



Cairo University
Faculty of Engineering
Department of Architecture

Towards Activating the Application of Cultural Heritage Projects through a Sustainable Impact Assessment Methodology

A thesis submitted in partial fulfillment of the requirements of
The Doctor of Philosophy Degree in Architecture

Prepared By

Arch. Passaint Mohamed Massoud

Under the Supervision of

Prof. Dr. Hisham Sameh Hussein

Professor of Architecture

Faculty of Engineering – Cairo University

Prof. Dr. Ayman Hassan Mahmoud

Professor of Architecture

Faculty of Engineering – Cairo University

Dr. Tamer Mohamed Abd-Elaziz

Teacher of Architecture

Faculty of Engineering – Cairo University

2012

يقول تعالى:

﴿ قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ ﴾

سورة الزمر الآية 9

Acknowledgements

Firstly, I sincerely thank God for being able to complete my thesis. I would like to express my greatest thanks to my thesis director, Prof. Dr. Hisham Sameh for all the guidance, support, and encouragement he gave me throughout the process of writing this thesis and during the years of study. I also wish to thank Ass. Prof. Dr. Ayman Hassan Mahmoud for his valuable time and input in my thesis and for his guidance and support. I would like to thank Dr. Tamer Mohamed Abd El-Aziz for all the ideas and inspirations he gave me for this thesis. Special thanks to my parents for their unselfishly support as my best friends. Last, but not least, thanks to my husband for his patience and understanding. His confidence and faith in me have been a constant source of my strength.

God gives success

The researcher

Dedication

I would like to dedicate this thesis to my Mother Soul – who is always in my heart

لللمح عملها في سريبات امل لالجنة

Contents

Table of Contents

Contents	IX
List of Figures	X
List of Tables.....	XVII
List of Acronyms and Abbreviations.....	XVIII
Abstract	XIX
Research Problem	XIX
Research Aim	XX
Research hypothesis.....	XXI
Research Methodology	XXI
Scope	XXII
Research Contents	XXV

PARTI Environmental Assessment Background

Chapter1 –Impact Assessment Role in Sustainable Development

1.1	Introduction.....	3
1.2	Strategic Environmental Assessment (SEA)	4
1.3	Environmental Impact Assessment (EIA).....	5
1.4	Differences between EIA and SEA.....	8
1.5	The necessity of developing an Environmental Impact Assessment (EIA) for most projects.....	10
1.6	Sustainable Impact Assessment (SIA)	11
1.6.1	The link between economic development and sustainable environment.....	13
1.6.2	The carrying capacity of the environment.....	14
1.6.3	Social, economic and environmental interaction in sustainable development	15
1.6.4	The SIA Needs.....	15
1.6.5	The SIA Report.....	16

1.6.6 The decision-making process 18
1.7 Conclusions..... 18

Chapter2 – Sustainable Development Projects and their Impacts

2.1 Introduction 23
2.2 Defining the objectives of the project..... 23
2.3 Sustainable development Projects, alternatives 24
 2.3.1 Alternatives to a single project..... 25
 2.3.2 Inventory of alternatives or options 25
2.4 Identification of criteria to compare alternatives 26
 2.4.1 The Baseline 27
 2.4.2 Selection of alternatives..... 29
 2.4.3 Public opinion 30
2.5 Impacts caused by projects 30
 2.5.1 Positive or adverse..... 31
 2.5.2 Primary, secondary, tertiary. 32
 2.5.3 Measurable or indeterminate 34
 2.5.4 Apparent impacts 34
 2.5.5 Cumulative 35
 2.5.6 Able to be mitigated or not in a greater or lesser degree 36
 2.5.7 Residual impact..... 36
 2.5.8 Spatially related 36
 2.5.9 Temporal related 38
 2.5.10 Irreversible or reversible..... 38
 2.5.11 Likelihood of the impacts..... 40
 2.5.12 Unexpected impacts 40
 2.5.13 Risk effects 41

2.5.14	Residual effects.....	41
2.5.15	Population impact	42
2.6	Interaction between impacts	42
2.6.1	Environment/project interactions.....	43
2.6.2	Social/environmental interactions	43
2.7	Evaluation of impact significance.....	44
2.8	Conclusions	46

Chapter3 – Sustainable Criteria and Indicators
--

3.1	Introduction.....	49
3.2	End and Means Objectives as an Assessment Criteria	49
3.3	Criteria weight.....	50
3.4	Factor Analysis (FA)	52
3.5	Criteria Indicators (threshold).....	53
3.6	Urban Sustainability Indicators	54
3.6.1	Significance of sustainable city assessment	56
3.6.2	Assessment Indicators for Sustainable City	56
3.7	Example for the Indicators of Sustainable Community	60
3.7.1	Seattle	60
3.7.2	Santa Monica, USA	61
3.8	Principles of Designing the Assessment Indicator System for Sustainable City ..	62
3.9	Issues to be considered in Establishing an Assessment Indicator System for Sustainable City.....	63
3.9.1	The scientific foundation	63
3.9.2	Computational methods.....	64
3.9.3	Compromise between perfection and practical demand	64
3.9.4	An Assessment Indicator System for Sustainable City	64

3.9.5 Indicator Explanations 65
3.10 Conclusions 68

Part II Cultural Heritage Development and Conservation

Chapter4: Cultural Heritage Development background

4.1 Introduction 71
4.2 Cultural Heritage 71
 4.2.1 Cultural Heritage types 72
 4.2.2 Tangible & Intangible Heritage 73
 4.2.3 Heritage Cycle 73
4.3 UNESCO’s Definition of Tangible Cultural Heritage..... 74
 4.3.1 Monuments:..... 74
 4.3.2 Groups of buildings:..... 74
 4.3.3 Sites:..... 74
4.4 UNESCO’s Definition of Intangible Cultural Heritage..... 74
4.5 Loss of cultural heritage: Causes and Needs..... 75
 4.5.1 Damages of heritage assets..... 76
 4.5.2 Causes of Heritage loss..... 77
4.6 Protecting and Conserving the Cultural Heritage Site 83
4.7 Cultural Significance: the first step of heritage conservation process. 84
4.8 Cultural heritage conservation needs. 85
4.9 Benefits of conservation. 86
 4.9.1 The social benefits..... 86
 4.9.2 Educational benefits..... 87
 4.9.3 Environmental and financial benefits 88
 4.9.4 Visual aesthetic benefits 89
4.10 Conclusions 90

Chapter5: World Heritage Convention

5.1	Introduction.....	95
5.2	The UNESCO World Heritage Convention.....	95
5.2.1	World Heritage Committee	96
5.2.2	World Heritage Fund.....	96
5.2.3	National and International Protection.....	97
5.3	World Heritage List.....	98
5.3.1	Adding Sites to the List	99
5.3.2	Removing Sites from the List.....	100
5.4	List of World Heritage in Danger.....	100
5.4.1	Adding Sites to the Danger List	100
5.4.2	Removing Sites from the Danger List.....	102
5.4.3	The Middle East and North Africa sites	102
5.5	Conclusions	103

Chapter6- Cultural Heritage of Egypt

6.1	Introduction.....	107
6.2	The effect of Geography on Egyptian Nationalism	107
6.2.1	Natural Unity	109
6.2.2	National Unity	110
6.3	Egyptian Cultural Heritage Conservation	111
6.3.1	Aspects of Official Efforts in the Conservation of Urban Heritage.....	114
6.3.2	Aspects of Non-Governmental Organizations Efforts in the Conservation of Urban Heritage	117
6.4	Al-Azhar Park.....	120
6.4.1	Project Background.....	120
6.4.2	Baseline Information	121

6.4.3	Environmental Objectives.....	122
6.4.4	Social Objectives	126
6.4.5	Economic Objectives	127
6.5	Restoration of the Ayyubid Wall	128
6.5.1	Project Background	128
6.5.2	Baseline Information.....	129
6.5.3	Environmental Objectives.....	131
6.5.4	Social Objectives	134
6.5.5	Economical Objectives.....	135
6.6	Neighbouring District of Darb al-Ahmar.....	136
6.6.1	Project Background	136
6.6.2	Baseline Information.....	137
6.6.3	Baseline Information.....	137
6.6.4	Environmental Objectives.....	140
6.6.5	Social Objectives	141
6.6.6	Economical Objectives.....	143
6.7	Siwa Oasis.....	147
6.7.1	Project Background	147
6.7.2	Baseline Information.....	148
6.7.3	Environmental objectives	149
6.7.4	Social objectives.....	151
6.7.5	Economical objectives	154
6.8	ESNA City Developments.....	157
6.8.1	Project Background	157
6.8.2	Baseline Information.....	158
6.8.3	Environmental objectives	159

6.8.4	Economic objectives	161
6.8.5	Social objectives:	161
6.9	Conclusions about the Role and Importance of Egyptian Historic Environment	162

Part III

Chapter7 - SIA Framework for Cultural Heritage Conservation

7.1	Introduction.....	167
7.2	Defining the Historic Environment.....	167
7.3	Sustainability Impact Assessment Framework.....	167
7.4	Screening.....	168
7.4.1	Baseline Information	168
7.4.2	Illustrative Material	169
7.4.3	Baseline Indicators.....	171
7.4.4	Scope.....	171
7.5	Scoping.....	172
7.5.1	SIA Objectives.....	172
7.5.2	Decision-Making criteria.....	173
7.5.3	Decision-making Indicators	177
7.6	Sustainability Report.....	189
7.7	Recommendations and Mitigation.....	189
7.8	Conclusions	191

Chapter8- Sustainable Cultural Heritage Criteria and Indicators

8.1	Introduction.....	195
8.2	Applied study Hypothesis.....	195
8.3	Applied study limitations	195
8.4	Applied Study Methodology	196

8.4.1	Applied Study Objective.....	196
8.4.2	Applied Study Setting.....	197
8.4.3	Sampling Procedures and Sample Sizes	197
8.4.4	Statistical analysis	198
8.4.5	The used methods of Statistical analysis.....	198
8.4.6	The outputs of Statistical analysis	199
8.5	Conclusions.....	223

Chapter9- Computer Aided Sustainable Impact Assessment for Cultural Heritage Projects (CASIA_{CH})

9.1	Introduction	227
9.2	Applied Study Objectives	227
9.3	Limitation of the Study.....	228
9.3.1	Scope:	228
9.3.2	Phase of application.....	228
9.3.3	Levels of evaluation	228
9.4	The Assessment Tool	228
9.4.1	Flexibility	229
9.4.2	Distributed	229
9.4.3	Implementation of SIA Procedures in Assessment Tool.....	229
9.4.4	Structure of Assessment Tool.....	231
9.5	Assessment Tool Proto Type CASIA _{CH}	234
9.6	Case Study Gournia city Conservation.	239
9.6.1	Historical back ground	239
9.6.2	Baseline information.....	240
9.6.3	Phase of application.....	241
9.6.4	The Levels of Evaluation for CASIA _{CH}	241

9.7 Conclusion 244

Chapter10
Conclusions and Recommendations

10.1 Conclusions 247

 10.1.1 Conclusions about Impact Assessment 247

 10.1.2 Conclusions about Conservation 247

10.2 Recommendations 248

 10.2.1 Recommendations for SIA frame work 248

 10.2.2 Recommendations for Future Data Collection and Monitoring the Importance of Historic Environment 248

 10.2.3 Recommendation to be considered in Identification and Designation of the Historic Environment 249

 10.2.4 Recommendation to be considered in Resourcing and Investment Activity 250

 10.2.5 Recommendation to be considered in Enhancements to economic data 250

Appendix 253
Appendix A. Criteria for Outstanding Universal Value 255
Appendix B. Criteria for Inclusion on the List of World Heritage in Danger 257
Appendix C Online Survey 259
Appendix D Gournas Maps 265
References 279

List of Figures

PART I Environmental Assessment Background

Chapter 1 – Impact Assessment Role in Sustainable Development

Figure 1-1 The different concepts, tools and policy instruments necessary to implement sustainable development objectives.....	3
Figure 1-2 The EIA concept.....	6
Figure 1-3 EIA Framework	7
Figure 1-4. the intersection between three sustainable areas.....	15

