used during this project. The key groups of study were also mentioned and the approach justified. The scope of each method was also justified. The merits of each methodology was briefly described

and referenced where necessary. The analytical procedure in each case was also depicted, justifying the different approaches utilized.

Chapter 4 Results

This chapter will start off with an overview of the EIA reports studied. It will be followed by an investigation of the results obtained for the analysis of the Environmental Impact Assessments (EIAs) making use of the Terms of Reference (TOR) utilized.

The second part of the chapter will study the results obtained from the questionnaire. A general analysis ensued by a more detailed one concentrating on the scoping methodology and the contents of EIAs will follow. The chapter will end with an analysis for questions asked to specific groups of respondents.

4.1 Analysis of Reports

The EIA reports have been numbered 1 to 5 for confidentially purposes.

Table 2 and Table 3 give detailed information about the quarries and their respective EIA reports and should be consulted while reading the following paragraphs.

Report 1 was written by one author and showed no indication of any expert advice in the different topics which were discussed. Of notable importance was the inclusion of a non-technical summary which was not requested in the TOR.

Report 2 was one of the shortest (3 pages) and oldest reports from those analysed and concerned the re-opening of an old quarry using modern machinery.

Report 3 was about an old hard stone quarry, whereby an application for a health farm had already been turned down on grounds that it would sterilize the mineral resources

left in the area. The site is presently utilized for crushing stone and producing aggregate. The report produced by a multi-disciplinary team was well prepared but the fact that it consisted of the collation of a number of separate reports led to a substantial amount of repetition whilst reading the document.

Report number	1	2	3	4	5
Site surface area / m ²	4797	N/A	21,200	N/A	33,740
Mineral Capacity / m ³	263,700	N/A	63,600	N/A	390,000
Annual production / m ³	15,600	N/A	50,000	N/A	N/A
Operation time / years	16	N/A	1.27	N/A	N/A

Table 2: Site surface area, mineral capacity production levels and approximate production life time of site.

Report 4 was a two page report compiled by one person. It was basically a laboratory report about the resources present on site.

Report 5, which was again written by a multi-disciplinary team, concerned the re-opening of a relatively large quarry (3.37 ha). The report was made up of a pre-amble and a coordinated assessment followed by a number of individual reports. A restoration scheme was also included, but lacked detail.

Contents studied in Reports

The five reports under study utilized the old TOR, which covered 78 different topics.

The results are shown in Table 3.

Report number	1	2	3	4	5
TOR	OLD	OLD	OLD	OLD	OLD
Compilation of report (MDT-multi disciplinary team; 1-author)	1	1	MDT	1	MDT
Type of report	EPS	EPS	EPS	EPS	EIS
Quarry type (SS: soft stone; HS: hard stone)	SS	SS	HS	SS	HS
Number of items in TOR	78	78	78	78	78
Number of items not applicable to site	10	0	4	10	6
Number of items applicable to site	68	78	74	68	72
Number of items incorporated in reports (percentage)	28 (41.2%)	12 (15.4%)	42 (56.8%)	19 (27.9%)	51 (70.8%)
Number of items not incorporated in reports (percentage)	40 (58.8%)	66 (84.6%)	32 (43.2%)	49 (72.1%)	21 (29.2%)

Table 3: Comparison of contents in EIAs to that expected as per TOR.

Report 5 was the only EIS report compiled for the industry.

The general concern arising from these results is that in spite of the guidelines being issued and that in some cases, a number of draft versions of the reports were presented to the PA, (Mallia, per. comm., 1998), there are still a significant number of items which were not covered in the final reports. If one assumes that the TORs should highlight the significant impacts and analyse them, then one can conclude that the aim of the EIAs is practically being defeated from the start.

Detailed analysis of reports

The results comparing the reports with their TOR can be found in appendix V.

The analysis will be divided into five different areas as per TOR (appendix I) used. A percentage value of applicable items covered was calculated for each topic for the five different reports.

Present Location

The first area of analysis, as per *Terms of Reference, Environmental Impact Assessment, Hardstone quarry* concerned Present Location which is item 2.0. This is subdivided into 8 units (number 2.1 - 2.8) which, for the purpose of this analysis were further subdivided as shown in Table 4.

The results reveal that most of the Social Constraints section was only tackled in the EIS reports. However, this lacked hard facts and was imbued with personal assumptions. This might be due to lack of information and/or knowledge in the area.

A number of items of basic importance, such as legal status, ownership and site maps of definite scale, were only studied in two reports. In the latter case, some reports included site plans with the wrong scale or no scale at all. Mallia (per. comm., 1998) stated that some of the missing information could have been given under a separate cover and could be included in the file⁸.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
2.0 Present Location	
2.1 Site description	
· present land use	100%
· legal status	40%
· ownership	40%
· features on site	80%
· 1:500 site plan	40%
2.2 Geology	
· formation	60%
· quality	80%
· quantity to be worked	40%
· hydrology related problems	60%
2.3 Ecology	
· Desk & field studies	
flora ID	40%
fauna ID	40%
· effects on flora & fauna	80%
· mitigation measures	40%

⁸ It was beyond the scope of this project and beyond the parameters established by the PA for me to look up for further information in individual files.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
2.4 Existing trees & woodland	
· 1:250 site plan (tree/wood survey)	100%
· species shown (trees >1.5m h [incl. diameter])	100%
· natural regeneration (trees <1.5 m)	100%
2.5 Archaeology (500m diameter range)	
· location (historical/archaeological buildings)	67%
· siting vis-à-vis project	67%
· stability	50%
· impacts generated from project	67%
2.6 Landscape & Visual Assessment	
· area & degree of visual intrusion	60%
· potential impacts on areas of Nat./man-made beauty (photomontages [min.3])	60%
· Social Cost benefit analysis	40%
· compare Social Benefits from extraction	20%
employment/	20%
incomes generated	20%
· with Social costs	
environmental/	20%
cultural/	20%
ecological/	20%
landscape damage	40%
2.8 Other planning constraints	
· rock transport routes	80%
· soil & soil handling techniques	67%
· plant allocation	25%
· storage of aggregate	80%
· others (name)	20%

Table 4: Percentage of applicable items covered in EIA reports according to the old TOR, falling under the sub-heading *Present location*.

The geology of the area was treated vaguely in some of the reports by using terminology such as “good rock quality” without giving any scientific evidence. Most failed to quantify the volume of rock to be worked. Similarly, the ecology of the area was only tackled in two reports through the use of desk and field studies. Mitigation measures were also included.

With the exception of one item, the archaeological section was only applicable to three sites. One of the reports completely ignored this section.

Only one report dealt with the Land and Visual Intrusion section in a comprehensive manner, through the use of an excellent photomontage of the area. Other reports limited themselves to unlabelled photos accompanied by a short description.

The main concerns from the section entitled Other Planning Constraints were two, the first being that of *rock transport routes* and the second sub-titled *other planning constraints*. Most of the reports studying the rock transport routes focused their study on the quarry zone area, where the impact is of an expected nature. The reports were done in a superficial manner, avoiding any detail.

The only report which studied another constraint not mentioned in the reports, evaluated noise impacts on the surroundings. This was done by a person claiming to be a court expert. The methodology adopted and climatic readings of the day were not included. This resulted in a poor outcome and dubious conclusions.

Need for Resource

The second area of analysis, concerns the Need for Resource which is item 3.0 in the TOR. This is subdivided into 4 units (number 3.1 - 3.4) which, for the purpose of this analysis were further subdivided as shown in Table 5.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
3.0 Need for Resource	
3.1 Need for resource	
· current/projected end users	80%
· related applications	40%
· competitive advantage over other sites	0%
3.2 Choice of extraction method as against alternatives	

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
· method of extraction (most suitable)	20%
· advantage of this method over rest	20%
· cost benefit analysis of this against alternatives	0%
· justification of choice	20%
3.3 Intended use of aggregate	
· list of size of product/s	0%
· list quantities of each size	0%
· areas of consumption of produce	60%
· CB analysis of income against impacts	20%
3.4 Extent of quarry waste	
· quantitative estimate of waste	0%
· method of disposal of inert waste	20%
· method of disposal of other waste	40%
· location of disposal of waste	40%
· transport method of waste	20%

Table 5: Percentage of applicable items covered in EIA reports according to the old TOR, falling under the sub-heading *Need for Resource*.

This section was poorly treated in most reports. Some of the authors stated that the need for resource was obvious and so did not give it much importance. The EIS report was the only one which treated some of the items in a comprehensive manner. However, a number of items which required quantitative estimates or projections were completely disregarded in the reports.

The information required for this section of the report should have been readily available without much effort. This is due to the fact that in all cases, the reports concerned either the re-activation of an old quarry site or an extension of an existing one.

Technical justification of Resource

The third area of analysis, concerned the Technical justification of resource which is item 4.0 in the TOR. For the purpose of this analysis it was further divided into seven parts, as shown in Table 6.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
4.0 Technical justification of resource	
· rock sampling & testing (BS812) marked on photos	40%
· number of samples (min. 8)	40%
· relative density	20%
· water absorption	40%
· aggregate impact value	50%*
· aggregate crushing value	50%*
· copy of result from competent engineering body	40%

Table 6: Percentage of applicable items covered in EIA reports according to the old TOR, falling under the sub-heading *Technical justification of resources*.

* concern only two reports.

60 % of the reports did not consider this important item. When considered, both in the case of hard stone and soft stone, it was done in an extensive manner and in great detail. In the case of soft stone the results of another three tests were also incorporated. From these tests one could have a good idea of the type of material to be excavated, hence the importance. Its related use will also depend from these results.

Major impacts and mitigating measures

This is the fourth area of analysis and is found as item 5.0 in the TOR. It is divided into four parts which were further subdivided for the purpose of analysis. Table 7 shows the results obtained.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
5.0 Major impacts & mitigating measures	
5.1 Environmental	
· noise pollution	40%
· dust pollution	40%
· control of such pollution	60%
5.2 Cultural & visual	
· archaeological	33%*
· historical	33%*
· access to adjacent sites	60%
scenic	60%
historical	33%*

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
5.3 Ecology	
· fauna	60%
· flora	60%
· access to sites of ecological importance	25%*
5.4 Landscape	
· assessment of site characteristic views	80%
· ways of mitigating present & envisaged impacts	100%

Table 7: Percentage of applicable items covered in EIA reports according to the old TOR, falling under the sub-heading *Major impacts and mitigating measures*.

* not applicable to all reports.

The main area of concern arising from these results was that related to the *environmental* section. The control of pollution and the impacts of dust and noise were treated lightly, lacking a sound scientific base. Controlling these impacts was limited to tree planting in one case and spraying with water, to reduce dust, in another.

Restoration

The final part was that dealing with the Restoration of the site. The results are shown in Table 8.

Topics referred to in the TOR for EIAs in the extractive industry	Percentage of applicable items covered in EIA reports
6.0 Restoration	
6.1 Envisaged site re-use	
· restoration scheme	80%
· assess social & economic value of such scheme on immediate surroundings	20%
6.2 Tree cover	
· tree planting programme (within 15 yr. of planting)	40%
· planting locations	40%
· tree types/species	40%
· management of scheme	40%

Table 8: Percentage of applicable items covered in EIA reports according to the old TOR, falling under the sub-heading *Restoration*.

The social and economic value of a restoration scheme were only attempted in the EIS. However restoration schemes were designed in all but one of the reports. Details varied as regards to the tree cover to be used.

One must consider that this is something new to the islands and such a planning requirement seems hard to visualize.

4.2 Questionnaire⁹

The questionnaires which were analysed were those received by the closing date after the second written reminder. Late questionnaires were not included in the analysis. The results obtained for the questionnaire were within a 90 % confidence level. This implies that the results should be considered within + 10% accuracy level.

The percentage respondents from each group is shown in Figure 8. With the exception of the authors' group, in all cases the response rate superseded 50%.

⁹ The raw results obtained for this questionnaire are not incorporated due to space constraints. Anyone wishing to obtain a copy could contact the author through the EIA Unit.