Chapter 2 – Sustainable Development Projects and their Impacts

Figure 2-1 Performance matrix.....	27
Figure 2-2 GIS data: terrain (raster—continuous), satellite imagery (raster—continuous), land cover (raster—thematic), soils (polygons), and water bodies (polygons and lines).	28
Figure 2-3 Example weighting scheme for aggregation of objectives	29
Figure 2-4 City of Santiago, Chile.....	32
Figure 2-5 The Aswan High Dam.....	33
Figure 2-6 Qattara Depression	33
Figure 2-7 Cairo ring road.....	35
Figure 2-8 golf city in obour city.....	35
Figure 2-9 sound barriers on 6 October bridge.....	36
Figure 2-10 The upstream dam is the Brazilian hydrostation of Itaipú.....	38
Figure 2-11 the pyramids in Egypt	39

Chapter 3 – Sustainable Criteria and Indicators

Figure 3-1 an example for mean objectives and end objective.....	50
Figure 3-2 Seattle city.....	60
Figure 3-3 Santa Monica beach view.....	61

Part II Cultural Heritage Development and Conservation

Chapter 4: Cultural Heritage Development background

Figure 4-1 culture heritage types:.....	72
Figure 4-2 culture heritage cycle.....	73

Figure 4-3 the existence of both tangible and intangible heritage	75
Figure 4-4 El Darb El Ahmar with its many bazaars and old neighborhoods, famous for their latticed woodwork and original architecture, but many are in need of restoration.	76
Figure 4-5 UNESCO map for MENA countries.....	77
Figure 4-6 Earthquake in Agadir, Morocco, 1960 (photo taken 9 July 1960)	79
Figure 4-7	79
Figure 4-8.....	80
Figure 4-9	80
Figure 4-10 The Tablita market in the heart of the historic center Cairo.....	83
Figure 4-11 Inside Bab al-Futuh is the first market area along the main street, heavy with the smell of fresh lemons, onions, and garlic.	87
Figure 4-12 The earthen structures of Dhangkar Gompa, a Buddhist monastery in the western Himalayas, have survived for nearly a thousand years but are under threat from inappropriate interventions, seismic vibrations, and a changing climate. Photo: c Marek Kalmus, 2005.	88
Figure 4-13	89
Figure 4-14 Hamm Am Turkish Baths, Tetovo, Macedonia. U.S. Embassy Skopje.....	90

Chapter5: World Heritage Convention
--

Figure 5-1 Florence, Italy. The early entries on to the World Heritage List showed a strong bias in favors of European sites. The historic centre of Florence, symbol of the Italian Renaissance, was inscribed as a World Heritage Site in 1982.	98
--	----

Chapter6- Cultural Heritage of Egypt

Figure 6-1 Political Map of Northern Africa and the Middle East.	108
Figure 6-2 the Egyptian deserts	109
Figure 6-3 Different Views for the Nile in Egypt.....	110
Figure 6-4 the unity between churches and mosques in different places in Egypt	111
Figure 6-5 Examples of Egyptian urban heritage sites.....	113
Figure 6-6 maps of Egypt with no details	114
Figure 6-7 shanty areas or low-level urban communities which surround archaeological sites.....	115
Figure 6-8 An aerial view of the project site shows the topography of the Ahar Park after master grading (2000). On the edge of the site it's the uncovered Ayyubid city wall (12 th	

century) and to the right the Darb al-Ahmar district In the distance two major landmark can be seen: to the left Salah al-Din Cs Citadel and to the right; the complex of the Sultan Hassan Mosque..... 119

Figure 6-9 old cairo pic before Project..... 120

Figure 6-10 The Park site in 1992, before work commenced looking to the south. In the distance to the left is the Citadel of Salah al-Din and in the center, the minarets of the Sultan Hassan Mosque complex..... 121

Figure 6-11 An aerial view of the southern water tank in 1999 (seen from the south), being integrated into the emerging new Park topography At the bottom, in the centre, a prototype of typical pavements, pergolas and water features of the future Park main spine..... 123

Figure 6-12 the three buildings (Citadel View Restaurant, Lakeside Café and entrance building)..... 124

Figure 6-13 variety of styles from different periods and different regions..... 125

Figure 6-14 Specialist plant nurseries were created, both on site and outside Cairo 126

Figure 6-15 Children playing in the fountain..... 127

Figure 6-16 The southern section of the Ayyubie city wall and the adjacent Mosque of Aq Sunqur "Blue Mosque" and Khayrbek. first: Conditions in the 19th century (David Roberts) second: Conditions in 1992 show the wall buried beneath heaps of rubble and debris..... 129

Figure 6-17 Map of Cairo around 1800 as surveyed by the French expedition under Napoleon. Clearly visible are the hills of Darassa. It is also clear that 200 years ago the old city already abutted the Ayyubid wall..... 130

Figure 6-18 restoration for the wall..... 131

Figure 6-19 The turrets of the central section of the Ayyubid wall were almost buried in debris in 1994, before work on the Park began. 132

Figure 6-20 The most prominent tower of the Ayyubid wall (Bab al-Mahruq) still buried in debris (1994). A mason cutting stone for wall restoration..... 133

Figure 6-21 The pilot restoration project (between towers 5 and 7) under implementation..... 133

Figure 6-22 Rooftop view of the Aslam neighbourhood in Darb al-Ahmar illustrating the dense existing housing fabric, much of which is in poor condition and in need of upgrading.	137
Figure 6-23 view of the main spine of Darb al-Ahmar; taken in the 1920s and, opposite a typical neighbourhood street as it appears today.....	139
Figure 6-24 Umm al-Sultan Shaaban mosque and minaret restoration project.	141
Figure 6-25 the primary health care clinic.....	142
Figure 6-26 the skills-training programmes	142
Figure 6-27 local master craftsmen and technicians	143
Figure 6-28a sustained development for the area.....	144
Figure 6-29 Siwa Oasis.....	147
Figure 6-30 Siwa remains one of the best places to buy traditional local handicrafts.	148
Figure 6-31 ancient temple in siwa.....	149
Figure 6-32 Ceilings are made of palm beams, while entrances, windows and fixtures are made of olive wood.	150
Figure 6-33 kershef material used in building	151
Figure 6-34 the Siwan buildings historic assets	154
Figure 6-35 the traditional embroidery of Siwan women.	155
Figure 6-36 The organic agriculture in Siwa	156
Figure 6-37 Esna City View the minaret and the temple	157
Figure 6-38 Esna historic Assets.....	158
Figure 6-39 Esna Temple ceiling.....	159
Figure 6-40 Esna development will be no Traffic inside.	160
Figure 6-41	160
Figure 6-42	161

Part III

Chapter7 - SIA Framework for Cultural Heritage Conservation

Figure 7-1 Impact Assessment System.....	168
Figure 7-2 Point data map in GIS software	169
Figure 7-3 the state of project after and before development and conservation	170
Figure 7-4 The Scoping Stage hierarchy of Data and Evaluation.	172
Figure 7-5 The Assessment Process in Scoping Stage	177

Chapter8- Sustainable Cultural Heritage Criteria and Indicators

Figure 8-1 Steps in applied survey data analysis 196

Figure 8-2 3D chart representing results of correlation table between the environmental variables with each other 201

Figure 8-3 3D chart representing results of correlation table between the social variables with each other 203

Figure 8-4 3D chart representing results of correlation table between the economic variables with each other 204

Figure 8-5 3D chart representing results of correlation table between the environmental variables with social variables. 204

Figure 8-6 3D chart representing results of correlation table between the economic variables with social variables. 206

Figure 8-7 3D chart representing results of correlation table between the economic variables with environmental variables..... 208

Figure 8-8 Environmental Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor 212

Figure 8-9 Social Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor..... 212

Figure 8-10 Economic Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor..... 213

Figure 8-11 Main Objective differences between users' evaluation mean, with consideration of calculated evaluation factor. 213

Figure 8-12 Main objectives evaluation by public users in the participation process for each project of case study..... 214

Figure 8-13 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Environmental objective)..... 215

Figure 8-14 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Social objective).....216

Figure 8-15 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Economic objective).....217

Figure 8-16 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).217

Figure 8-17 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Social objective).....218

Figure 8-18 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Economic objective).....219

Figure 8-19 suggested format (Radar technique) for displaying how Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).219

Figure 8-20 suggested format (Radar technique) for displaying Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Social objective).....220

Figure 8-21 suggested format (Radar technique) for displaying how Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Economic objective).....220

Figure 8-22 suggested format (Radar technique) for displaying how Esana Oasis project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).221

Figure 8-23 suggested format (Radar technique) for displaying how Esana Oasis project was evaluated by public users in the participation process in each sub-criterion (social objective).....222

Figure 8-24 suggested format (Radar technique) for displaying how Esana Oasis project was evaluated by public users in the participation process in each sub-criterion (Economic objective).....222

Chapter9- Computer Aided Sustainable Impact Assessment for Cultural Heritage Projects
(CASIA_{CH})

Figure 9-1 The SIA Tool Interacting steps 231

Figure 9-2 the system hierarchy levels. 232

Figure 9-3the architecture model for program..... 234

Figure 9-4 Start screen of the CASIA_{CH} tool 235

Figure 9-5 Introduction to the several possible cases in CASIA_{CH}..... 235

Figure 9-6 Personal Information and Selecting the Case 236

Figure 9-7 project Information Entry Screen for Case1 236

Figure 9-8..... 237

Figure 9-9..... 237

Figure 9-10 the alternative final report..... 238

Figure 9-11 Gournna city 239

Figure 9-12 Application of Case2. 241

Figure 9-13 Project Data entry 241

Figure 9-14 attaching files in Screening Stage. 242

Figure 9-15..... 243

List of Tables

PART I Environmental Assessment Background

Chapter1 –Impact Assessment Role in Sustainable Development

Table 1-1 showing three different conditions, Sustainable, Critical and Destructive, with values for different indicators..... 12

Table 1-2 tools for integrated assessment..... 13

Chapter3 – Sustainable Criteria and Indicators

Table 3-1 Examples of threshold units 53

Table 3-2 An Assessment Indicator System for Sustainable Community in Beijing..... 58

Table 3-3A Sustainable City Assessment Indicator System of Ji’nan, China 59

Table 3-4 Assessment Indicators 68

PART II

Chapter6- Cultural Heritage of Egypt

Table 6-1 Culture Heritage Conservation sustainable objectives 163

PART III

Chapter7 - SIA Framework for Cultural Heritage Conservation

Table 7-1 Environmental Sub Objectives and Decision-Making Criteria 173

Table 7-2 Social Sub Objectives and Decision-Making Criteria..... 175

Table 7-3 Economic Sub Objectives and Decision-Making Criteria..... 176

Table 7-4 suggested table for the Screening stage for any conservation project 179

Chapter8- Sustainable Cultural Heritage Criteria and Indicators

Table 8-1 code entered for each sub objective 199

Table 8-2 The Mean Factor and the Standard Deviation of each Sub Criterion..... 200

Table 8-3 Correlation Matrix 202

Table 8-5 factor analysis communalities table 210

Table 8-6 evaluation factor for each sub criterion..... 211

Table 8-7 The Mean of the Main Objectives for each Case Study 214

List of Acronyms and Abbreviations

List of Acronyms and Abbreviations	
CBA	Cost-Benefit Analysis
CH	Cultural Heritage
EC	European Communities
EIA	Environmental Impact Assessment
ESCIA	Environmental and Socioeconomic Impact Assessment
ESSD	Environmentally and Socially Sustainable Development
FA	Factor analysis
GDP	Gross Domestic Product
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS	The International Council on Monuments and Sites
IRCICA	Research Centre for Islamic History, Art, and Culture
IUCN	International Union for the Conservation of Nature and Natural Resources
MENA	Middle East and North Africa
NGOs	Non-Governmental Organizations
NGOS	Non-Governmental Organizations
SCA	Supreme Council of Antiquities
SD	Sustainable Development
SEA	Strategic Environmental Assessment
SIA	Sustainable Impact Assessment
SRS	Simple Random Sampling
UK	United Kingdom
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization

Abstract

Environment, economics, and society, the three dimensions of sustainable development, are brought here to define a singular approach on how to deal and go beyond the traditional aspects of heritage conservation and safeguarding. On today's world, heritage is no longer just a memory or a cultural reference, or even a place or an object. Heritage is moving towards broader and wider scenarios, where it becomes often the driven forces for commerce, business, leisure and politics. The cultural heritage sites receive a great benefit from its past generations and the present generation as a source of employment, career and income. As a result, it has created the economic, social cultural value in the community reflected in the forms of arts and crafts and its ways of life social, economic and cultural conditions, all of which have made this community different.

For these above reasons the research examines the significance and role of urban conservation for cultural heritage in sustainable development and proposes a methodological framework for reviewing the Sustainable Impacts "Environmental, Economic and Social" in conservation and development plans. The aim for this impact assessment to be helpful in the decision making process about conservation and development projects.

Research Problem

Heritage is often seen through its cultural definition. Fig1 However; sustainable development brings heritage concepts to another dimension, as it establishes profound relationships with economics, environment, and social aspects.

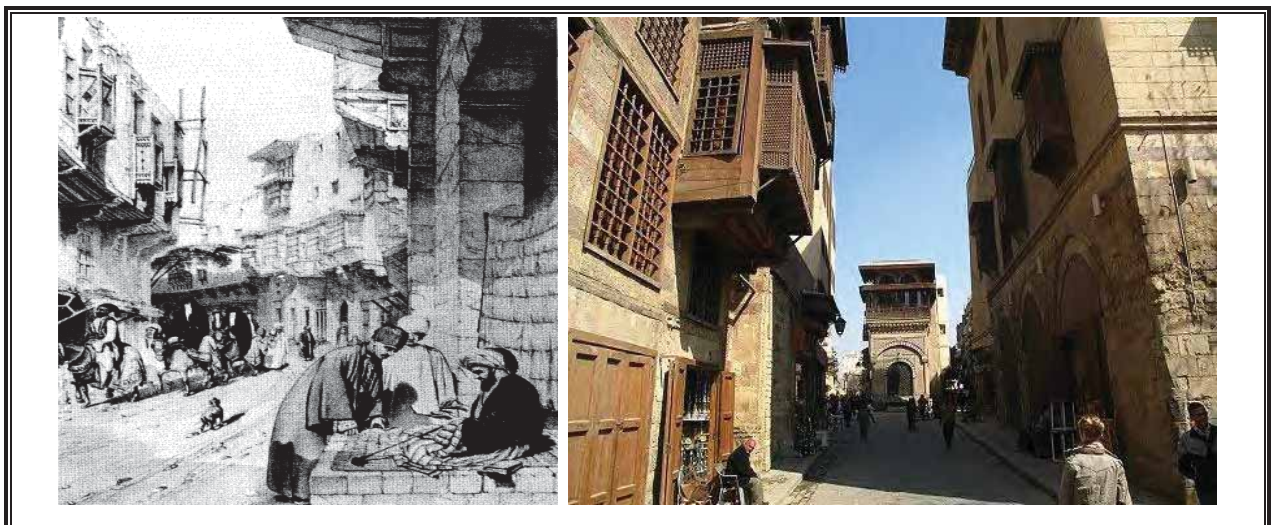


Figure 1the culture definition for heritage

A growing number of studies have sought to value the benefits of heritage. However, these have often tended to focus on specific buildings (for example, Mosques, churches and historic houses) or high profile historic sites. Whilst important, these only form part of the historic environment, which is a much broader concept encompassing streets, spaces, landscapes, parks and gardens, people's homes and all physical remains of past human activity. Researches on the economic, social and environmental benefits of the historic environment has been relatively limited and often of a qualitative nature. **There isn't a specified methodological framework for reviewing the Sustainable Impacts on Conserving and developing the historic Environment projects especially the culture heritage ones.**

Research Aim

The aim of the thesis is to propose Sustainable Impact Assessment Tool that works on cultural heritage development projects.

To fulfill the research's goal, the following objectives must be achieved:

1. Discussing different concepts involved in the environment assessment procedure.
2. Explaining the necessity of developing a SIA for most projects.
3. Analysis of the components to be considered in an SIA:
 - The listing of projects or alternatives to be evaluated;
 - The significance of impacts.
4. Explore the different criteria used to appraise these projects;
 - The values linking each criteria with the corresponding project;
 - The threshold values given to each criterion;
 - The weight assigned to criteria and perhaps to projects;
5. Explain the benefits of conservation.
6. Discussing different heritage convention.
7. Scoping on the culture heritage in Egypt.
8. Setting out the objectives, decision-making criteria and indicators to be used in undertaking the assessment.
9. Identifying the cultural Heritage criteria and its indicators. (using a questionnaire)
10. Valuing the criteria weights for cultural heritage projects.(using a statics analysis)

- Proposes a digital tool by which the environmental, economic, and social impacts of the conservation projects could be identified and evaluated, and decisions could be taken to upgrade and improve the conservation program. Also it could be used to evaluate different conservation alternatives and determine the optimum solution.

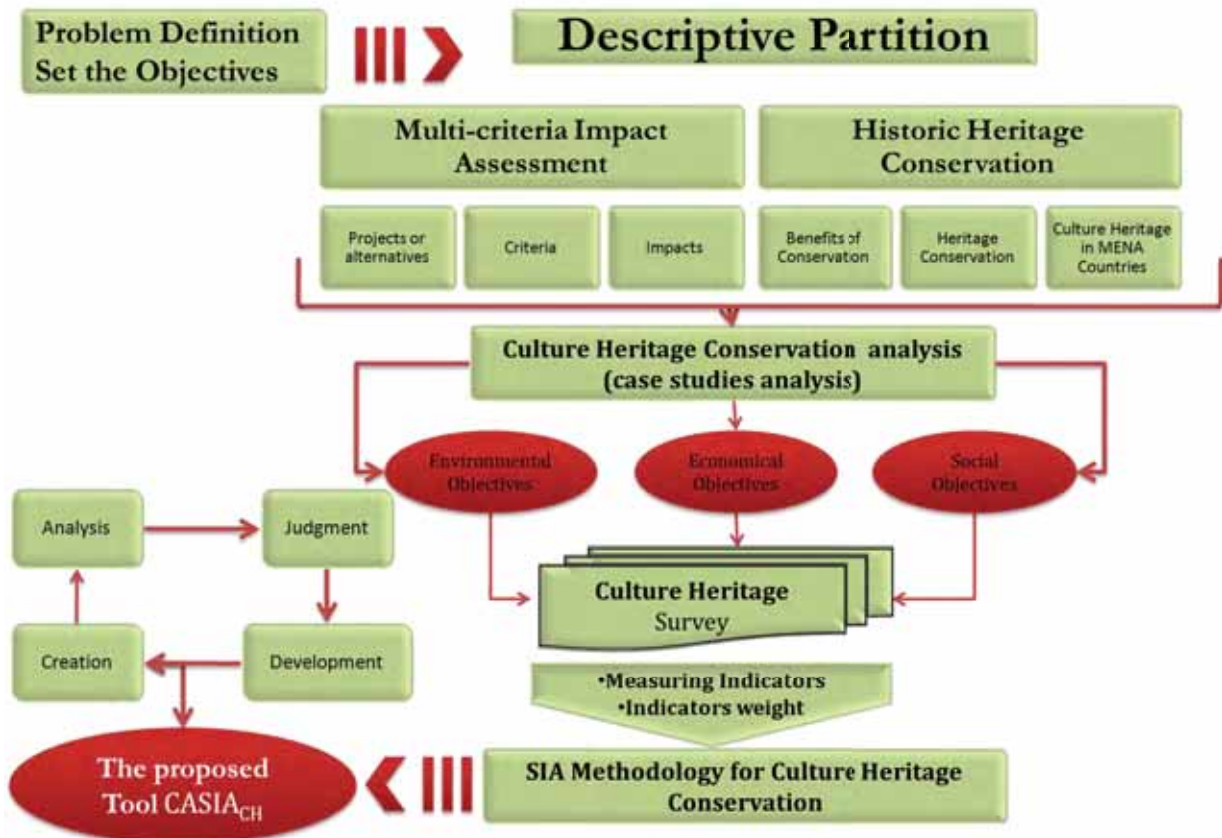


Figure. 2 the research data flow

Research hypothesis

The research has hypothesized that there is a connecting relation between sustainable development dimensions with each other, in particular related to cultural heritage conservation (enlarged to cultural resources). Relevant dimensions are environmental, economic, and social.

Culture heritage conservation objectives are expressed in a framework of culture conservation objectives, sub objectives down to specific indicators. These indicators (pressure, state, response) determine the n dimension of the solution corridor.

Research Methodology

The research methodology embraces a mixed strategy that is needed to investigate different components of the study. It comprises literature review, survey, data collection

(including documents and interviews), analysis; as well as developing and testing the proposed methodology. This integrative approach is increasingly implemented to reach the previous mentioned objectives; the following methodologies will be adopted; the theoretical method, the analytical method, and the deductive method.

The Theoretical Approach: Reviewing literature, books, and magazines....etc. - This methodology will be applied to objectives 1 till objective 6. The result will be in PART I and PART II

The Analytical Approach: (Inductive approach) Analyzing and processing collected data. - This methodology will be applied to objectives 7, 8, 9 the result will be Chapter 7, 8 in PART III.

The Deductive Approach: this methodology will be applied to objective 10-11 and the result will be Chapter 9, 10 in PART III.

Scope

The context of this research deals with the tangible culture heritage and its sustainable impacts towards the development for such projects.

The proposed Sustainable Impact Assessment framework will be applied on the area of international conservation projects more generally, whether conducted by governments, international donors, or NGOs. A number of case studies were selected to find the relation between the three main objectives for Sustainable Conservation, and to find the sub objectives evaluating weight. These cases were chosen to represent a range of projects in terms of their geographical location (including urban and rural) and size and type of Culture reference in Egypt.

The Sustainability Impact Assessment (SIA) developed in this thesis aims to identify and describe the magnitude and the nature of each sustainability sub objective in a way that can be easily understood and compared with other sustainability sub objective. Each sustainability sub objective identified needs to be linked with cultural heritage conservation that is considered to be its origin.

The analysis is carried out in four stages, between which there is some feedback:

- Define the task and role of the study. This entails a description of historic environment which the Sustainability Impact Appraisal is needed. The first stage is therefore to define the baseline.
- A comprehensive Screening of the initial effects of the conservation to determine which areas potentially contain sustainability impacts; and Scoping, to establish the appropriate coverage and methods to be used for each of these more detailed analyses.
- Assess and compare the main sustainability impacts and analyze the quality of the information available.
- Develop a response to the sustainability impacts thus identified: the mitigation and enhancement process described above.

These four stages represent decision points along the path of identifying the causal chain or process of how a potential sustainability impact may arise. Between these points, the study applies a variety of analysis techniques, both quantitative and qualitative.

The reach will focus on the sustainable objectives and sub objectives related in the scoping stage of assessment, and sets out their relative weights to compare different conservation project alternatives.