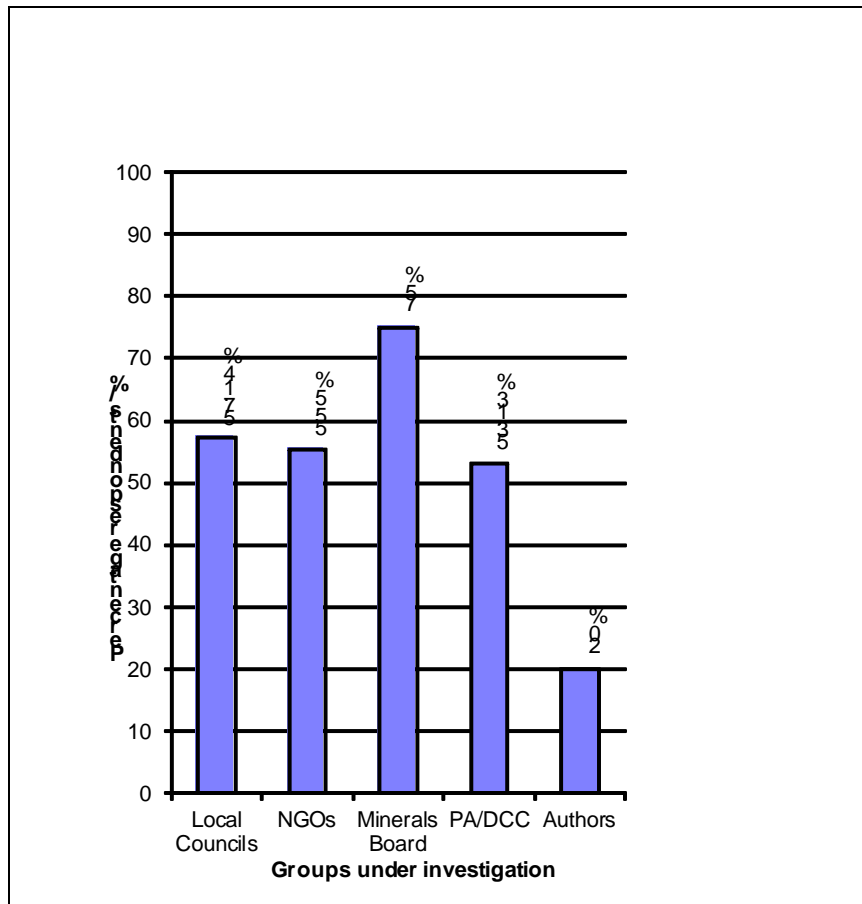


Figure 8: Percentage respondent from each group to whom the questionnaire was sent.

Background of respondents

The overall composition by group, when viewed collectively, can be seen in Figure 9.

One may note that, with the exception of the authors, each group maintained approximately the same proportional share, when comparing the respondents' sector to the original sector.

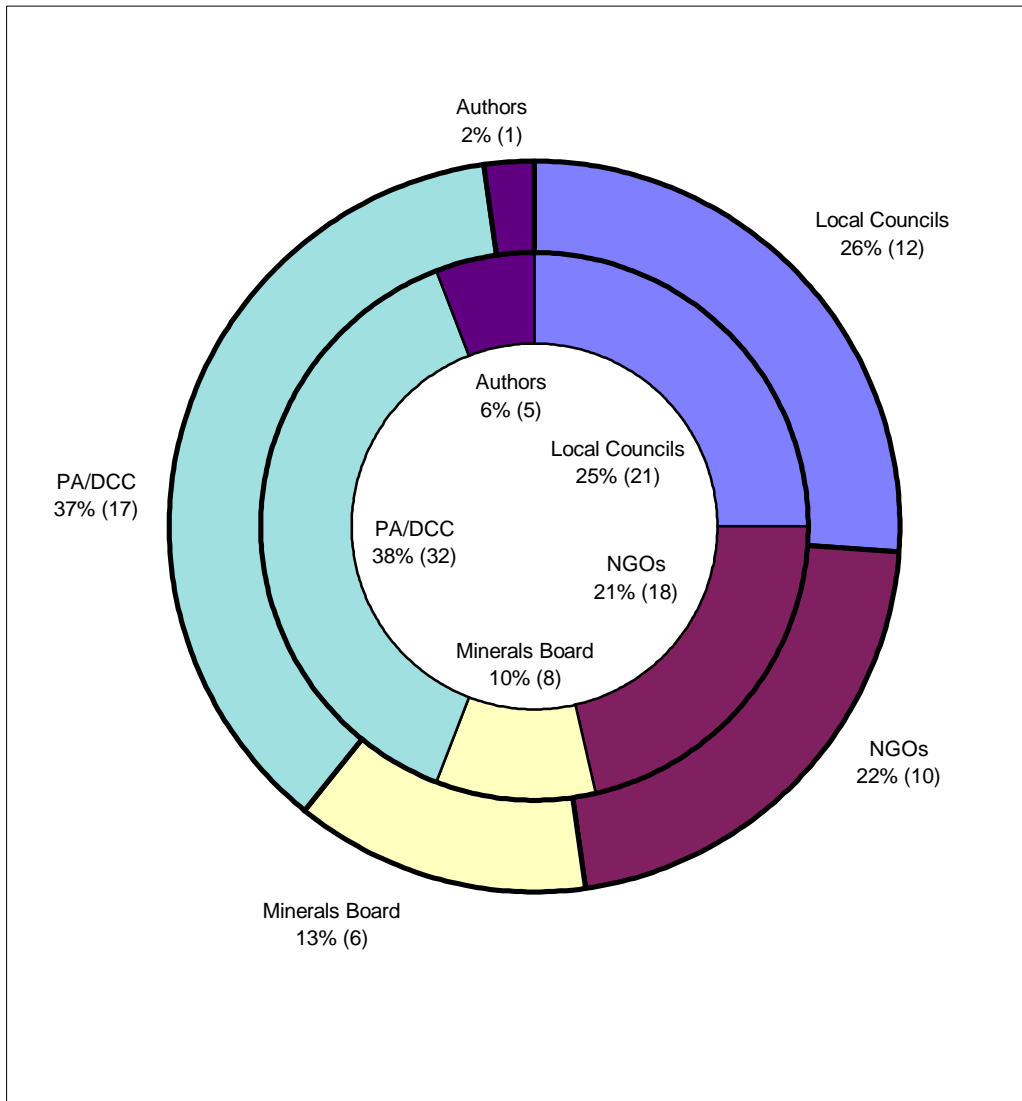


Figure 9: Percentage composition by group, of questionnaires sent (*inner circle*), compared to respondents (*outer circle*).

The respondents consisted mainly of professional people, that is, people holding a University degree, managers and people at a supervisory level of employment. A breakdown of respondents by profession is found in Figure 10.

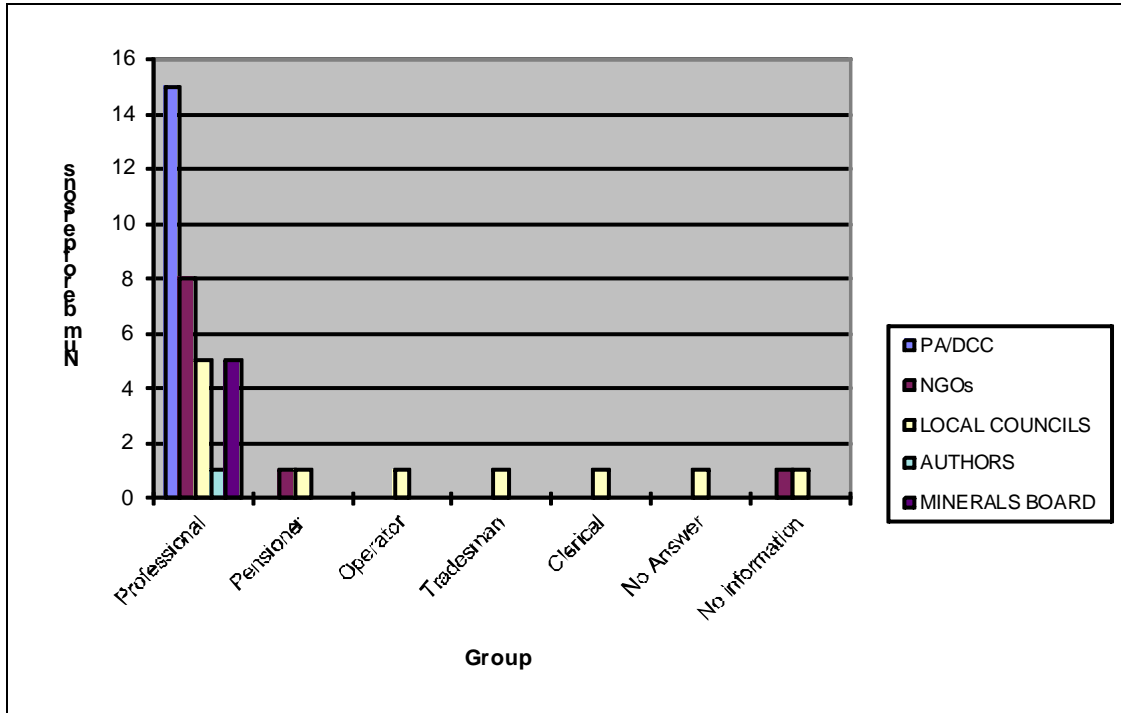


Figure 10: Occupation of respondents, by group.

77 % of the respondents have been to a quarry, with the majority (53 %) having been to both a soft stone and a hard stone one. This is shown in Figure 11

Out of the 46 respondents, 3 claimed not to be able to fill in the questionnaire due to lack of knowledge in the subject. Other respondents left parts of it unanswered or claimed to be unable to answer.

For all the questions which were addressed to all groups, that is, questions 1 - 16, all the answers will be treated collectively. Unless otherwise stated, the percentage given for each group will always be an overall one.

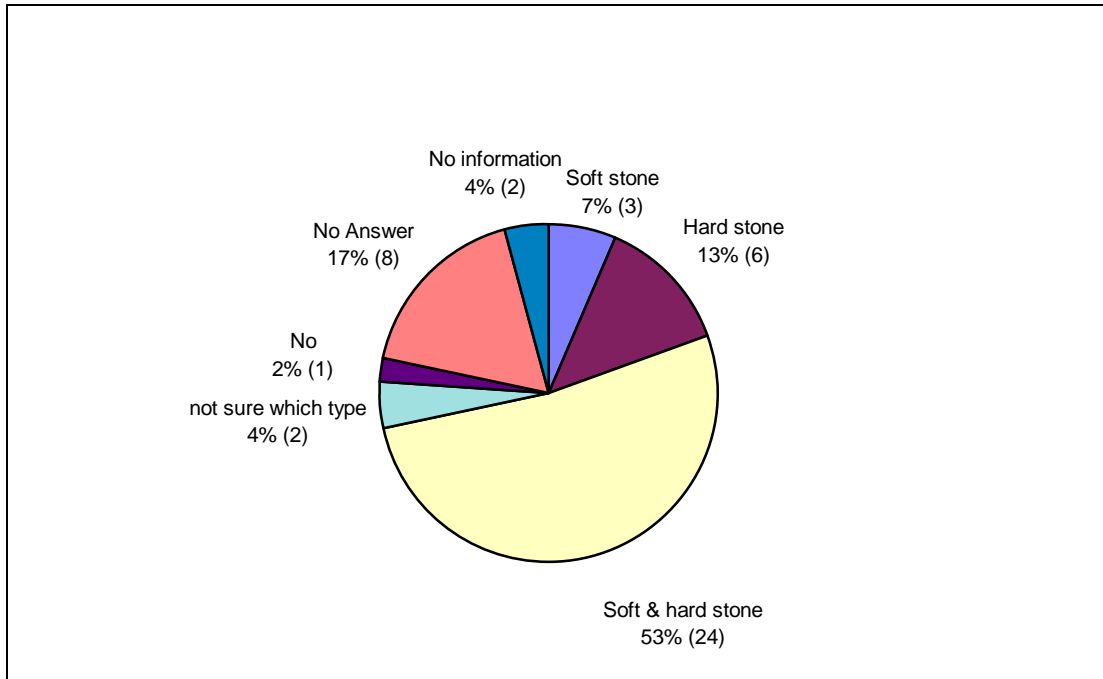


Figure 11: Percentage of respondents who have been to a quarry (soft or hard stone).

Terms of Reference

The first part of the analysis deals with questions related to the Terms of Reference, TOR, that is questions 1 - 6 (see questionnaire, appendix II).

	No / %	Yes / %	No answer / %	No available information/ %
PA/DCC	17.3	10.8	6.5	2.2
Minerals Board	4.3	8.7	0	0
NGOs	17.4	0	0	4.3
Local Council	19.6	4.3	2.2	0
Authors	0	2.2	0	0
Total	58.7	26.1	8.7	6.5

Table 9: Have you read the TOR ?

The answers (Table 9) to the first question show that the TOR are unknown to most of the groups studied, even at decision level (PA/DCC).

In spite of the fact that 58.7 % of respondents claimed not to have read the TORs, it was only 2.2 % who did not agree with the approach taken by the PA in issuing standard TOR for the quarry industry (Table 10).

No / %	Yes / %	No answer / %	No available information / %
2.2	58.7	32.6	6.5

Table 10: Do you agree with the TOR approach taken by the PA?

The reason given for *disagreement* with the adopted approach was that some of the TORs needed refinement.

The most popular reasons given by those who *agreed* with the present approach centred on the fact that:

- similar developments carry similar problems and therefore a uniform approach should be adopted;
- it is a comprehensive method and acts as a common starting point for the reports;
- the approach provides a control mechanism and avoids discrimination;
- it renders the planning process more efficient;
- it follows TOR which were proved effective abroad;
- it should act as a basic format and be modified accordingly on a case by case basis.

The last part of question 3 cross-checked the responses given by respondents, because it was the same question asked in a different way. With the exception of one local Council, all gave the same answers.

Calibre of TOR

Amongst those respondents who had read the TOR:

- 75 % thought that they provided sufficient guidance to produce a good quality report;

- 50 % thought that they were not too detailed to produce a good quality report;
- 50 % disagreed that the requirements couldn't be met by any developer;
- 50 % disagreed that they provided insufficient guidance.

All the results are shown in Table 11.

	No / %	Yes / %	No answer / %
..... sufficient for good quality report	0	75.0	25.0
..... too detailed	50.0	25.0	25.0
.....impossible to be met by developer	50.0	16.7	33.3
..... provides insufficient guidance	50.0	8.3	41.7

Table 11: Do you think that the TOR for the quarry industry are..... ?

Separate Scoping

The fourth question tried to analyse the possibility of having a separate scoping exercise for each application thus leading to tailored TOR. 52.2 % agreed with this approach with more than 25 % either not responding or not answering due to lack of information. Results are shown in Table 12.

No / %	Yes / %	No answer / %	No available information / %
19.6	52.2	21.7	6.5

Table 12: Do you agree with separate scoping for each development?

Public Participation

The idea of having public participation at the scoping stage of a development was tackled in question 5. 56.5 % of the respondents gave a favourable answer with 24.0 % disagreeing with the proposal. The results are seen in Table 13.

No / %	Yes / %	No answer / %	No available information / %
24.0	56.5	13.0	6.5

Table 13: Do you agree with public scoping?

Effects of Public Scoping

The consequences arising from the introduction of public scoping were analysed in question 6. Seven different possibilities were analysed, including one where respondents could give reasons for their answer. Table 14 shows all the results.

96.2 % of those people who agreed with public scoping indicated that this would highlight areas of concern, but 34.6 % claimed that the TOR would become more complicated.

50 % claimed that it would not have any effect on the TOR. However, this question could have confused a few, due to its wording. In fact, 30.8 % did not answer it.

65.4 % claimed that such a process would be indicative to the developer whether he should withdraw his application or not.

61.5 % claimed that this method should not create more delays.

Finally 53.8 % did not think that public scoping would produce biased TORs.

	No / %	Yes / %	No answer / %
.....produce more complicated TOR	50.0	34.6	15.4
.....highlight areas of concern	0	96.2	3.8
.....produce biased TOR	53.8	19.2	26.9
.....have no effect on TOR	50.0	19.2	30.8
.....be indicative to developer	11.5	65.4	23.1
.....be a cause for more delays	61.5	26.9	11.5

Table 14: Public scoping would..... ?

Those people who claimed that public scoping would *produce biased TOR* thought that this would be due to:

- personal interests would prevail and that only objectors' views would be heard, due to the fact that they would be more vociferous;
- people present at public meetings would not always reflect public opinion and could hold ulterior motives;
- selfishness which overrules all aspects of environmental pride;
- Not In My Back Yard syndrome (NIMBY) which would be prevalent.

People who *disagreed* that public scoping would lead to *biased TOR* gave the following reasons:

- public hearing would lead to a fair TOR and would simplify them;
- there would be an opportunity for everyone to make his/her point and sound his/her views about the development;
- the approach would be more practical and realistic than the present one;
- all issues should still be addressed in spite of the public scoping.

EIS and EPS

The second part of the questionnaire concerned the actual final reports and their contents. These refer to questions 7 to 16 of the questionnaire (appendix II).

Which types of Impacts?

In spite of the fact that the distinction between an EIS report and EPS report was clearly stated as a footnote on the questionnaire, it seems that the respondents did not realise the notable difference between the two. This is clearly shown by answers to

question 7, which investigated the areas which should be given greatest attention in the respective reports. The results in Table 15 and Table 16 showed a resounding similarity in what the respondents expected to be included in each. It seems that respondents shifted their preference slightly toward ecological and social impacts in EIS at the expense of land use, economic and health impacts, which had a slight decrease in preferences in the EIS than the EPS. Visual impacts were given an equal weighting in both reports. There was also a slight increase in *no answers* given in the EIS when compared to the EPS. One must also bear in mind the possibility that the setting of the EPS answer column prior to the EIS column, could have influenced the results.

EPS				
types of impacts	No / %	Yes / %	No answer / %	No available information / %
visual	8.7	69.6	15.2	6.5
ecological	0	73.9	19.6	6.5
social	10.9	63.0	19.6	6.5
economic	15.2	60.9	17.4	6.5
land use	2.2	73.9	17.4	6.5
health	2.2	73.9	17.4	6.5

Table 15: Which areas in an EPS should be given greatest importance?

EIS				
types of impacts	No / %	Yes / %	No answer / %	No available information / %
visual	6.5	69.6	17.4	6.5
ecological	0	76.1	17.4	6.5
social	6.5	69.6	17.4	6.5
economic	15.2	58.7	19.6	6.5
land use	6.5	71.7	15.2	6.5
health	4.3	69.6	19.6	6.5

Table 16: Which areas in an EIS should be given greatest importance ?

A question set at the end about the possibility of including any other named impacts in an EPS or EIS report resulted in a very poor response. In fact, only 17.4 % of the respondents gave an answer as regards to an EPS report whereas 19.6 % gave an

answer for an EIS report. Out of these 8.7 % claimed that other impacts should be included in an EPS whereas 13.0 % claimed that other impacts should be included in an EIS, the rest abstaining from answering.

The other impacts which were named included:

- hydrological and geological studies;
- impacts on agriculture;
- impacts on the heritage of the site;
- noise generated impacts.

One must point out that all the above impacts are already mentioned in the existing TOR issued for the quarrying industry.

Compilation of Reports

The next question (no. 8) analysed the method of compiling the reports. Three different methods were proposed for both the EIS and EPS. From the results shown in Table 17, one may note that there was a strong feeling that the reports should be coordinated by one author but with an input from various experts. Strangely enough the feeling was slightly stronger in the case of an EPS than an EIS.

Type of report	Report make-up	No / %	Yes / %	No answer / %	No available information / %
EIS	one coordinator plus experts	17.4	58.7	17.4	6.5
EPS	ditto	17.4	60.9	15.2	6.5
EIS	collated reports by different experts	26.1	30.4	37.0	6.5
EPS	ditto	32.6	21.7	39.1	6.5
EIS	one author report	47.8	2.2	43.5	6.5
EPS	ditto	45.7	8.7	39.1	6.5

Table 17: How should an EIS and EPS be compiled?

The results obtained could have been influenced by the presentation of the questions. It seems that as one went further down the question, the number of people not answering increased, to the extent that at one stage it reached 43.5 %. This, however remains only conjecture. One can only answer this possibility by rewriting the question in another exercise and compare the results.

Limited Number of Pages

The possibility of reports having a limited number of pages was investigated. The results shown in Table 18 show that there was a strong disagreement with this proposal. However, almost a quarter of the respondents thought that it would be better in the case of an EPS rather than for an EIS.

	No / %	Yes / %	No answer / %	No available information / %
EIS	65.2	17.4	10.9	6.5
EPS	56.5	23.9	13.1	6.5

Table 18: Should an EIS or EPS have a limited number of pages ?

Respondents were asked to give a reason for their answer. Half the respondents who agreed that an EIS or EPS should have a limited number of pages claimed that long reports are not attractive to read and tend to disillusion the reader. The others claimed that a fixed page report would be more precise and to the point than longer ones. It would also encourage selectivity in the content, leading to a better quality.

More than half the respondents who did not agree that page limitation should be imposed gave two principle reasons:

1. The length of the report depends much on the complexity of the issues being discussed.
2. One should be allowed to express views thoroughly and thus limitations should not be imposed.

Others also claimed that a good quality report should not have page limitations.

Quantitative vs. Qualitative Analysis

Respondents, in their majority, disagreed that both an EIS or EPS should focus more on quantitative analysis rather than qualitative aspects of the impacts generated by a development (Table 19).

	No / %	Yes / %	No answer / %	No available information / %
EIS	67.4	10.9	15.2	6.5
EPS	67.4	10.9	15.2	6.5

Table 19: Should reports focus more on quantitative aspects of the impacts rather than qualitative ones?

Alternative technology

The requirement for the inclusion of alternative technologies of extraction and production in the reports gave favourable results (Table 20). Respondents agreed that this issue should concern more an EIS report rather than an EPS. However one must also point out that more than a quarter of the respondents did not answer this question.

	No / %	Yes / %	No answer / %	No available information / %
EIS	15.2	52.2	26.1	6.5
EPS	21.7	41.3	30.4	6.5

Table 20: Do you think that alternative technologies should be tackled in an EIS or EPS?

Those who agreed that alternative technologies should be included limited themselves to stating:

- that they didn't have sufficient knowledge regarding the subject;
- that horizontal mining should be the solution because it avoids leaving large scars on the land;
- that any technology or machinery which reduces pollution and which optimizes on the resource should be used.

Alternative Sites

Quarries tend to be restricted to sites where there is the available resource. The TOR state that alternative sites should also be studied. More than half of the respondents agreed that this should be tackled in both type of reports (Table 21).

	No / %	Yes / %	No answer / %	No available information / %
EIS	13	54.3	23.9	8.7
EPS	15.2	52.2	23.9	8.7

Table 21: Do you think that the alternative sites issue should be considered in the quarry industry ?

Almost a quarter of those who answered this question did not proceed to give any reasons.

Some of the reasons given were:

- the siting of quarries depends on where the resource is found;
- quarry development depends mostly on the ownership of the land, thus restricting the choice for an alternative site;
- competent planning practice always requires consideration of options;
- conclusion from the Mineral Resource Assessment could help in finding appropriate sites;

- siting should depend on geological suitability and environmental factors;
- better methods of extraction are required.

Quality of Reports

The next two questions were mainly aimed at people who had read an EIS or EPS report and an opinion about their quality and content was elicited.

Quality	Mediocre	Very poor quality	Good quality	Relatively good quality	Very good quality	No answer	No available information
Group							
PA/DCC			4			11	2
Minerals Board			2	1	1	2	
NGOs						8	2
Local Council		1		1		10	
Authors	1						
Percentage / %	2.2	2.2	13.0	4.3	2.2	67.4	8.7

Table 22: Grade given to EPS reports by different groups.

Quality	Mediocre	Very poor quality	Good quality	Relatively good quality	Very good quality	No answer	No available information
Group							
PA/DCC			3	1		10	3
Minerals Board		1	1	2	1	1	
NGOs						8	2
Local Council		1		1		10	
Authors	1						
Percentage / %	2.2	4.3	8.7	8.7	2.2	63.0	10.9

Table 23: Grade given to EIS reports by different groups.