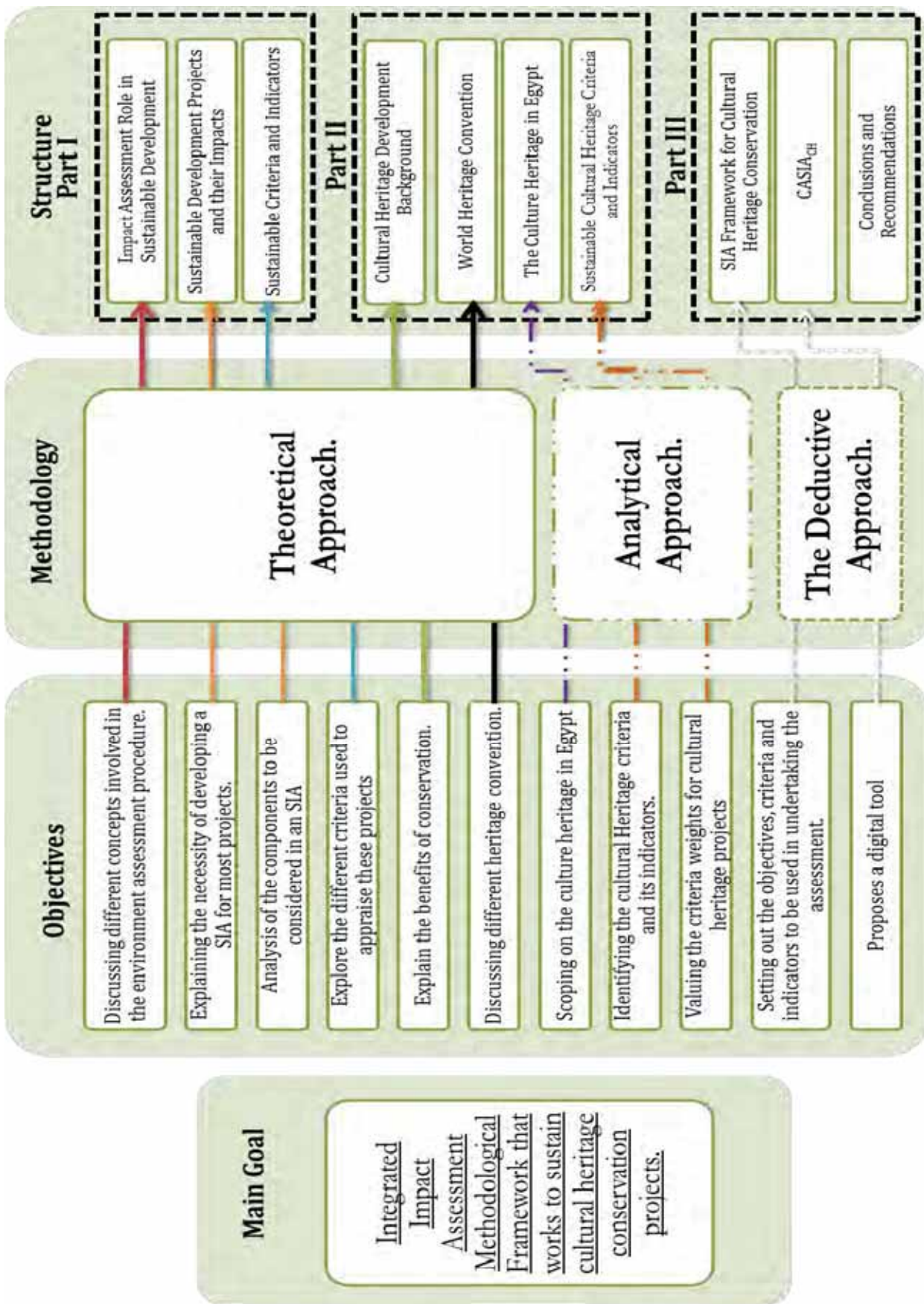


Figure. 3 Research Structure

Research Contents

The research comprises three parts presenting the following:

Part I: Environmental Assessment Background

Chapter1 – Impact Assessment Role in Sustainable Development

This chapter discusses the general concept for impact assessment and its kinds, through introducing the Environmental Impact Assessment (EIA), Environmental Impact Statement (EIS), Strategic Environmental Assessment (SEA), Environmental and Socioeconomic Impact Assessment (ESIA) and the link between economic development and sustainable environment by discussing the Social, economic and environmental interaction in sustainable development.

Chapter2 – Sustainable Development Projects and their Impacts

This chapter highlights the process for alternative selection and its steps, by discussing Projects, alternatives or options and the types of impacts caused by project.

Chapter3 –Sustainable Criteria and Indicators

This chapter discusses how to identify the criteria and how to compare between alternatives sustainable impact assessment and its steps in detail. It also highlights the methodology for the assessment systems and setting out a comprehensive Index.

Part II: Cultural Heritage Conservation

Chapter4- Cultural Heritage Development Background

This chapter highlights the culture heritage as scope of studying field, by discussing the meaning of culture heritage and the mainstream of modern town planning and the alternative visions for urban planning. Then, the chapter will explore, the sustainable elements for culture heritage cites.

Chapter5- World Heritage Convention

This chapter highlights the world movements towards the heritage conservation. Then, the chapter will explore, the World heritage list and the list world heritage in danger.

Chapter6-The Culture Heritage in Egypt

This chapter highlights the culture heritage in Egypt and their characters and analyzing examples of these zones through identifying the sustainable development objectives reached in each example.

Part III: SIA Methodology for Cultural Heritage Conservation

Chapter7 - SIA Framework for Cultural Heritage Conservation

This chapter sets the methodological framework for the sustainable impact assessment for culture heritage projects.

Chapter8- Sustainable Cultural Heritage Criteria and Indicators

This is the practical sector in the research where a survey will be distributed and analyzed through SPSS program and the criteria weight will be calculated in an equation

Chapter9- Computer Aided Sustainable Impact Assessment for Cultural Heritage Projects (CASIA_{CH})

This chapter introduces a Prototype Assessment tool-CASIA_{CH}- and analyzes its steps in different stages of application. An application of a case study (Gourna city) using the this Assessment tool will be applied.

Chapter10- Conclusions and Recommendations

This research has reached several general conclusions through using the theoretical study or the practical one while depicting its various parts. The research also contains some recommendations for the Architectural Designer and the Educational Organizations.

PART I Environmental Assessment Background

Chapter 1 – Impact Assessment Role in Sustainable Development

- 1.1 Introduction
- 1.2 Strategic Environmental Assessment (SEA)
- 1.3 Environmental Impact Assessment (EIA)
- 1.4 Differences between EIA and SEA
- 1.5 The necessity of developing an Environmental Impact Assessment (EIA) for most projects
- 1.6 Sustainable Impact Assessment (SIA)
- 1.7 Conclusions

1.1 Introduction

A sustainable development of the built environment has to take into account the specific environmental impact of one human being can enormously vary according to the society in which he lives. Sustainable development of towns has become both a slogan and a deep hope for specialists as well as users. To define and assess the sustainable development of towns, urban fragments or neighbourhoods, a basic physical framework of the urban metabolism is necessary. Fig1-1. This chapter provides information and guidance on Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA). Particular emphasis is given to concepts, procedures and tools that are used currently or are potentially relevant in implementing an integrated approach to impact assessment of development policies, it tries to provide comprehensive coverage of generic elements of good practice that appear to be widely applicable. It also attempts to indicate some of the possible future directions for integrated assessment based on current trends and initiatives.

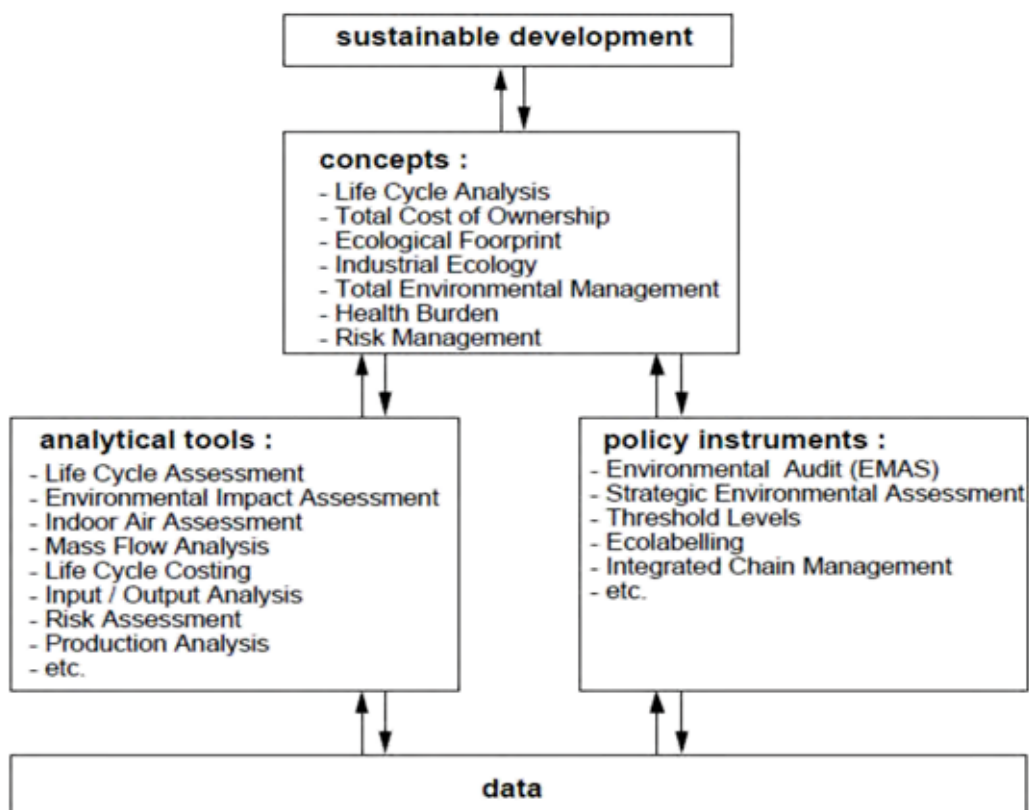


Figure 1-1 The different concepts, tools and policy instruments necessary to implement sustainable development objectives

Source: Society of Environmental Toxicology and Chemistry: Towards a Methodology for Life-Cycle Impact Assessment, Bruxelles, 1996.

1.2 Strategic Environmental Assessment (SEA)

SEA can be defined as the formalized, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or program and its alternatives, the preparation of a written report on the findings, and the use of the findings in publicly accountable decision making.¹ This process applies primarily to development-related initiatives that are known or likely to have significant environmental effects, notably those initiated individually in sectors, such as transport and energy, or collectively through spatial or land use change. As a consequence, SEA can be defined as a process whose output is information used to sustain decision-making on issues related with strategic planning. SEA is applied to the evaluation and selection of policies when all significant environmental impacts are considered. The key word here is "policies", the effects of implementing these policies will have a great incidence in the population because it can affect the whole country.

The aims of SEA can be summarized into two main categories:²

- promote environmentally and socially sustainable development (ESSD) by:
 - anticipating and preventing adverse effects at source;
 - considering and identifying best practicable environmental options;
 - Ensuring policies and plans are consistent with ESSD goals and safeguards.
- strengthen and streamline project EIA by:
 - environmental "clearance" of policy and planning issues that are addressed either ineffectively or not at all by EIA (need, justification and major alternatives);
 - early warning of cumulative effects from programmatic or other, spatially related actions;
 - Pre-examination of potentially significant effects of specific proposals, thereby reducing the time and effort necessary for EIA (when it can be tiered to SEA as described later).

¹ Thérivel, R. and Minas, P.: 2002, "Ensuring effective sustainability appraisal", *Impact Assessment and Project Appraisal*. 20, 81--91 - Beech Tree Publishing, Surrey, U.K.

² Sadler, B. (2001a) A Framework Approach to Strategic Environmental Assessment: Aims, Principles and Elements of Good Practice, in Dusik, J. (ed.) *Proceedings of International Workshop on Public Participation and Health Aspects in Strategic Environmental Assessment*. Regional Environmental Centre for Central and Eastern Europe, Szentendre, Hungary (pp.11-24).

1.3 Environmental Impact Assessment (EIA)

EIA is a process with several important purposes; it is wider in scope and less quantitative than other techniques, such as cost-benefit analysis. It is an aid for decision-making. But it does help to clarify some of the trade-offs associated with a proposed development action, which should lead to more rational and structured decision-making. The EIA process has the potential to be a basis for negotiation between the developer, public interest groups and planning regulator. For the decision-maker, for example the local authority, EIA is a systematic analysis of the potential impacts that a project can produce on the environment, and it tries to find a balance between gains and losses. This analysis involves:¹

- Identification of the objective;
- Continues with recognition of the alternatives or projects;
- Goes on with the selection of criteria to be used to gauge the contribution of each project to the achievement of the objective through the established criteria;
- Advances the task of assessing the project impacts and their effects;
- Gathers information and data regarding the effects of the project;
- Makes the selection of alternatives;
- Proposes the monitoring process;
- Establishes the format for the Environmental Impact Assessment;
- Status report.