The results in Table 22 and Table 23 highlight the fact that over 60 % of the respondents have never read an EIS or EPS report. Secondly, members of the PA/DCC and the Minerals Board, both considered that the reports produced were mostly of good quality or above. Strikingly, the sole author thought that they were of a mediocre quality! The reason given was that the reports had a poor content and lacked philosophy.

Amongst reasons given by other respondents to justify their grading, were, that the issues were thoroughly discussed and that the lack of the requirement of such reports in the past could have influenced initial reports.

Complexity Levels of Reports

With the exception of the high percentage of respondents who did not answer a question about the complexity level of reports (Table 24 and Table 25), there was a higher percentage who think that an EPS was easier to understand than an EIS, but also that an EIS was too long to be considered fully. 8.7 % thought that an EIS was too technical. A slightly smaller amount thought likewise for an EPS.

EPS				
	No / %	Yes / %	No answer / %	No available information / %
.....too technical	8.7	6.5	73.9	10.9
.....too simple	8.7	2.2	78.3	10.9
.....easy to understand	6.5	17.4	65.2	10.9
.....beyond you in some areas	4.3	10.9	73.9	10.9
.....too long to consider fully	6.5	10.9	71.7	10.9

Table 24: Do you think that the content of an EPS is..... ?

EIS				
	No / %	Yes / %	No answer / %	No available information / %
.....too technical	6.5	8.7	73.9	10.9
.....too simple	8.7	2.2	78.3	10.9
.....easy to understand	6.5	13	69.6	10.9
.....beyond you in some areas	4.3	13	71.7	10.9
.....too long to consider fully	2.2	15.2	71.7	10.9

Table 25: Do you think that the content of an EIS is..... ?

Local Know-how

Over 50 % of the respondents think that there is sufficient knowledge locally to produce good quality reports (Table 26). There was a slight shift in response, from positive to negative replies, in the case of EIS, which it was felt should be more detailed.

	No / %	Yes / %	No answer / %	No available information / %
Type of report				
EIS	21.7	52.2	17.4	8.7
EPS	15.2	58.7	17.4	8.7

Table 26: Is there sufficient knowledge locally to produce a good quality report?

Improving the Process

Six ways were proposed to improve the EIA process (Table 27). More than 25 % of the respondents did not answer this question, whereas over 50 % disagreed that one

	No / %	Yes / %	No answer / %	No available information / %
.....monitoring impacts	2.2	63	26.1	8.7
.....increasing partners at scoping stage	8.7	50	32.6	8.7
.....doing away with EIS/EPS	56.5	4.3	30.4	8.7
.....an oral presentation	8.7	56.5	26.1	8.7
.....incorporating other technologies	15.2	45.7	30.4	8.7
.....introducing PDA	0	56.5	34.8	8.7
.....other stated methods	2.2	8.7	80.4	8.7

Table 27: One can improve the EIA process by

should do away with the reports and a very small percentage (8.7 %) indicated other ways of improving the EIA process. Most agreed with the suggested proposals to improve the process but there was an increase in the average number of respondents who disagreed that one should incorporate other technologies. The few who hinted that other ways of improving the EIA process limited themselves in stating that more educational courses should be available and that the developer should produce a leaflet for the public. Another person stated that the process could be improved by having professionals at the PA to review reports in an unbiased professional manner.

Role of the Planning Authority

A question about the role of the PA in ameliorating the EIA process was asked to the PA/DCC, Minerals Board and Authors groups. About 20 % of the eligible respondents did not answer this question, but the rest gave a wide spectrum of answers. Starting with the most common ones, these were:

- PA should improve monitoring process and issue directives where necessary;
- PA should act as a facilitator, giving objective opinions and guidance;
- PA should carry out reports itself and charge developer;
- PA should be more consistent in procedural matters and reduce its bureaucracy;
- PA will issue new regulations in the future to clearly identify the role of all participants in the process;
- PA should remove its EMU manager and leave the EIA process in the hands of EPD, provided they have the right human resources;
- PA should keep abreast of foreign developments and apply them locally;
- PA should be more proactive rather than reactive;
- PA should work more closely with EPD where necessary.

Quarries - Positive and Negative Impacts

A question addressed at NGOs, Local Councils and authors about the positive and negative impacts generated by the quarry industry resulted in a 40 % response that the industry gives a substantial contribution to the local economy, apart from the fact that the stone gives a particular characteristic to local buildings. It also provided

employment and cheap construction material. Over 25 % of the eligible respondents did not answer this part of the question.

This was reduced to 13 % where negative impacts had to be written down. One of the major impacts being attributed to the industry was that on the environment, in the forms of land erosion, damage to cliffs, generation of dust and damage to the local flora and fauna. Other impacts mentioned were those of a visual, hydrological and social nature. Local Councils were vociferous regarding the damage being done to village roads.

Consultations with Non-Governmental Organisations

NGOs were asked two other questions, one centring on consultation and the other about the future of the quarry industry. Of notable importance is the fact that out of ten respondents, only one stated that their organization had scientific information which would be required to study impacts generated by quarries. The same respondent was ready to disclose the information both freely and also at a pre-agreed fee!

Quarries.....what future ?

The results obtained relating to the future role of the quarry industry (Table 28) showed that, apart from recycling, it should start importing aggregate and stone. Quarry restoration was also high on the agenda of NGOs.

	No / %	Yes / %	No answer / %	No available information / %
...expand as a number of small quarries	40.0	10.0	40.0	10.0
...expand as few large quarries	30.0	20.0	40.0	10.0
...stop working	30.0	20.0	40.0	10.0
...import aggregate & stone	0	70.0	20.0	10.0
...start recycling stone	0	80.0	10.0	10.0
...use different technology	0	20.0	70.0	10.0
...restore quarries	0	70.0	20.0	10.0
...pay damages	30.0	30.0	30.0	10.0
...do something else	10.0	20.0	60.0	10.0

Table 28: Do you think that the quarry industry should....?

Technical questions, such as whether to use different technologies and doing something else not mentioned in the list, remained mostly unanswered, possibly due to lack of knowledge about the subject. One person stated that concrete and steel should be used as a different technology. Ideas suggested to restore quarries included:

- use as water reservoirs by channelling runoff water from roads into them;
- fill up with inert material and cover with soil and use for agricultural purposes;
- use as landfills;
- use as a tourist attraction;
- develop into theme parks;
- use as storage areas.

Those who were favourable to paying for damages done, thought that the owners should pay for restoration works or damages claimed by the Local Council and other affected persons.

A call for commissioning a scientific study on all aspects of the quarrying industry was also made by one of the respondents.

Information at Local Councils

It seems that Local Councils do not have certain information or do not want to disclose particular information about their area. Questions regarding the number of quarries with or without permits and also information about the number of resident owners or workers in the area were left unanswered in more than 50 % of cases. However, they had much more information about complaints raised by residents. No one said that the information was not available (Table 29).

	No / %	Yes / %	No answer / %	No available information / %
Complaints from residents	16.7	66.6	16.7	0

Table 29: Did you ever get complaints from the residents about quarry works ?

The results in Table 30 show that the main concerns highlighted are the emission of dust, trucks passing through the village centre and the damage from these trucks to the roads. Damage to fields and illegal activity were also reported by residents. Other complaints raised included stockpiling above street levels, traffic hazards at quarry exits and illegal change of use of quarries.

	No / %	Yes / %	No answer / %	No available information / %
noise from quarry machinery	41.6	8.4	50.0	0
trucks passing through village core	0	58.4	41.6	0
emissions of dust	0	58.4	41.6	0
excessive use of explosives	41.7	16.6	41.7	0
excessive power of explosives	41.6	8.4	50.0	0
damage to residential structures	25.0	16.6	58.4	0
damage to passing vehicles	33.3	8.3	58.4	0
damage to fields	25.0	25.0	50.0	0
damage to village roads	0	58.4	41.6	0
illegal activity	8.3	25.0	66.7	0
other complaints	0	25.0	75.0	0

Table 30: The types of complaints Local Councils have received from residents.

More Comments from Local Councils

33 % of the Local Councils gave other views not included in questionnaire, about the quarry industry. These mainly centred on the following points:

- owners should be encouraged to rehabilitate quarries. They should plant trees around the periphery;
- the use of explosives should not exceed that stipulated by the permit;
- road truck licence fees should be passed on to Local Councils to repair roads.

Approval of Experts

The sole author who answered the questionnaire stated that a lot of time is wasted to get the approval of the professionals working within one's team, from the PA. It was claimed that EMU created problems for every solution proposed.

Further Comments

All the other respondents were also given the opportunity to write down further comments they wished to include. More than half declined the offer and did not answer whereas the rests gave various answers which were grouped as follows:

- there is an urgent need to produce the Subject Plan for the quarrying industry;
- the owners are difficult people to deal with, but are slowly changing;
- specialized personnel should be on site to ensure safety working practices and other responsibilities related to the running of the area;
- there is the need to resort to mining rather than open cast quarries and rehabilitation should become compulsory;

- there is a need to know true production and wastes being generated by the industry. This could be done by the PA through a special study;
- alternative building resources have to be sought out;
- owners are governed by production and money;
- there is a need for more control on quarries and one should try and avoid risks of contamination to the water table.

4.3 Summary

This chapter was divided mainly into two areas, the first being the analysis of the existing EIA reports and the second being the analysis of the questionnaire which was sent to five different groups of people who are linked to the EIA process. The old Terms of Reference issued by the PA was converted into a matrix format for the analysis of the reports.

The questionnaire was first analysed in general terms using graphs to give a visual image of the comparisons being made. Then, the analysis focused on the different areas, mainly the Terms of Reference and the EIS and EPS reports. A number of open-ended questions provided room for respondents to air their views or give reasons for the answers provided. Supplementary questions sent to particular groups were analysed at the end of the chapter.

Chapter 5 Discussion of results

This chapter will examine the results obtained through the analysis of the reports and the questionnaire. These results are then discussed in the light of the information gathered through the interviews, identifying common areas of concern.

5.1 Analysis of EIA reports

The general evidence collected from the analysis of the reports is that half of the information requirements in the relevant TOR were ignored in three of the five reports studied. The immediate question which follows is “Why?”

- Is this due to lack of knowledge or experts in the field?
- Was this a time related matter?
- Does PA have the know-how to administer EIAs?
- Is PA adopting the right approach?

To answer these questions one has to analyse what was missing and then look at what is being asked as regards to the TORs.

Terms of Reference

Outcome from TOR

The Terms of Reference utilized in this study were the old TOR. A closer look at these TOR, shows that they provided sufficient guidelines to produce a good quality report (see appendix I). The only areas which were somewhat vague and could have been improved upon were those entitled *Major impact and mitigating measures* and *Restoration*. More detailed guidelines in these areas would have been very helpful.

The results show that, in spite of their detail, these guidelines are not yielding much. None of the one-author reports, included more than 40 % of the items required by the TORs although an improvement was registered for the multi-disciplinary team reports.

The PA has a say in the consultants writing the reports and it is evident that it was at fault in accepting a single author to write a report. However, one must accept the fact that in due course this could have been realized, because later reports were all utilizing multidisciplinary teams.

Questionable use of fixed TOR

The value of using a fixed set of TOR for the quarry industry is debatable. Wager (1993) stressed the fact that TOR “**should concentrate the EIA study on the assessment of important impacts and avoid the temptation to throw the net wide and examine all possible impacts**” (Wager, 1993, p.21). The present situation vis-à-vis the extractive industry is diagonally opposite to what had been recommended. This has led to a situation where the contents of the EIA reports have become a bargaining game between the developer or consultant and the PA. As Mallia (pers. comm., 1998) stated, in some cases, several draft reports are made before the final one is submitted. In spite of these shortcomings the PA still accepted the reports and recommended the development. The PA could have always refused the development on grounds of insufficient information. This indicates that the PA has accepted EIA reports which were not according to the respective TOR.

Recommended Improvements

The present approach being adopted should be rectified on two counts. The first being that, in spite of what is claimed in the EIA guidelines, that an EPS should be less

detailed than an EIS, this message is not being clearly conveyed by the methodology adopted. The same TORs were used for both type of developments. The perceptions of the questionnaire respondents reiterated this position.

The second fact is that, in spite of the site visits and all the elaborate preliminary work carried out by the PA (e.g. reference to its GIS etc.), some items in the TORs being issued are still irrelevant to site. This was also shown from the results obtained in the analysis of the reports. A case in point was where no trees were found on site and still the requirement for *a trees and woodland survey* was made!

A basic set of TOR could always be used as guidelines, but the authors should be presented with a site specific one which should clearly highlight the significant impacts of the development. This was also stated by Wager (1993) who said that **“the TOR should cover those matters which will be important to decisions on the project. In the end, a permit will depend on a balance between the key benefits and disbenefits of a proposal”** (Wager, 1993, p.21). The TOR utilised could also be included as an appendix in the respective report. This would help anyone who would like to review the reports.

Wager (1993) proposed that a detailed project description statement (PDS) be presented by a developer prior to issuing the TOR. The PDS would be used to decide if an EIA is required and also if in the affirmative what type of report would be necessary. To date these proposals have not yet been put into practice.

Roles of the PA and the EPD

The TOR should be produced by the Environment Protection Department, EPD, in consultation with the PA. However due to lack of human resources, in EPD, this role has been taken over by the PA and the TORs are approved by EPD (Mallia, 1998). This is a major setback to the EIA process, because the PA is basically doing the screening, scoping, and reviewing of the whole process. Thus, it cannot view the reports in an objective manner and any litigation between the developer and the PA cannot be easily resolved, because the PA could be accused of being an interested party. Wager (1993) proposed that **“there are good reasons for maintaining a separation between the organisation that is responsible to supervise, monitor and ensure quality control during the preparation of EIAs from the authority that evaluates the effects of a proposal on the basis of information contained in a planning application and an EIA study and who is responsible for granting permission to develop”** (Wager, 1993, p.7). The PA is the authorising authority, while the EPD was given the role to oversee the production of EIAs.

As an alternative to the present situation, draft reports could be reviewed by an independent body, thus possibly having a more objective view. Italy is one of the countries which has a separate body to review EIA reports (Bond, 1996).

The EPD has an important role, in building up missing baseline studies of various environmental parameters. Unless such information is available, it is very difficult to identify significant impacts. A case in point was found in water quality monitoring in fish farms (Doublet, 1997), whereby due to lack of baseline studies and a proper control site, water quality changes in the environment were not being identified.

The lack of baseline information was also confirmed through the results of the questionnaires sent to NGOs. It highlights the need to set up a national database on important local environmental parameters.

Commitment of the authors

The analysis of the reports has shown a lack of commitment from the authors to the TOR. This was evident in a number of ways, some of which are highlighted below:

- maps of a smaller scale included instead of those requested;
- lack of quantification of resource, wastes, sizes of produce etc.;
- abstaining from mentioning the appropriate methodology and techniques adopted in the analysis;
- no reference to the technical justification of resource, which is extremely important both to the developer and to the consumer;
- absence of considering alternative sites and technologies;
- not mentioning the related applications where the resource is to be used;
- avoiding the impacts and routes created by the transport related to the development;
- completely missing the section dealing with social constraints;
- mitigation measures not given a high priority in the reports.

There is no clear explanation why so many items could have gone missing from the reports. This should be considered in the framework that all these reports were being prepared by professional people, architects in all cases, and at substantial costs ranging between LM5,000 to LM10,000¹⁰ for the developer (Aquilina, pers. comm.,

¹⁰ LM1.00 is equivalent to £1.5446 (Mid-Med Bank exchange rate on 13/2/98).

1998). The representative of the quarry owners said that EIAs are a financial burden on the industry. Why is the PA allowing all this to happen and finally endorsing it by approving the development?

TOR and Public Perceptions

Knowledge of the EIA process

The results obtained from the questionnaire revealed that the respondents are not sure what an EIA process is and what it should entail. In spite of the fact that over 50% of the respondents never read the TOR of the quarry industry, they still thought that the approach adopted was correct. The reasons given were various, including those that *similar developments have similar problems and the system avoids discrimination*. The TOR should be used so that the reports can study the effects of the significant impacts which would have already been identified through the scoping phase. This was even stated in the Wager report (1993). These should be tailor-made for each development and should be the result of a separate scoping procedure for each development. The majority of respondents agreed that each application should be scoped separately.

Public Scoping

Public scoping does not form part of the present procedure. The majority of the respondents agreed with public scoping, many stating that it would highlight areas of concern. This contradicts the same respondents who had already claimed that they agreed with the present approach adopted by the PA. Many thought that public scoping would take the form of a public hearing. This was shown from the responses obtained to the *reasons for the possibility of a biased report*. The view that *personal*

interests would prevail and that *the public would not be truly representative* were also aired.

No one mentioned the possibility of using questionnaires or surveys in public scoping or utilizing the resources at Local Councils or NGOs. The questionnaire results have, however, shown that they do not seem to have much information available.

Concerns of Local Councils

From the results obtained from the supplementary questions sent to Local Councils, it has emerged that there are three main areas of concern which were ignored in all the reports, but which were considered important by local people. These were:

1. public nuisance caused by trucks passing through village centres;
2. damage to roads by construction trucks;
3. emission of dust from quarry sites.

Quarries tend to start work as early as 02.00 hr., especially during the hot summer months. This mostly concerns soft stone quarries which are south facing. This is due to the extreme temperatures which build up during the day which makes it humanly impossible to work there. Most of the people connected with the construction industry live in villages, hence the use of trucks passing through the village centres during the hot months is seen in an unfavourable light.

Secondly, the tonnage of road trucks has increased from 3 tons to 38 tons over the last 25 years (Aquilina, pers. comm., 1998). Some respondents stated that the local roads

were not built to cater for such heavy vehicles and were subsiding due to the flow of the heavy vehicles.

These are some of the effects which should be addressed under *transport impacts* in the EIA reports.

Dust emissions are mainly linked to the siting of the stockpiles in the quarry and also to that of the crusher. Both could be solved by better quarry management techniques and also in some cases by washing the aggregate. This is mostly limited to hardstone quarries (Wardell Armstrong, 1991b). There are no baseline measurements of dust next to these quarries, but the dispersion effect of powder fines can be seen from quite a distance, especially during the summer months or on windy days (Photo 4).

In the case of soft stone, up to a few years ago, stone dressing took place at the construction site. Nowadays, the use of stone has become limited to the facades of buildings and so less is used. Secondly, stone dressing is taking place prior to loading on trucks in the quarry, so less dust is generated on site (Photo 5).

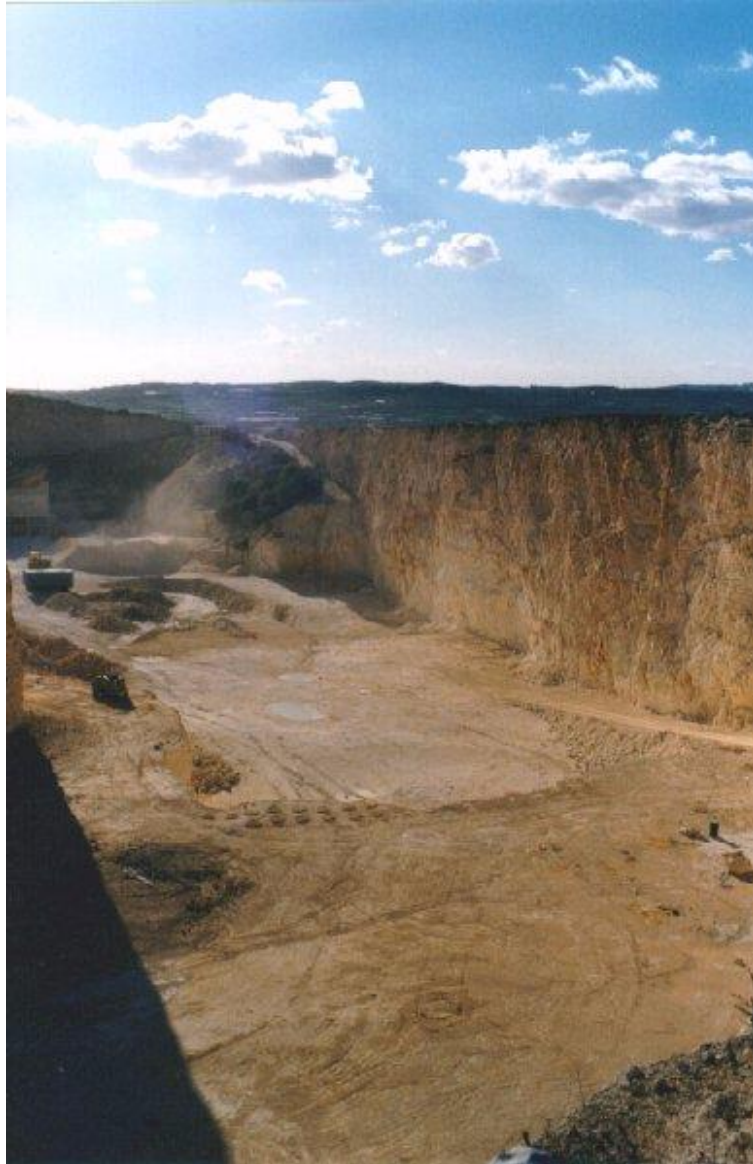


Photo 4: Dust emanating from aggregate heap inside a hardstone quarry.

The introduction of ready mix concrete and pre-stressed concrete planks has also reduced much of the inconvenience which used to be created in the streets, when truckloads of aggregate were dumped on the days preceding the roofing stage of a building.

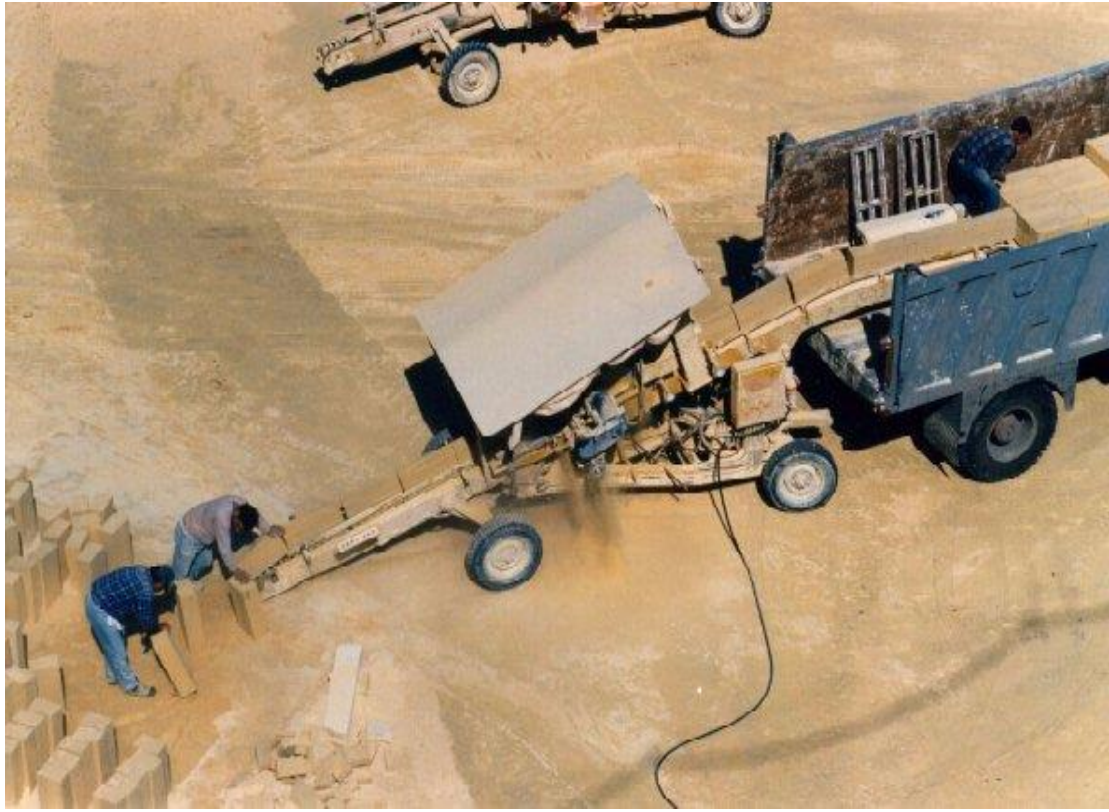


Photo 5: Workmen using a stone dressing machine prior to loading softstone on a truck.