At the beginning, commencing with the implementation of this discipline, EIA was project specific, working at the project level. This is an early definition and nowadays the term applies to the analysis and assessment of environmental impacts produced by many projects or alternatives options subject to many criteria, i.e., how each project affects the different resources involved in its development.²

EIA is considered as the generic name applied to a set of appraisal techniques; however, there is a technique which is called EIA. It is a very important one, because even with its drawbacks and short of providing a decision rule for aggregating environmental impacts, it gives information and data which are common to all other techniques employed.

¹ Nolberto Munier, *Multicriteria Environmental Assessment*, ©2004 Kluwer Academic Publishers P.7

² *Ibid.*

Probably the first question is if EIA is mandatory for all classes and type of projects. The answer is that in general it is not, but the decision depends on regulations in different countries. Some projects under a certain size do not necessitate an EIA, others need one whatever the size. Projects requiring EIA if they exceed a certain size:

- Urban development's;
- Industrial developments;
- Certain type of chemical factories;
- Waste water treatment plants stations;
- Landfills.

In EIA two stages can be considered:

- Project appraisal. In here the environmental assessment report is reviewed and public consultation takes place.
- Project evaluation. In this stage proceeds the evaluation of the environmental assessment report, and the corresponding mitigation plan.

The concepts of assessment, quantification, evaluation and monitoring in EIA are now introduced. Fig1-2



Figure 1-2 The EIA concept.

Assess: the impact of actions to be generated by the project.

Quantify: the magnitude of the impact.

Evaluate: analyze the e

ffects that those actions have produced in human health, well-being and in the environment.

Monitor: Compliance of the measures proposed to mitigate the project effects as well as verification that the residual effects are within the limits imposed.

EIA can provide a framework for considering location and design issues and environmental issues as parallel. Fig1-3. It can be an aid to the formulation of development actions, indicating areas where the project can be modified to minimize or eliminate altogether the adverse impacts on the environment. EIA can be the signal of

potential conflict to the developer; developers may use the process to negotiate solutions that may eliminate or offset negative environmental impacts, reduce local opposition and avoid costly public inquiries. The consideration of environmental impacts early in the planning life of a development can lead to environmentally sensitive development which in the end also leads to positive effects for the developer. The early stages of the EIA process are typified by several interacting steps. These include deciding whether an EIA is needed at all (screening), consulting with the various parties involved to seek to produce an initial focus on some of the key impacts (scoping), and an outline of possible alternative approaches to the project, including alternative locations, scales and processes. Scoping and alternatives can greatly improve the quality of the process. Early in the process the analyst will also wish to understand the nature of the project concerned, and the environmental baseline conditions in the likely impacted area. Projects have several dimensions (e.g. purpose, physical presence, processes and policies, over several stages in the project life-cycle); a consideration of the environmental baseline also involves several dimensions. For both projects and the impacted environment, obtaining relevant data may present challenges.

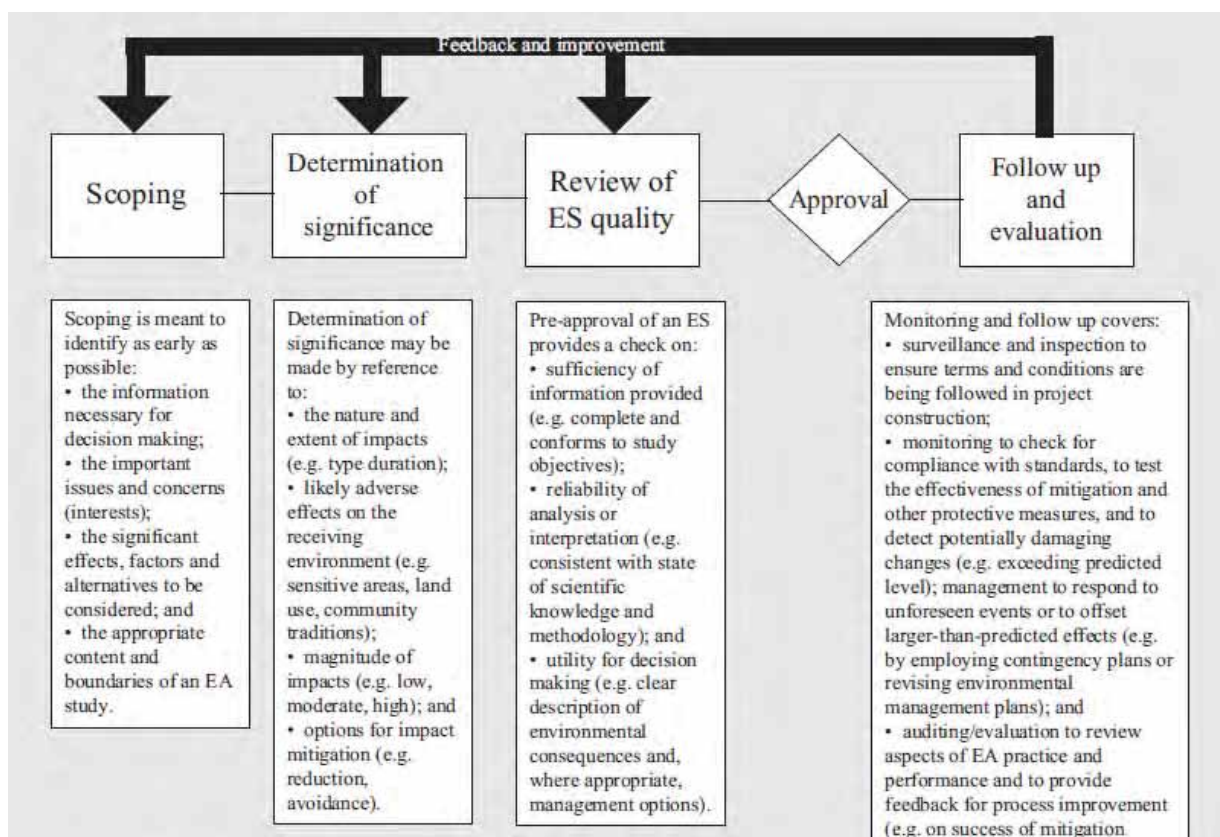


Figure 1-3EIA Framework

Source Sadler, B. (1999) A Framework for Environmental Sustainability Assessment and Assurance, in Petts, J. (ed.) *Handbook of Environmental Impact Assessment* (Vol. 1). Blackwell Scientific, Oxford. (pp.12-32).

1.4 Differences between EIA and SEA

SEA purpose is similar to EIA's and most of the techniques are also the same, but they differ in their utilization. Although SEA works on policies, plans and programs are often all described as "strategic", they are not the same thing, and may themselves require different forms of environmental appraisal. A policy is generally defined as an inspiration and guidance for action, a plan as a set of co-ordinated and timed objectives for the implementation of the policy, and a programme as a set of projects in a particular area.¹. In theory policy, plans and programs are tied; a policy provides a framework for the establishment of planes, plans provide frameworks for programs, and programs lead to projects. Various arguments have been put forward for a more strategic level of EIA, most of which relate to problems with the existing system of EIA.

- EIAs tend to focus on the more straightforward process of describing the project and the baseline environment, with much less consideration of impact identification, prediction and evaluation.
- EIAs react to development proposals rather than anticipating them, so they cannot steer development towards environmentally "robust" areas or away from environmentally sensitive sites.
- EIAs depend on the developer (who has to carry out the assessment). It needs to be integrated by developers and their consultants much more into planning and decision- making.
- EIAs do not adequately consider the cumulative impacts caused by several projects, or even by one project's subcomponents or ancillary developments.
- EIAs cannot fully address alternative developments or mitigation measures, because in many cases these alternatives will be limited by choices made at an earlier, more strategic level. In many cases a project will already be planned quite specifically, with irreversible decisions taken, by the time an EIA is prepared.
- EIAs often have to be carried out in a very short period of time because of financial constraints and the timing of planning applications. This limits the amount of baseline data that can be collected, and the quality of analysis that can be undertaken.

¹ Wood, C. 1991. EIA of policies, planes and programmes. EIA Newsletter 5, 2-3.

The main distinction of SEA is in its larger scope, in the longer time frames, in the earlier application in the decision process and in new procedural aspects, which are still under development. By being carried out earlier in the decision-making process and encompassing all of the projects of a certain type or in a certain area, SEA can ensure that alternatives are adequately assessed, cumulative impacts are considered, the public is fully consulted, and decisions concerning individual projects are made in a proactive rather than reactive manner. SEA is also seen as a central step in the achievement of sustainable development. On the other hand, the implementation of SEA is fraught with both technical and procedural problems. On the technical side, the many potential future developments spread over large area can lead to great analytical complexity. Information about existing and projected future environmental conditions and about the nature, scale and location of future development proposals is usually very limited, so the impacts of these developments cannot be predicted precisely. The large number and variety of alternatives to be considered further complicates the process, as do requirements for public participation.

There is a general lack of information about SEA, and a dearth of case studies where SEA has been successfully applied, particularly to policies, so there are few models of how to carry out SEA. More intractable than these technical/information problems are those inherent in the policy-making process. Many policies, plans and programmes evolve in an incremental and unclear fashion. Alternatives are often omitted in EIA; for instance Jones et al. (1991)¹ note that only about one-third of UK Environmental Impact Statements discuss alternatives. When alternatives are discussed, they are not well handled. The EC's five-year review notes that "evaluation of the environmental impact of certain projects is taking place too late in the development planning and decision-making process. In effect this has the result of removing from consideration the possible adoption of alternatives both to the individual project under consideration as well as to its particular location or route".²

¹ Jones, C. E., et al. 1991. UK environmental statements 1988-1990: an analysis. Occasional Paper No. 29, Department of Planning and Landscape, University of Manchester

² Commission of the European Communities. 1993. Report from the Commission on the implementation of Directive 85/337/EEC of April 1993. COM (93) 28 final. Brussels: CEC.

1.5 The necessity of developing an Environmental Impact Assessment (EIA) for most projects

Many reports mention the impacts produced by the projects and to some extent the mitigation measures; however, especially in the social sector this information is often missing, since there are generally alternatives or options for a project, but many times there are none for the social aspect. For instance, in the case of the construction of a dam, where the formed lake will flood a nearby town, there is for sure a provision that a new town will be constructed in another place and its inhabitants relocated, but usually there are no other alternatives regarding this part of the project.

- Have the people been consulted about other options? Are they happy with the monetary compensation offered for the flooding of their arable land?
- Does the relocation area have the same characteristics, so as to enable people to continue with their activities?
- Is there any provision for the people to buy electricity at a lower price considering the upsetting of their way of life?
- If the people are relocated in a nearby existing town, what is the quality of the services they can expect regarding education, healthcare, utilities, etc.?

Regarding the environment, similar questions arise. For instance:

- Is there a waste management plan in place to handle wastes from the project during the construction and operation stages?
- Is there a procedure in place when involuntary spills or fuel impregnate the ground? If so, what is the remediation procedure?

Many definitions have been proposed for economic development. In essence, it is usually a long term process that promotes growth, encourages competitiveness, increases employment opportunities and wages, enhances higher education, reduces poverty, diminishes inequalities, etc. It is obvious that economic development offers a better standard of life when measured in the terms above mentioned; however, most often that improvement places a heavy burden on the environment, because it also produces pollution, depletes non-renewable resources, increases wastes, uses more water, etc.

Considering all of the above, it is necessary to bear in mind that any EIA study has to take into account the potential advantages of a project, or different projects, that aim to

improve the quality of life or to generate an economic benefit, but at the same time has to reflect the damages that the environment will suffer because of this economic undertaking. Such progress cannot be stopped since our world needs increasing use of natural resources to build roads and railways for better transportation, to supply clean and abundant drinking water, to provide adequate health care, to build more houses and commercial centers, to manufacture more equipment for better communication, etc.