Difference between EIS and EPS

The questionnaire has also shown the lack of distinction between the EIS and EPS reports and their contents. This was shown mainly from the results obtained for the impact of greatest importance which should be studied in the EIS and EPS reports.

Ecological, social and health impacts had top priorities in both type of reports whereas the economic impacts were given the lowest rating. Ecological impacts were always high on the priority list of respondents. This contrasts well with the actual contents of the reports whereby ecological *desk and field studies* were only carried out in 40 % of the cases and appropriate mitigation measures adopted with the same percentage.

One must also note the frequent absence in the EIA reports of the economic impacts. This tallied well with the questionnaire results where the importance of economic impacts was given the lowest rating.

Format of Reports

Two different report formats were found to be adopted, one was that of a single author writing down a report and the other of a multidisciplinary team format. The latter format, although, of a higher standard and in accordance with registered public perceptions, had one major drawback in most of the studies. The report was made up of a sequence of non-interrelated studies, so there was a lot of repetition between them. This could have been avoided had the coordinator decided to write down a coordinated report and present it as the actual EIS or EPS. Then under separate cover or as part of the report itself, the original reports would be presented as an appendix. This method has the advantage that the report is:

- shorter and therefore more legible and manageable;
- simplified, but with all the details for the more technically minded to consult;
- informative, by highlighting the significant impacts studied.

This method must also be viewed within the framework that a substantial high percentage of the respondents who answered the question dealing with the content of the reports thought that they were too technical to be considered fully. A smaller proportion who thought that some areas were beyond them. One must consider these results within the setting that most of these respondents were at a decision making level. The same group of respondents also stated that the reports being produced

varied between good and very good quality. This could mean that these people were impressed by the content which was beyond their perception and hence the grading given! One must also consider this grading when in most cases the TOR were hardly followed!

Quantified vs. Qualified Impacts

There was little support from the respondents that impacts should be quantified rather than qualified. Quantification of impacts is more scientific and gives a clear idea of the size and nature of impacts being studied. The absence of this concept by most respondents continues to highlight the lack of knowledge regarding the subject.

Alternative Technology

The issue of alternative technologies should be given great importance in the extractive industry. This is due to the fact that this industry is leaving large scars in the land, which in some cases have a high visual impact (photo 5.3) . This is mainly attributed to hardstone quarries (Wardell Armstrong, 1991c). The few respondents who answered the relative question, gave basically two main answers which should be studied. The first is that of mining and the other is that of using a cleaner technology which optimizes on resources. Duca, (pers. comm.,1998) claimed that mining is possible for both type of quarries, but there is no mining legislation in Malta. The few tunnels which have been dug so far did not have any legal backing but most have used routes passing under government roads. Mining and the introduction of cleaner technology were issues which Aquilina (pers. comm., 1998) said would cause financial problems and as a result the product would be much more expensive. This would put mining companies at a disadvantage to the ones who have the old type of quarries and technologies. This shows there is an urgent need to study this issue and

derive the economic, ecological and other benefits which can be quantified from the introduction of new technologies.



Photo 6: Scars in the landscape left by a hardstone quarry.

One must also point out that by means of mining one could access the quality type of stone with less wastage, because one is moving in a horizontal manner, that is, parallel to the layering found in the Islands' geology (Duca, pers. comm., 1998).

Alternative Sites

The alternatives sites issue has been included in the new TOR. The public perception was that this is a difficult issue for the extractive industry because the land used is usually connected both to ownership and resource. Both issues could be overcome if mining becomes possible. The ownership of land at different depths would obviously have to be well defined by legislation to clear up any problems with owners of the land above the mining site. The Mineral Resource Assessment could also be very useful to identify appropriate sites.

Future of the Quarry Industry

The future of the quarry industry is directly linked to EIAs. This is due to the fact that if EIAs address the following issues:

- i. the recycling of stone to produce certain type of aggregate;
- ii. the importation of aggregate instead of that produced locally;
- iii. the mining of aggregate or stone,

and the results would show that the impacts would be less, then the industry will have to change. The questionnaire results have been highly favourable to the above three possibilities. However, Aquilina (pers. comm., 1998) stated that importing and mining are not feasible. He said that the price of aggregate would go from LM 3.20 /m³ to approximately LM 90 /m³, if this were imported from nearby countries, such as Libya or Sicily. This would render importers uncompetitive with local producers. He said that there were no price increases in the product over the last 18 years and the industry had to absorb wage, fuel and other increases. He continued that the construction part of any building is the cheapest part because the stone is very cheap. He also said that quarry owners undermine one another by offering cheaper priced products.

Recycling has started lately and quarry owners are offering cheaper prices than the Government for the dumping of stone in their quarries rather than the local Government tip. This is having undesired consequences, because the household and industrial rubbish is emanating bad smells and some is burning, due to the unavailability of construction waste used to bury the organic and flammable material (Xuereb, 1998). Some quarry owners are crushing the stone into aggregate while others are using it to fill void parts of the quarries.

Restoration

Restoration schemes have been regrettably omitted from the new TOR. In the old TOR, they were limited to converting quarries into orchards. The message was channelled in the TOR itself which asked for a 15 year planting and growing scheme. The results from the questionnaire showed that a number of other possibilities exist, apart from conversion into gardens. Theme parks and storage areas are two which could easily be considered. In most cases where warehouses are constructed, a lot of excavation takes place. Disused quarries can be easily used for such purposes.

It is important that one outlines the restoration use of a site prior to excavating that site. This is due to the fact that after-use could be linked to the management of the site during operation. Secondly, restoration could start during the operational phase and not after this phase is over. This is obviously limited to large quarries, which are not very common.

5.2 Summary

This chapter tried to answer a number of questions set at its beginning, to find a reason why the EIA reports had so many items included in the TOR, missing. It showed that PA has shown improvement in some areas which were addressed in the new TOR, but missed others. It has shown that the problems to be addressed go beyond the remit of the PA.

Chapter 6 Conclusions

This chapter will first check whether the methodology adopted has answered the question set in the introduction of this dissertation, that is, whether the scoping process in EIAs for the extractive industry is being carried out in an appropriate manner and the significant impacts are being identified. It will proceed to highlight the areas of concern which were identified and finally recommend solutions which would help to ameliorate the whole process.

6.1 Was the Scoping Process carried out in an appropriate manner?

The outcome of this dissertation has identified that scoping is not being carried out appropriately. The approach being adopted presently in the extractive industry was not recommended by the Wager report which was commissioned for the Planning Services Division. The study has shown that some issues which were considered important by the questionnaire respondents were not being considered. Again, one must stress the fact that some of the reports were the final result after an unknown number of draft reports being reviewed by the PA staff. This situation could be rectified, by adopting the following approach:

1. Site specific TOR should be issued. These should only study the significant impacts of the project.
2. Draft reports should only be reviewed once by the PA staff.
3. Comments on final report and recommendations made by the PA prior to decision should also include the possibility of refusal for lack of adherence to

the stipulated TOR, previously issued. This should be clearly made to the developer and consultants at outset.

4. PA should adopt a professional approach to the whole EIA process and avoid entering into bargaining exercises with customers.

Education

The study has also shown the lack of knowledge at all levels (decision making, advisory, consultancy, NGOs and Local Councils) regarding:

1. the importance of the EIA process;
2. knowledge of the whole process and the importance of its iterative mechanism;
3. perception of significant impacts;
4. management of the EIA process at the PA.

There is a need for the EIA process to be handled in a more professional manner. This was also reiterated in the questionnaire results. This could be done through short courses aimed at different levels of the public, but priority should be given to the PA staff, consultants, developers. This would show them the importance of all the stages in the whole process. The aim would also be to disseminate information and as a result change the attitude towards the EIA process. Local, as well as foreign consultants, could be engaged to coordinate such courses. Persons appointed on decision making boards of the Authority should also be briefed about important aspects of the planning process, such as EIAs. This would put them in a better position to understand recommendations for a decision made by the PA staff.

Baseline Information

The study has also shown that there is lack of baseline information. This is very important to identify the significant impacts of a project. This is a role which should be shouldered by the Environment Protection Department, EPD, so that it could establish a database for the local natural environment. The University of Malta could also collaborate in such a project by utilizing science students through field work and dissertations.

Expertise

The EIS and EPS reports have shown that there is lack of expertise in some areas, amongst which were the economic impacts and also noise. One must first know the exact reason why economic impacts were nearly always ignored. There is the possibility of lack of information forthcoming from the developer but there is also the second possibility which is that of lack of knowledge from experts in the economic field. Whereas in the former case, it is the developer who will have to face the consequences of his actions, in the second case, one might be able to offer short courses to those interested in the subject. A similar approach could be adopted for noise impacts. One could also study the feasibility of getting foreign consultants to do the job.

Statistical Data

The initial part of the study showed that the questionnaire method presently adopted by the Central Office of Statistics to collect production and sales information from the quarry industry is not giving correct results. These results are of prime importance especially when one considers the information collected from the Mineral Resource

Assessment. The PA is in a position to rectify the situation by routine monitoring of the quarry sizes. It could also collect information from all planning applications of the approximate quantities of different materials which will be used in the developments and thus, it would have a more accurate view of where the mineral resource balance stands. Thus, the PA could act accordingly, even in giving planning applications to large developments which consume large amounts of mineral resource. One could consider taxing such developments, thus safeguarding mineral overuse. It would be a system of planning gain, the benefits of which will be reaped in eighty to one hundred years' time.

Alternative Sites and Technologies

The study showed the need to address the alternative sites and technology issue. This should be viewed at different levels namely:

- legislative;
- quarry industry;
- Planning Authority.

The introduction of mining legislation in Malta will open up the possibility of changing extractive technologies. Secondly, it will clarify any doubt about land ownership within a mining area. Thirdly, mines could have a smaller visual impact and should produce less environmental damage. This would be possible because, with the exception of the opening and processing area, the surface of the land would remain intact. One could also consider digging up mines from existing quarries, thus avoiding new openings. Unused parts of the quarry could be restored and embellished accordingly, possibly reducing some of the visual impacts.

Aquilina (pers. comm., 1998) said that the quarry industry is not considered as an industry by the Malta Development Corporation (MDC) and so is not eligible to subsidy funds for restructuring. This has resulted in little modernization in the industry throughout the years. Apart from this, the prices of the product have not changed much and also owners tend to undermine each others efforts when anyone tries to increase the prices. This problem could be analysed through a Government commissioned study.

The aims of the study should be:

1. The restructuring of the industry to meet present standards using modern technology with special reference to care of the environment. This will probably lead to an increase in the price of the product provided it will be still be feasible to extract locally and not import foreign rock which is much stronger.
2. The possibility of pooling resources between quarry owners who are family concerns and so have limited financial resources.
3. The possibility of diversification of products by the same owners (e.g. recycling of old stone etc.).

The Planning Authority should start working on the Minerals Subject Plan which should address the extractive industry holistically. This view was also stated by two questionnaire respondents. The TOR of the Plan have not been published and so it is as yet unknown whether the Plan will be considered within the present traditional working practices or whether it would be within the framework for the possible modernisation of the industry and introduction of new technologies.

Restructuring the EMU

The Planning Authority needs to restructure the Environment Management Unit, which is the team of people who are responsible for the EPS and EIS. The present system whereby there is the possibility of a Transport Impact Statement, TIS, done by a different section of the Authority has to be modified. A Transport Impact Assessment is part of an EIA and should be treated likewise. Transport impacts cannot be limited to road design and flow rate of cars. Transport generates other impacts namely, noise, air quality and road impacts. Respondents from Local Councils stated that the construction vehicles were damaging local roads and are a cause of public nuisance in village centres. Such an impact was not appropriately addressed in the EIA reports studied.

Role Players in EIA

The restructuring must be followed by a clear definition of roles in the EIA process whether those of the PA, the EPD, developers and consultants. This was also stated in the Wager report (1993).

The EPD should be given the role of:

- Issuing TOR to study the significant impacts of the development. The PA should still have an input as regards to planning policies and consultation with EPD. Restoration schemes should also form part of the EIA report.
- Establishing a baseline Database for the local environment. This is important to identify the significant impacts.
- Keeping a register of qualified consultants and EIA coordinators in the respective fields.

- Reviewing the draft reports from a technical point of view.
- Monitoring environmental impacts on a regular basis. Monitoring should help in the introduction of Post Development Audit and also as feedback for future EIAs.

The role of the PA should be limited to:

- Screening the development applications and deciding what type of reports should be prepared. Their decision should be clearly stated in writing and backed up by reasons.
- Reviewing the quality of the draft reports prepared using standard methods, such as the Lee and Colley method.
- PA should introduce the necessary regulations for Post Development Audits of projects which have been subject to an EIA report.

Developers should ensure that the coordinators they engage are duly qualified to do the job properly. The co-ordinators could then be responsible for engaging the right experts for the job. They should be responsible for the final coordinated report and its presentation.

6.2 General Summary of Conclusions

The study has identified:

- the lack of knowledge and appreciation of the EIA process at all levels under investigation;
- the lack of baseline studies and information necessary to identify significant impacts;

- that the PA accepted EIA reports which had several items required in the TOR missing;
- that the quarry industry is reluctant to change under the present circumstances.

To overcome these problems, the study recommends:

- The restructuring of:
 - i. the quarry industry, after an appropriate study to identify bottleneck areas for its modernization and duly propose appropriate solutions;
 - ii. the Environment Management Unit within the Planning Authority, to include all aspects of assessment, including that of transport, under its umbrella;
 - iii. the Environment Protection Department, EPD, to act as a complementary part in the technical nature of the EIA process.
- Introduction of short courses on the EIA process, aimed at different levels. The aim would be to change the present attitude of the key participants in the process and make them aware of its importance.

One hopes that if these recommendations are accepted, the key players in the EIA process would be in a better position to understand its importance and implications. This could also lead to a better scoping process and the eventual production of reports of a better quality.

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Persons Contacted

- Mr. Adrian Mallia, Environment Management Unit Manager at the Planning Authority, January 1998.
- Mr. Dimitrio Duca, Team Manager of the Minerals and Waste Planning Team within the Environment Management Unit at the Planning Authority, January 1998.
- Mr Leli Aquilina, President of the Quarrying and Construction Action Committee within the General Retailers and Traders Union, February 1998.
- Mr Kevin Mercieca, member of the Minerals and Waste Planning Team within the Environment Management Unit at the Planning Authority, December 1998.

APPENDIX I

Terms of Reference

Environmental Impact Assessment

Hardstone Quarry

1.0 **Aim**

The aim of the Environmental Impact Assessment is to evaluate the impact of the proposed operations on the intrinsic value of the site. It should cover the following aspects:-

1. Location of the site and description of intended development
2. The current and projected need of the resource (aggregate)
3. Technical justification of resources
4. Major impacts of the quarry and mitigating measures
5. Quarry restoration

These short notes should be read in conjunction with the Code of Practice for Quarry Working and Restoration and Policy Min 8 of the Structure Plan.

2.0 **Present Location**

2.1 Site Location: Description: to include present land and resource use, legal status, extent of ownership, description of features on site and indication on 1:500 site plan.

2.2 Geology: to identify the geological formation intended to be worked, its quality and quantity based on published geological maps and other literature, published and unpublished. Reference should be made to existing dissertations related to local aggregate and which are available through local and foreign sources. Other problems related to the geology of the area such as hydrology should also be studied.

2.3 Ecology: to carry out desk and field study to identify plant and wild life present and / or likely to be present in the locality. The likely effects of upsetting the ecosystem of the area and ways of mitigating impacts should be stated.

2.4 Existing Trees and Woodland: to include a 1:250 site plan with full tree/woodland survey. Trees are to be shown by species and in the case of single trees indicate their diameter at 130cm height from ground level. Trees which are less than 1.50m high are to be included and the presence of natural regeneration is to be especially marked, showing clearly the present extent of the area.

2.5 Archaeology: to outline the location, proximity and stability of any buildings or structures of historical and/or archaeological interest in view of assessing the likely impact of vibration generated by the workings. The area considered should be within a distance of say 500m from all points on perimeter of quarry or at such a maximum distance within which impact is envisaged. Such impact may include vibrations deriving from a specific method of extraction employed, transport movement, heavy vehicles, fixed quarry plant, etc. as well as dust emissions resulting from various stages of the operation.

2.6 Landscape and Visual Assessment: to assess the area including the degree of visual intrusion and its potential impact on areas of natural and / or man-made beauty and producing photomontages taken from at least three points to be agreed with Planning Directorate.

2.7 Social Constraints: A social cost benefit analysis shall be undertaken and shall include a comparison of social benefits emanating from the extraction of resource including employment and incomes generated with the social costs emanating from amongst others as a consequence of environmental, cultural, ecological and landscape damage.

2.8 Other Planning Constraints: to include rock material transport routes, soil and soil handling techniques, plant allocation, storage of aggregate, etc.

3.0 Need of Resource

3.1 Need for the resource: to include associated current and projected end users and related applications. Expand on the competitive advantage of quarried rock from the site under consideration as compared to that produced from other sources and include any references to traditional use of adjacent areas for the production of good quality aggregate.

3.2 Choice of extraction method as against alternatives: to include details of the method considered most suitable in conjunction with the type of rock to be quarried and envisaged impacts on the area of influence of the quarry site. Explain advantages of choice of method over alternative extraction methods. Submit also cost benefit analysis of preferred quarrying method as compared to alternative methods and justification of choice.

3.3 Intended use of aggregate: to include a list of the envisaged sizes of aggregate and quantities of each size that will be produced. Areas of consumption of the produce need to be identified. A cost benefit analysis of envisaged income as against impacts should also be included.

3.4 Extent of quarry waste: to be quantified. Intended method of controlled disposal of inert solid waste and other generated waste should be clearly explained providing such details as location of disposal and method of transport.

4.0 Technical Justification of Resources

In order to assess the quality and amount of reserves, an empirical assessment of the quality of the deposit intended for extraction under this application needs to be included. The range of samples to be tested ought to cover the whole strata intended for extraction. Minimum number of test samples required is eight (8). Data required included relative density, water absorption, aggregate impact value, and aggregate crushing value. All tests are to be executed according to B.S. 812.

The sampling points should be marked and the markers need to be visible in a photo taken such as to serve as a visual record of the strata sampled. The Minerals Planning Unit reserves the right to demand further testing and /or to redo any part of the testing programme submitted with the report at the applicant's cost.

Both sampling and testing should be carried out by a competent independent civil engineering body that has received prior approval by Minerals Planning (EMU). A copy of the results is to be forwarded to this unit by the analytical laboratory.

5.0 Major impacts and mitigating measures.

5.1 *Environmental*: Noise and dust pollution and control both from plant and traffic generated by the works, vibration generated by the works, etc.

5.2 *Cultural and visual*: archaeological, historical, access to adjacent areas and especially scenic and historic sites.

5.3 *Ecology*: local fauna and flora species, access to sites of ecological importance.

5.4 *Landscape*: assess site intrinsic features giving rise to characteristic scenic views and produce ways of mitigating present and envisaged impacts.

6.0 Restoration

6.1 *Envisaged site re-use*: to submit a programme for the restoration of worked out quarry sites, starting at an early stage of the quarry life. Identify applications of a suitable restoration scheme and assess the environmental and socio-economic value of such a scheme on the immediate quarry surroundings.

6.2 *Tree cover*: a programme of tree planting is to be provided and should include provisions for securing healthy growth up to a period of fifteen years after planting.

Details with respect to planting locations,, tee types / species and overall management of scheme should also be included.

For planning Directorate

APPENDIX II

Pages 109 - 114: questions sent to all groups (no.1-16)

Pages 116 - 117: supplementary questions sent to NGOs;

Pages 118 - 119: supplementary questions sent to Local Councils;

Pages 120 - 121: supplementary questions sent to authors;

QUESTIONNAIRE

The questionnaire is solely about Environmental Planning Statements, EPSs, and Environmental Impact Statements, EISs, concerning extensions of existing quarries and permission for new quarries ONLY and so it would be appreciated if the answers given will focus only on such issues.

Scoping⁸ and Terms of Reference

The Planning Authority issues Terms of Reference which are used as guidance for the production of Environmental Impact Statements, EIS and for Environmental Planning Statements, EPS for the quarry industry. The decision taken whether an EIS or EPS is required is taken by PA staff using the *Environmental Impact Assessment in Malta Policy and Design guidance* booklet.

1. Have you ever read the Terms of Reference, TOR used in the quarry industry?

Yes No

(please tick as appropriate)

2. The Planning Authority, PA, has issued a standard Terms of Reference, TOR, for the production of EISs or EPSs. Do you agree with such an approach ?

Yes No.....

2.1. Give reasons for your answer.

.....
.....

3. Do you think that the TOR for the quarry industry are:

- sufficient to produce good quality report Yes No
- too detailed to produce a good quality report Yes No
- impossible to be met by any developer Yes No
- do not provide sufficient guidance to produce a good quality report
Yes No
- I cannot answer this question because I have never read the TOR mentioned above Yes No

⁸ Scoping is the term used to define key issues which need to be addressed in an EIS or EPS.

4. Would you agree if each individual application for a quarry project would be subject to a separate scoping exercise leading to a separate TOR for each application ? **Yes No**

5. Do you agree that the TOR should be issued after a public hearing (public scoping meeting) where various interested organizations and local residents could express their views about the development ? **Yes No**

6. Do you think that when scoping a project in such a manner (as stated in number 5), the TOR will :-

- become more complicated **Yes No**
- highlight areas of concern **Yes No**
- be biased (give reasons for your answer) **Yes No**
-
- not have any effect on report (EIS/EPS) **Yes No**
- be indicative to the proposers whether to withdraw application or not **Yes No**
- create more unnecessary delays in the process **Yes No**

EIS and EPS⁹

7. Which areas in an EIS and EPS should be given attention:

	EPS	EIS
• visual impacts	Yes No	Yes No
• ecological impacts	Yes No	Yes No
• social impacts	Yes No	Yes No
• economic impacts	Yes No	Yes No
• land use	Yes No	Yes No
• health impacts	Yes No	Yes No
• others (please name)	Yes No	Yes No
.....		
.....		
.....		

8. Do you think that an EIS and EPS should be :-

- compiled & coordinated by one author with various contributions from various experts

EIS	Yes No
EPS	Yes No

- made up of a number of collated reports by different experts

EIS	Yes No
EPS	Yes No

- written by one person using his available knowledge & techniques

EIS	Yes No
EPS	Yes No

⁹ The difference between an EIS and an EPS is that the EIS is a more comprehensive report than an EPS, the latter covering less topics than the former. A project accompanied by an EIS requires a public hearing whereas an EPS doesn't.

9. Do you think that an EIS and EPS should have a limited number of pages ? Give reasons for your answer

EIS Yes No

EPS Yes No

.....
.....

10. Do you think that both EPSs and EISs should focus more on quantitative analysis rather than qualitative aspects of the impacts generated by the developments ?

EIS Yes No

EPS Yes No

11. Alternative technologies (of extraction and production) are mentioned as a requirement in the latest TOR issued by the PA for the quarry industry. Do you think that such an issue could actually be tackled in an EPS or EIS ?

EIS Yes No

EPS Yes No

11.1. In case of a positive reply, please state what type/s of alternative technologies could be considered in an EIS and EPS for a quarry, giving reasons for your answer.

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.....

12. Alternative sites for the development of a new quarry are rarely, if ever, considered in an EIS or EPS for a quarry. Do you think that this issue could be considered in the quarry industry ?

Give reasons for your answer.

EIS Yes No

EPS Yes No

.....

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.....

13¹⁰. As a member of a decision making body, how would you grade the EISs and EPSs in the quarry industry which you have read. (Tick where appropriate).