On the other hand it is necessary to think deeply about available resources, either non-renewable such as minerals and oil, or renewable like land, water, air, forest, etc. The trouble is that even renewable resources are used to such an extent that they can be depleted, such as fish, forests, land, and of course water. So, how can these two opposite aims be harmonized, that is to promote economic development but at the same time to keep resources available for generations to come. This is in reality the main goal of an EIA study, since it has to find equilibrium, a balance, between gains offered by a project against losses that the society is willing to accept in the quality of their environment.

In conclusion, it is necessary to prepare an EIA that details all the measures to be taken in order to properly address such issues

1.6 Sustainable Impact Assessment (SIA)

To prepare an environmental socioeconomic impact assessment it means in other word sustainable impact assessment where "Sustainability is the development which meets the needs of the present without compromising the ability of future generation to meet their own needs." ¹ It worth noticing how economic development, when it exceeds a certain limits, puts so heavy a pressure on the sustainable resources that it destroys them. It is possible to use sustainability indicators as another type of criteria, especially in multi-criteria analysis.

Table1-1

¹ World Commission on Environment and Development, —Our Common Future,|| Oxford University Press, New York, 1987. p. 4

Table 1-1 showing three different conditions, Sustainable, Critical and Destructive, with values for different indicators
 Source: Dennis. L. Meadows, in November 1994 at the Eighth Toyota Conference in Japan. URL: <http://www.unu.edu/unupress/unupbooks/uu03pe/uu03pe0c.htm>

Human activity	Sustainable	Critical	Destructive
Population increase	< 0.5% per year	1.0 -1.5 % per year	>2% per year
Economic development	3% < GNP < 5%	8% < GNP <10%	GNP > 10% (over development) GNP < 0% (under development)
Deforestation rate	< 0.1% per year	0.5-1.0 % per year	> 1% per year
Forest coverage	> 30 %	15-20%	< 10 %
Agricultural development	> 0.3% ha / capita	0.15-0.2 ha / capita	0.1 ha / capita
Self-support ratio	> 91 %	60-70 %	< 50 %
Population density	< 50 / ha	100-150 / ha	> 200 / ha
Population of a city	< 0.5 million	> 1 million	> 10 million

A distinction was made between “integrated assessment” and “sustainability assessment”; which are often used interchangeably. That takes account of economic, environmental and social considerations in project decision-making.

Integrated assessment simply means, “A structured process of dealing with complex issues, using knowledge from various scientific disciplines and/or stakeholders, such that integrated insights are made available to decision-makers”.¹ Other definitions and interpretations circulate as well. The sustainability assessment is intended to become an integral component of the process of developing any strategy. It has been defined as: A systematic and iterative process undertaken during the preparation of a plan or strategy which identifies and reports on the extent to which the implementation of the plan or strategy would achieve the environmental, economic and social objectives by which sustainable development can be defined in order that the performance of the strategy and policies is improved”². Although many difficulties remain to be resolved, a number of tools and methods for integrated assessment or sustainability appraisal are available or can be adapted. Table 1-2

¹ Nolberto Munier, *Multicriteria Environmental Assessment*, ©2004 Kluwer Academic Publishers.p

² Sadler, B. (2002) From environmental assessment to sustainability appraisal, *Environmental Assessment Yearbook 2002*, Institute of Environmental Management and Assessment, Lincoln and EIA Centre, University of Manchester (pp. 145-152).

Table 1-2: tools for integrated assessment

Source: Sadler, B. (2002) From environmental assessment to sustainability appraisal. *Environmental Assessment Yearbook 2002*, Institute of Environmental Management and Assessment, Lincoln and EIA Centre, University of Manchester (pp. 145-152).

Purpose	Examples of available tools
Economic appraisal	Benefit-cost analysis, contingent valuation
Social appraisal	Social Impact Assessment, Health Impact Assessment, preference elicitation
Environmental appraisal	EIA, SEA, ecological footprint analysis
Integrative tools	Options appraisal, multi-criteria analysis, comparative risk assessment
Trade off analysis and decision-making	Stakeholder analysis, negotiation and other forms of dispute settlement
Cross-sector policy response	Macro- and micro-economic instruments, institutional and regulatory arrangements, environmental and social mitigation or flanking measures

From: Sadler (2002).

1.6.1 The link between economic development and sustainable environment

Economic development implies construction of roads, laying of oil and gas pipelines, mining of minerals, exploitation of sea resources, paving of streets, use of pesticides, increase of transportation, etc. The effects produced by these projects are:

1. The construction of roads not only consumes non-renewable resources but also produces pollution.
2. The laying of a gas and oil pipeline promotes the use of nonrenewable resources.
3. Mining the minerals alters the environment, and produces pollution.
4. The exploitation of a sea creature resource could deplete the species.
5. The paving of streets alters the natural rate for replenishment of aquifers.
6. The use of pesticides and nutrients, modifies the soil composition, and pollutes the water of the rivers.
7. The increase of transportation increments the use of non-renewable resources (fossil fuels) and contaminates a renewable resource (air) sometimes beyond its regeneration limits in a certain period of time

But on top of the damaging effect that some of these economic activities have on the environment, there are others that also challenge the sustainability of the resources. Of course, probably the best example is the consumption of a non-renewable resource such as oil and gas. There also may be use of renewable resources, For instance building a

project for a new housing development for low income people, who most likely live in a much neglected area of a city. Assume that the project has passed the economic, social and environment feasibility tests, i.e., the new undertaking is economically feasible because it offers a very reasonable and realistic plan for people to pay back the loans for their houses, and according to their income.

- From the social point of view, it will provide decent dwellings with such "luxuries" as electricity, water and sanitation.
- From the environmental standpoint, the new development will be built on an old and consolidated landfill, with proper guaranties for gas venting and burning, leaching treatment, etc. Without a doubt the environment will benefit because a garbage site will be converted in an urban area, with parks, trees, and other amenities and will eliminate a city eyesore. Water will be provided from a new battery of wells and the new settlement will be connected to the sewage network and then treated. The water wells will extract water from an aquifer which is at that time also being used to complement the water supply to the city, whose main source is a nearby river.
- From the economic point of view, everything looks fine except for a "small" detail: the rate of extraction of water when compared with the rate of replenishment is not sustainable. Alternatively, a sustainable project would extract water at a rate less than the recharging rate. So, it can be seen that there is a confrontation between economic development and sustainability, which is also to be considered in an EIA.

1.6.2 The carrying capacity of the environment

We can define this concept as the threshold of stress for the environment that can support population and ecosystems in a sustainable manner. It is necessary to add that the carrying capacity of a region can be changed for better or for worse. Usually it is related with population growth and settlement, for instance when people burn trees to make room for their dwellings.¹

¹ Nolberto Munier, Multicriteria Environmental Assessment, ©2004 Kluwer Academic Publishers.p17

1.6.3 Social, economic and environmental interaction in sustainable development

An SIA must include social, economic, and environmental aspects, but it should be clear that the "environmental" word has to be taken in its broadest context. The main problem, as easily can be seen, is how to coordinate, how to blend all the aspects contained in these three components. This is not an easy task, and besides, there is the problem of how to satisfy goals or objectives that do not have a market value such as beautiful scenery that could be ruined for a project. There is besides, another problem, that there are often different objectives and some of them contend for the scarce resources.

It is necessary to remember that if each component is represented by a circle, then the only simultaneous solution to our problem is the common space where they intersect, which vertices are: a, b and c in Fig 1.4. There is no doubt then that a system has to be found contemplating simultaneously these three aspects and considering all their interactions.

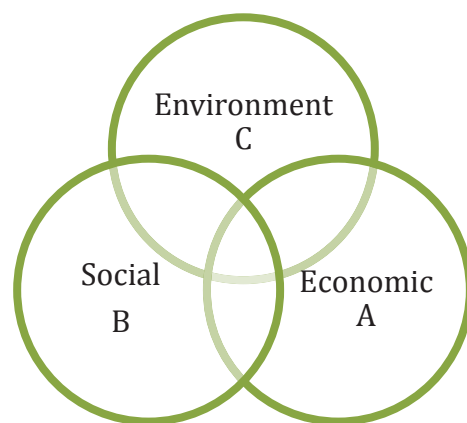


Figure 1-4. the intrsection between three sustainable areas.

1.6.4 The SIA Needs

The SIA tries to find a balance between the benefits a project brings and the damages it will produce, in other words tries to compromise between economic development and the damage to the environment. When only one project is considered, even if it is complex, the problem could be solved without difficulty. But what happens when there are several options or alternatives for the same project then it must be selected only one of them, it is necessary to analyze for each alternative the effects it produces, which can be positive, negative, direct, indirect, cumulative, able to be mitigated, etc., and then compare these effects for all the alternatives. Besides, it is necessary to take into account

the need to analyze each project from the social, economic and environmental point of view, which is the classical approach, but also considering that the sustainability issue has to be included, which is not so classical.

1.6.5 The SIA Report

A report is usually produced with all the facts concerning the project under study. From this point of view this report is a comprehensive document which must include:

- **Background information** about the project, its main characteristics, geographic location, Terms of Reference, population and ecological baselines, explaining how this information was obtained, as well as cost of each alternative. Photographs, statistics, etc, to document the statements must be added. This part of the report should also illustrate conditions, alternatives or options, explaining in detail the whole concept and purpose of the project, as well as giving the particulars regarding on what grounds the different alternatives are being proposed.
- **Identification and assessment of impacts.** Here information must be supplied concerning the procedure to identify impacts, and their assessments and significance. In circumstances where the impacts are spatially related, information has to be provided about the way they were determined. For instance, for particulate released from a stack, an explanation and results of the mathematical or other type of modeling used for pollution dispersion has to be detailed. Drawings should be provided in order to show, superimposed, the area affected by a particular kind of impact (receptor), and the area covered by the dispersion model. In such cases where impacts involve a supply chain or a path analysis, information is needed about techniques and assumptions made. The same applies to temporal impacts. Details should be given about identification of proposed mitigation measures and the degree of its restoration effects, as well as residual impacts.

Many SIA reports are rejected because some of the most important impacts have been omitted or because very weak support is given to justify the adopted values. It is important to know that impacts need to have some sort of quantitative measure in

magnitude and importance, so if particulate from the stack is considered, some cardinal values in a unit such as mg/Nm₃ should be indicated as a threshold.¹

- **Identification and assessment of mitigation measures** to be adopted, expected values of indicators after or during the execution of this mitigation procedure, and period of time it will last. Information should be given here about the procedure, that is: size and frequency of the sample, frequency of mitigation reports, instruments to be used for measurements, geographical area to be covered, etc. It could be interesting and illustrative to consider mitigation measures taken in similar projects and their results after a period of time.
- **Risk analysis** and explanation of how the main and dispersion values were obtained. Foreseeable risks should also be detailed here.
- Externalities, that is actions produced by the project which do not have a market value but that affect people and the environment.
- Compensations to be paid, if necessary, and grounds for their calculations.
- Information provided by public consultation, with a sample of the form used, size of the sample, results from surveys, etc. The method used to collect and input feedback information should be explained.
- Methodology employed for the selection of alternatives or options.

Regarding criteria, information must be given on:

- Procedure to select criteria and reasons for each one;
- Method to determine criteria significance;
- Details of how criteria are grouped, that is, environmental, social, economic, technical, etc.;
- For each type of criterion its main characteristics should be described. For instance in a road project it is necessary in the technical sub-criteria to determine: type of terrain, terrain slopes, geological stability, rivers to be crossed, arable land, etc.;
- If a weight is assigned to each criterion, it is necessary to explain how it was obtained;

¹ Nolberto Munier, Multicriteria Environmental Assessment, ©2004 Kluwer Academic Publishers.p22

- Same for determination of criteria thresholds;
- Care should be taken to avoid criteria redundancy or overlapping and explanation given about methodology and concepts used to demonstrate it.

1.6.6 The decision-making process

Once the Sustainable Assessment Report is finished and submitted to the decision-makers they should have all the elements to proceed with their judgment.