	EIS	EPS
Mediocre
Very poor quality
Good quality
Relatively Good quality
Very good quality
Give reasons for your answer.

14³. Do you think that the content presented in the reports is:

	EPS	EIS
• too technical for you	Yes No	Yes No
• too simple for you	Yes No	Yes No
• easy to understand	Yes No	Yes No
• beyond your knowledge in some areas	Yes No	Yes No
• too long to be considered fully	Yes No	Yes No

¹⁰ This question should only be answered by those respondents who have read an EIS or EPS for a quarry permit and form part or have formed part of a decision making board of the PA.

15. Do you think that there is sufficient knowledge locally to produce good quality

EISs and EPSs ?

EIS

Yes No

EPS

Yes No

16. State which of the following ways would you suggest to improve the standard of the EIA process.

- Monitoring impacts of past applications **Yes No**
- Increasing the number of partners in the scoping stage of the process
Yes No
- doing away with the reports **Yes No**
- making a brief oral presentation prior to a decision
Yes No
- incorporating other technologies (e.g. multimedia)
Yes No
- introducing post development audit **Yes No**
- others (state) **Yes No**

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17. What should be the role of the Planning Authority to ameliorate the EIA process ?

.....(also sent to authors).....
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18. Please write down any other comments you would like to make re the quarry industry.

.....(Also sent to authors and NGOs).....
.....
.....
.....
.....
.....

Thank you for filling in this questionnaire and helping me with my studies.

Joe A Doublet

&&&&&&&&&&&

Name:.....

Contact phone number.....

Could you please state the name of the Board or Committee of the Planning Authority were you have served:

Are you still a member of this Board / Committee ? **Yes** **No**

For how long have you formed part of this Board / Committee.....

Could you please write down your full time occupation ?.....

Have you got any relative working in the quarry industry ? **Yes** **No**

Have you ever been to any quarry in Malta and Gozo ? **Yes** **No.....**

In case of a positive reply please state if it was a hard stone or soft stone quarry.

(A slightly modified version was also included with the questionnaires of the other groups)

CONSULTATION

17. If a consulting firm or the PA approaches your organization re a quarry application, have you got the required scientific information which would be required to study the impacts generated by a new quarry on the surrounding environment ? **Yes** **No**

17.1 Would you be:

- ready to disclose such information freely ? **Yes** **No**
- ready to disclose such information at a pre-agreed fee ?
Yes **No**
- unable to disclose any information at all ? **Yes** **No**

18. List down any positive and negative impacts, if any, you think the quarry industry generates in Malta.

Positive Impacts.....(*also sent to Local Councils and authors*)

.....
.....
.....

Negative Impacts.....

.....
.....
.....

19. Do you think that the quarry industry should:

- continue to expand as a number of small quarries ?
Yes **No**
- expand into a few very large quarries ? **Yes** **No**
- stop working all together ? **Yes** **No**
- start importing aggregate & stone from elsewhere ?
Yes **No**
- start recycling stone ? **Yes** **No**

- use a different technology ? (state what type) **Yes** **No**

.....
.....

- start restoring quarries ? (state how ?) **Yes** **No**

.....
.....

- pay for damages you think it has done ? (state how and to whom ?)

Yes **No**

.....
.....

- do something else ? (State what and how ?) **Yes** **No**

.....
.....

LOCAL VIEWS

17. State the:

- Number of quarries which have been exhausted in your area
.....
- Number of quarries which have been converted to other uses in your area:
 - use.....number.....
 - use.....number.....
 - use.....number.....
 - use.....number.....
- Number of quarries which **have a PA/PAPB permit**.....
- Number of quarries **without a PA/PAPB permit**.....

18. State the approximate number of residents in your area who are owners of a quarry and the number of residents who work in quarries found in your locality.

Resident owners

Resident workers

19. Did you ever get any complaints from residents about the quarry works ?

yesno.....

19.1. Were the complaints about :

- noise arising from machinery within quarry **yesno.....**
- trucks passing through village core **yesno.....**
- emissions of dust **yesno.....**
- excessive use of explosives **yesno.....**

- excessive power in explosives used **yesno.....**
- damages to residential structures **yesno.....**
- damages to passing vehicles **yesno.....**
- damages to fields **yesno.....**
- damages to village roads/streets **yesno.....**
- illegal activity **yesno.....**

others (state).....

20. State any other views of the Council might have about the quarry industry in your locality. (Please list even divergent views)

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.....

AUTHORS

17. How long have you been involved in coordinating or compiling EPSs or EISs ?

.....

18. What is the average time taken to compile an EPS and an EIS (starting from when the developer contacts you till the presentation of the final report) ?

EPS

EIS

19. List the areas, stating reasons, where you feel a lot of time is wasted in compiling an EPS and an EIS ?

EPS.....

.....

EIS.....

.....

20. Write down your suggestions how one could avoid such wastage of time.

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.....

21. List down the difficulties, if any, encountered with each of the following when compiling an EIS and EPS. In each case suggest how one could overcome such difficulties:-

- with developer

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- with PA

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- with experts commissioned

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- with others (state with whom)

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APPENDIX III

60, Manuel Dimech Street,
Sliema SLM 02

Dear Mr,

I am presently reading my MSc in Environmental Impact Assessments, EIAs, with the University of Wales, Aberystwyth and am collating information for my thesis, the title of which is “The scoping process in the extractive industry in Malta, a case study for soft stone and hard stone quarries”. The aim of this study is to verify if the scoping process, that is, the procedure to identify the key impacts in the quarry industry, could be improved. To achieve this aim, I have designed the enclosed questionnaire which is being sent to members of the Planning Consultative Committee. The opinion of members who sat or are still sitting on other Planning Authority boards and authors of Environmental Impact Assessments and Planning Statements and a number of Local Councils is also being sought.

All the information collated from the questionnaire will be used solely for the purpose of my study and only by myself. No direct reference will be made to any person answering the questionnaire.

Please do not hesitate to refrain from answering any question, especially where you think that you do not have the required information or knowledge.

I would be very grateful if you would be able to send back the questionnaire in the self addressed enclosed envelope by **Friday the 23rd January 1998**.

In case you require any further information, please do not hesitate to contact me on 313656 (after 15.00hrs).

Thanking you for your attention.

Yours sincerely

Joe A Doublet

APPENDIX IV

60, Manuel Dimech Street,
Sliema SLM 02

Dear

Reference is made to the questionnaire I sent on the 11th instant.

I am writing this letter to inform you that to date, I have not yet received any reply from you. I understand that you are a busy person and that you might have limited time to spare, to fill it in. However, it would be greatly appreciated if you could send in the filled questionnaire.

If you feel that you do not have sufficient knowledge to answer the questions, this is a valid reason why you should fill the parts you can and send it back stating the reasons for failing to answer the other questions. This is important for my study.

In case that you would not like to answer any of the questions or feel that you do not have sufficient time to fill it up, I would be grateful if you would send it back, including a short note for abstaining from answering it.

In the event that you have misplaced the questionnaire, please contact me on 313656 (after 15.00hrs) and I will send you another copy.

Your collaboration would be greatly appreciated if you would be able to send back your copy by **Friday the 30th January 1998**.

Whilst thanking you for your attention, I look forward to your replies.

Yours sincerely

Joe A Doublet

APPENDIX V

Key 1- yes
0 - no
N/A not available information

Report number	1	2	3	4	5
EPS/EIS	EPS	EPS	EPS	EPS	EIS
Date of report	Mar-96	Nov-95	Feb-96	Dec-96	Feb-97
Hard stone/soft stone quarry	SS	SS	SS	HS	HS
2.0 Present Location					
2.1 Site description					
· present land use	1	1	1	1	1
· legal status	0	0	0	1	1
· ownership	0	0	0	1	1
· features on site	1	0	1	1	1
· 1:500 site plan	1	0	0	1	0
2.2 Geology					
· formation	0	0	1	1	1
· quality	0	1	1	1	1
· quantity to be worked	0	0	0	1	1
· hydrology related problems	0	1	0	1	1
2.3 Ecology					
· Desk & field studies					
flora ID	0	0	0	1	1
fauna ID	0	0	0	1	1
· effects on flora & fauna	1	1	0	1	1
· mitigation measures	0	0	0	1	1
2.4 Existing trees & woodland					
· 1:250 site plan (tree/wood survey)	N/A	N/A	N/A	1	1
· species shown (trees >1.5m h [incl. diameter])				1	N/A
· natural regeneration (trees <1.5 m)				1	N/A
2.5 Archaeology (500m diameter range)					
· location (historical/archaeological buildings)	N/A	0	N/A	1	1
· siting vis-à-vis project		0		1	1
· stability		0		N/A	1
· impacts generated from project		0		1	1
2.6 Landscape & Visual Assessment					
· area & degree of visual intrusion	0	0	1	1	1
· potential impacts on areas of Nat./man-made beauty (photomontages [min.3])	0	1	0	1	1
	0	0	1	1	0

· Social Cost benefit analysis	0	0	0	1	0
compare Social Benefits from extraction	0	0	0	1	0
employment/	0	0	0	1	0
incomes generated	0	0	0	1	0
with Social costs					
environmental/	0	1	0	0	0
cultural/	0	1	0	0	0
ecological/	0	1	0	0	0
landscape damage	0	1	0	1	0
2.8 Other planning constraints					
· rock transport routes	1	0	1	1	1
· soil & soil handling techniques	1	0	1	N/A	N/A
· plant allocation	1	0	0	N/A	0
· storage of aggregate	1	0	1	1	1
· others (name) NOISE	0	0	0	1	0
3.0 Need for Resource					
3.1 Need for resource					
· current/projected end users	1	1	1	1	0
· related applications	0	0	1	1	0
· competitive advantage over other sites	0	0	0	0	0
3.2 Choice of extraction method as against alternatives					
· method of extraction (most suitable)	0	0	0	1	0
· advantage of this method over rest	0	0	0	1	0
· cost benefit analysis of this against alternatives	0	0	0	0	0
· justification of choice	0	0	0	1	0
3.3 Intended use of aggregate					
· list of size of product/s	0	0	0	0	0
· list quantities of each size	0	0	0	0	0
· areas of consumption of produce	1	0	0	1	1
· CB analysis of income against impacts	0	0	0	1	0
3.4 Extent of quarry waste					
· quantitative estimate of waste	0	0	0	0	0
· method of disposal of inert waste	1	0	0	0	0
· method of disposal of other waste	1	0	0	1	0
· location of disposal of waste	1	0	0	1	0
· transport method of waste	1	0	0	0	0

4.0 Technical justification of resource					
· rock sampling & testing (BS812) marked on photos	0	0	1	0	1
· number of samples (min. 8)	0	0	1	0	1
· relative density	0	0	0	0	1
· water absorption	0	0	1	0	1
· aggregate impact value	N/A	N/A	N/A	0	1
· aggregate crushing value	N/A	N/A	N/A	0	1
· copy of result from competent engineering body	0	0	1	0	1
5.0 Major impacts & mitigating measures					
5.1 Environmental					
· noise pollution	1	0	0	1	0
· dust pollution	1	0	0	0	1
· control of such pollution	1	0	0	1	1
5.2 Cultural & visual					
· archeological	N/A	0	0	N/A	1
· historical	N/A	0	0	N/A	1
· access to adjacent sites	1	0	0	1	1
scenic	1	0	0	1	1
historical	N/A	0	0	N/A	1
5.3 Ecology					
· fauna	1	0	0	1	1
· flora	1	0	0	1	1
· access to sites of ecological importance	0	0	0	N/A	1
5.4 Landscape					
· assessment of site characteristic views	1	0	1	1	1
· ways of mitigating present & envisaged impacts	1	1	1	1	1
6.0 Restoration					
6.1 Envisaged site re-use					
· restoration scheme	1	0	1	1	1
· assess social & economic value of such scheme	0	0	0	1	0
on immediate surroundings					
6.2 Tree cover					
· tree planting programme (within 15 yr. of planting)	1	0	0	1	0
planting locations	1	0	0	1	0
tree types/species	1	0	0	1	0
management of scheme	1	0	0	1	0