Sometimes the report is reviewed by an independent party that can make suggestions, recommendations, pointing out the aspects that are incomplete, or should be reinforced, or that are missing. Sometimes this independent panel may suggest the rejection of the report because it is incomplete or had insufficient well documented facts and findings.

The decision-makers can ask for more information or for a more complete report according to the suggestions of the reviewer. If it seems adequate, then a decision can be taken regarding the selection of the best alternative, after which it would be desirable to have feedback from the people to be affected by the project; because of this, of course, the decision could be reversed.

1.7 Conclusions

EIA is applied to the evaluation and selection of alternative forms of projects, when all significant environmental impacts are considered. The key words in this sentence are "alternatives" or "projects". Because of its scope, EIA works at project level. While SEA works at policy level, in other words, the EIA of policies, plans and programmes, keeps in mind that the process of evaluating environmental impacts at a strategic level is not necessarily the same as that at a project level.

Possible extensions of the EIA which are centered on impacts of a project on the environment are:

- Larger definition of concerned environment
- Integration of economic aspects by extension to non-use values
- Integration of social aspects (there are few examples)
- Provide long time frames by taking into account induced /combined effects

But even if these extensions point in the direction of SEA, there is a risk to overload EIA procedures, which are already often considered as too bureaucratic.

However, SEA has a different object, a larger scope and takes into account the essential parameters of sustainable development:

- Plan relevant
- Depending on political or/and planning authorities
- Relation to town/regional planning is vital
- Sustainable development aspects can be considered:
 - o Protection of (complex) resources
 - o Minimization of impacts on (extended notion) environment
 - o Long (intergenerational) time frames
- New participation procedures (stakeholders) must be imagined
- Traditional EIA steps like screening and scoping change in nature.

By discussing the role of each SEA and EIA and SIA in sustainable development it highlights the importance of knowing how SIA is applied and what are these impacts this will be mentioned in detail in the next Chapter.

Chapter2 – Sustainable Development Projects and their Impacts

- 2.1 Introduction
- 2.2 Defining the objectives of the project
- 2.3 Sustainable development Projects, alternatives
- 2.4 Identification of criteria to compare alternatives
- 2.5 Impacts caused by projects
- 2.6 Interaction between impacts
- 2.7 Evaluation of impact significance
- 2.8 Conclusions

2.1 Introduction

The primary focus of SIA is on predicting project/ sustainable relationships in terms of cause and effect. The Dictionary defines the word "effect" as "something brought about by a cause or agent: a result". For all sustainable development projects bring some degree of perturbation of the social fabric, because they involve people, induce environmental changes due to the use of nonrenewable resources, have an economic impact since monetary resources are used, or cause sustainable loss because a resource is depleted or badly affected. In other words there are always some results, positive and negative, and they need to be evaluated. The aim of SIA is to assess the impacts of a proposed development. This chapter deals with SIA rational process for alternatives or projects selection that applies to the different methods employed. This process involves the following steps:

2.2 Defining the objectives of the project

Any project must set out its objectives (economical, social and environmental). It could be that the project calls for the conservation of industrial culture heritage sites, and in this circumstance clearly the objective is to obtain some economical benefit. Sometimes it is not possible to place a commercial value on the objective; this could be the case of planning the construction of a park for recreation purposes. In this case the objective is to obtain an intangible benefit which is the construction of an amenity. On the other hand the objectives, whatever they might be, need a time framework, or in other words they have to be time-dependent. It is necessary to make a distinction between ends objectives and means objectives. Ends objectives are statements of the state of nature that is the target of the decision-making activity. Means objectives are interim goals along the path to achieving the ends objectives.¹ Ferreting out the ends objective(s) requires becoming sequentially more specific and identifying the proper endpoint for the specific decision-making group. The process involves disaggregating statements of desired states of nature until a fundamental condition is uncovered. This process must be coupled with an understanding of the boundaries of the decision-making setting.

¹ Sustainable Land Development and Restoration: Decision Consequence Analysis Publisher: Butterworth-Heinemann (February 8, 2010)p.99

2.3 Sustainable development Projects, alternatives

Very often it is possible to select amongst projects or alternatives that stand alone, but sometimes it is necessary to consider that projects can be linked with some sort of association that precludes the execution of one of them without the execution of another. It could also happen that just the opposite occurs because of the existence of exclusive projects. Besides, there are some elements that have to be considered in real life situations, such as:

- Many projects take more than a year to be completed and cash disbursement for their execution is done at regular intervals or with a certain rhythm. This sort of cash flow problem introduces some difficulties in comparing projects since not all of them have the same cost, let alone the same funds schedule. Then, it also comes to different durations. To compare projects from the economical point of view one has to take into account the year the costs and benefits occur, and then calculate the corresponding discount at the present time, as well as the especial characteristics of each project regarding such things as payback periods. There is no need to expose here the very well-known financial techniques but just mention the kind of techniques that can be utilized. For instance use can be considered of the Cost-Benefit Analysis (CBA) if the value assigned to the target is known, but if this is unknown, such as in the case of a social project involving the construction of public hospitals for instance, obviously there is no a value for this objective. In these circumstances it is possible to employ Cost-Effectiveness Analysis.¹

- Another real life factor is related with the time, speed and sequence that are inherent to each project. It is extremely unlikely that two competing projects will develop the same construction schedule that materializes in the form of the investment curve of each one (the "S" curve). For this it is necessary to take into account the bar chart or Gantt diagram for each project, and from there deduct the different degrees of completion for each main activity and for each period of time. Recognizing that in real life situations it is necessary to coordinate funds available for construction in a certain period of time with the construction schedule and its percentages for each main activity, one can understand the difficulty of the problem, and remember that this is done for each competing project.

¹ Nolberto Munier, Multicriteria Environmental Assessment, ©2004 Kluwer Academic Publishers.p114

- Last but not least, data must be obtainable considering the availability of certain resources, which normally are accessible as a pool for all projects, such as City Hall personnel of engineers, draftsmen, inspectors, etc.

2.3.1 Alternatives to a single project

An important step in defining a project is to identify, at a conceptual level, viable alternatives to the project so that a viable base-case design may be realized. In SIA it is not often that there is only one project with no alternatives to analyze. This is so because even though with a single project, it usually has different alternatives or options. Normally each alternative has a different cost, even with the same project, because everyone will have a particular route, will produce more or less pollution, will involve different works, will traverse different populated areas, etc.

The identification of alternatives and associated decisions should follow the establishment of the decision context. The decision context defines the constraints and the criteria that should dictate potential actions. The decision process is most effective when alternatives and associated decisions arise from a thorough understanding of the problem at hand. This is especially true when dealing with large scale issues of sustainability, particularly land use, energy, and transportation.

2.3.2 Inventory of alternatives or options

To achieve the objective a plan, a project, is needed. More often than not, even a single project can be broken down into different alternatives mainly considering environmental and social factors. As an example, it could be that the cheapest route for a certain project is to build it through a wetland or a populated area. Although the most convenient, economical and shortest way, probably is unacceptable because of the disruption it will cause in the natural area, problems or even risks to the population, etc, so other routes or alternatives are devised, most likely at a higher cost, but with less impact to the environment and to people. These comments are aimed to indicate that there could be several alternatives or options to reach the objective(s).

In some cases and for whatever reasons some alternatives are preferred over others, so a weight is assigned to each alternative to indicate this preference, but this is not an assurance that the alternative with the highest score will be selected, since it depends of

its degree of compliance with the established criteria used for selecting alternatives. This preferred weight is called a-priori weighting.

2.4 Identification of criteria to compare alternatives

Criteria or attributes are components or considerations that can be used to compare alternatives. Values are determined for each alternative and for the whole set of criteria, one value per criterion, in a process called scoring. Then, a score, corresponding to an alternative and a criterion will reflect, in a certain scale, how well the alternative meets the objective. The complete set of scores, involving all alternatives and all criteria, is called a "performance matrix". Fig 2-1.

In the interaction between an alternative and a criterion, there is then a coefficient that evaluates the alternative with respect to the criterion. To obtain these scores different techniques can be used, but most of them rely on expert judgment or expert opinion. Different methods have been developed to get this expert opinion in an unbiased manner, since the chance of individual preferences is always present. A technique called "Delphi" ¹ has proved to be very useful in solving this problem. If this performance matrix's alternatives are in columns, and criteria depicted in rows, then, for a certain alternative or option, its corresponding column intersects all the rows, and will indicate how well this particular alternative meets the objective when all criteria are considered. Conversely, a row representing a criterion will indicate how well the objective is met for that criterion, when all alternatives are considered together.

¹ It was developed after WWII by Olaf Helmer and Norman Dalkey of the RAND Corporation. It is essentially an iterative communication system that works with *groups of experts, spatially located*, in order to get their *independent* input about certain issues and responding to a coordinator. A *questionnaire* is prepared about some specific subject and then sent by mail or email to this panel of experts whose *members are not known to each other*. The experts are allotted some time to answer the questions posed, make their evaluations and comments and send them back to the coordinator. Once the responses of one round are received they are analyzed, aggregated, and then returned to the experts. The experts work with this information and refine their estimates.

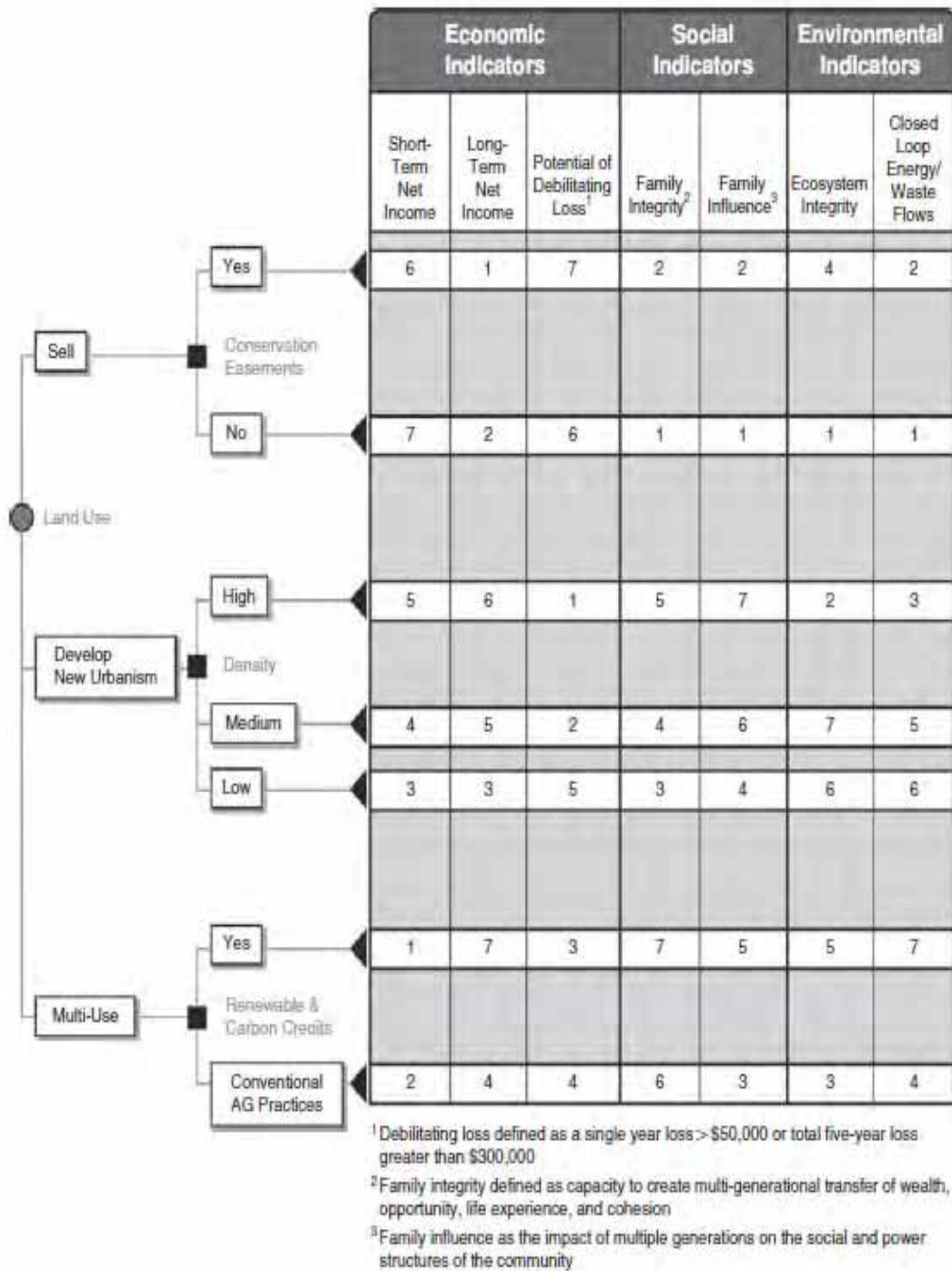


Figure 2-1 Performance matrix.
 Source: Sustainable Land Development and Restoration: Decision Consequence Analysis Publisher: Butterworth-Heinemann (February 8, 2010)p.139

2.4.1 The Baseline

It is essential to have a good inventory of the situation before the commencement of the project, in order to be able to make future comparisons between conditions after the changes and effects created by a project, and the original ones. This is called the baseline,

and it applies not only to the environment but to the population as well. As a matter of fact these changes will be measured considering the difference, in many diverse aspects, between these baseline conditions and the situation in existence after the implementation of the project. Maps, photographs, data, opinions, etc will help in establishing this baseline, and the use of GIS will be very useful for this purpose. Fig 2-2. The baseline is not constrained to learning what it is but also how it is determined. In this context an effort has to be made to understand how the ecosystem works in a particular area, how it affects other areas, and how it relates with the human population. It is important to gather information about the past history of the area to be affected by the project such as heritage sites, the existence of sacred grounds and sites according to religious or traditional beliefs, the history of periodical natural effects such as hurricanes, floods, earthquakes and tremors, etc.

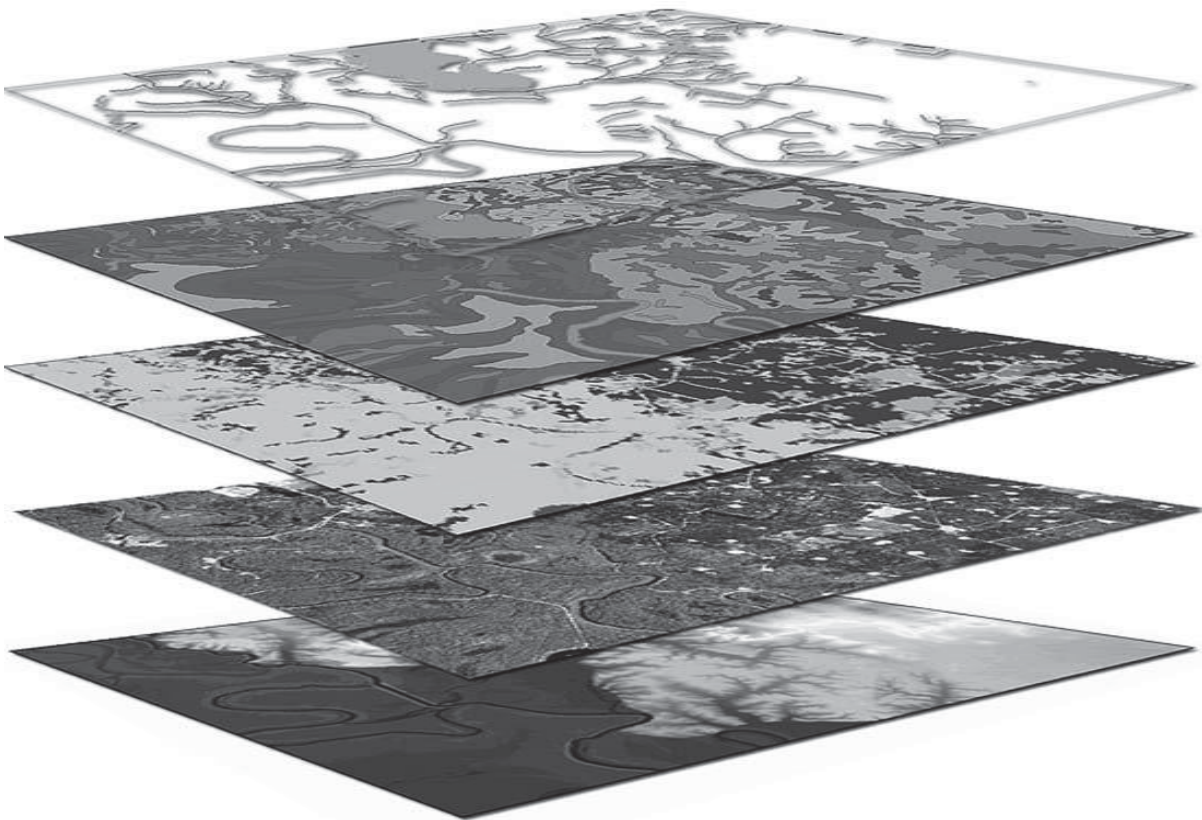


Figure 2-2 GIS data: terrain (raster—continuous), satellite imagery (raster—continuous), land cover (raster—thematic), soils (polygons), and water bodies (polygons and lines).

Source : Kandi Brown and William L. Hall. Sustainable land development, Published by Elsevier Inc2010

2.4.2 Selection of alternatives

Frequently, in simple scenarios, the performance matrix alone is used to make a selection of the most beneficial alternative. In general, the higher the score the better, therefore, if one column, i.e., a certain alternative, shows higher values in its column than any other option, most probably this is the best choice. In general, this does not happen, since an alternative can have the highest values with respect to the other alternatives for one criterion (the one with the largest value in the criterion row), but also have lower values for other criteria. One can say, well, a high value for one criterion compensates with a low value in another. Yes, it could be if all criteria had the same weight, but this is not generally the case, therefore it is not often that this type of "compensation" occurs.

The aggregation approach establishes a relative value or importance of the objectives through a multi-criteria aggregation procedure. Various inter-criteria parameters can be used to create a single numerical value that aggregates all of the performance metrics into a single numerical value attached to each alternative. These parameters may consist of weighting each of the objectives in terms of importance using scaling constants, veto or elimination criteria, aspiration levels, or rejection levels. They allow the decision maker to identify the relative importance placed on the objectives and their performance metrics. Fig2-3.

	Weight between Classes of Objectives	Weight within Classes of Objectives	Weight
Short-Term Net Income	33.0%	45.0%	14.9%
Long-Term Net Income		55.0%	18.2%
Family Integrity 2	40.0%	65.0%	26.0%
Family Integrity 3		35.0%	14.0%
Ecosystem Integrity	27.0%	40.0%	10.8%
Closed Loop Energy/Waste Flows		60.0%	16.2%
			100.0%

Figure 2-3 Example weighting scheme for aggregation of objectives

Source : Kandi Brown and William L. Hall. Sustainable land development, Published by Elsevier Inc2010

2.4.3 Public opinion

Normally the decision about the selection of one alternative or other is made by the decision-makers and stakeholders. These people act with the information provided by the performance matrix and with the results derived from applying certain techniques. However, it is a good practice to get feedback from the population who will be affected by the project. Most certainly they can contribute with information which was not considered by the stakeholders. There is a movement nowadays to consider very seriously this feedback from public opinion, coming from meetings, surveys and polls. In reality, this type of consultation has to be included as a criterion, not incorporated as feedback after a decision has been made. In this way what the people want and feel is used to gauge, together with the other criteria, how the alternatives meet the objective.¹

Before the awakening of the necessity of SIA, the selection was simpler. However, even today, in many projects, some other aspects such as public opinion or sustainability are seldom taken into account. From this point of view people's perceptions about noise to be generated in a new highway, or the uneasiness produced because the highway will separate two neighboring areas, or the aesthetic effects of the new undertaking, have to be carefully considered and studied. In other words, people's opinions are as important as the more classical issues, and must contribute to the appraisal.

It is necessary to determine what are the facts, or criteria, or components that will be used to quantify the different alternatives. This step is the first one in a project evaluation, and is called scoping. In scoping one tries to identify the key aspects of the project and establishes its terms of reference. It is also here where the decision is taken about performing or not an SIA. This decision in turn, depends on the type and size of the project.

2.5 Impacts caused by projects

Impact prediction and evaluation are the technical heart of the SIA process. A large kit of tools is available to carry out SIA work and several methods will be used in a typical impact study. An impact can be defined as "Any change to the environment, whether

¹ Nolberto Munier, *Multicriteria Environmental Assessment*, ©2004 Kluwer Academic Publishers.p.32

adverse or beneficial, wholly or partially resulting from an organization's activities, products or services."¹ An impact has magnitude, i.e., it could be large or small, and can also be important or not. As a consequence the significance of an impact is the result of these two aspects, i.e., magnitude and importance. An earthquake with a magnitude 7 on the Richter scale is serious, but if it happens in a desert area, it does not produce any damage, so its material importance is reduced. A low magnitude earthquake in a heavily populated area can be extremely important because of the damages it can cause.² There are a great variety of effects that can be caused by the proposed project or projects. They involve environmental, economic, social and sustainable aspects. A classification of impacts follows:

2.5.1 Positive or adverse

Positive effects are related with a benefit to the people or to the environment. Adverse effects relate with impacts that can deteriorate the way of life of people involved or that cause damage to the environment. Some projects generate positive effects but at the same time create new problems or adverse effects.

Many projects, like the construction of a gas pipeline between two points, might involve intruding into environmentally sensitive areas, for example bird sanctuaries, national parks, forests, wetlands, etc. This type of project produces benefits not only because it will allow a country to export its gas in this very convenient and economical way, but also by providing employment and a better living to people along the route. But there also can be secondary positive and negative effects. The possibility that the fluid could be used for heating in domestic furnaces, or in industrial plants, instead of burning oil or coal, will greatly reduce the air pollution in a city. This has happened for instance in the City of Santiago, Chile, fig 2-4 which now receives gas from a neighboring country through a gas pipeline. It also can disturb natural life or destroy hectares of forest or alter the landscape in a mountainous area because of the construction of a service road, boosting stations, and so on.

¹ ISO 14001

² Nolberto Munier, Multicriteria Environmental Assessment, ©2004 Kluwer Academic Publishers.p.34



Figure 2-4 City of Santiago, Chile

Source: <http://www.bigskyline.com/Santiago-Chile-city-skyline-pic.html>

2.5.2 Primary, secondary, tertiary.

Direct or primary effects are the immediate consequence of the project. Indirect or secondary effects are those produced by the direct effects. Many projects --- hydroelectric plants for instance --- create several positive direct effects such as encouraging economic growth by production of cheap energy for industry, and the improvement of living conditions due to the fact that electricity can now reach more households. Because of the dam in a reservoir a river discharge can be regulated stopping devastating periodic flooding, and encouraging tourism in the lake behind the dam. The water can also be used for drinking purposes as well as for irrigation, increasing the arable land. However the same project can also generate several adverse direct effects. An example is the Aswan Dam on the Nile River, because there is no longer an annual flood. As a result, the fields along the river are deprived of the very rich mud carried from far away areas, and as a consequence fertilizers need to be used. This not only creates a cost - inexistent before - but also can have adverse effects because of the introduction of nitrogen into the soil. It also produced the loss of many priceless structures -although fortunately many were salvaged -when the Nasser Lake created behind the dam, covered them.¹

¹ Human Impacts on the Nile River



Figure 2-5 The Aswan High Dam

<http://carbon.cudenver.edu/stc-link/aswan04/highdam.html>

There are also secondary adverse effects such as the disappearance of certain fish species in the Nile Estuary because the water no longer carries the rich food found in the mud for these species. In turn, there exists a third effect, for the natural habitat for birds has been altered because of the absence of fishes on which they can feed.

There are some projects that apparently could generate only benefits without any major drawback. For instance there is a solar-hydropower blueprint in Egypt for extracting water from the Mediterranean Sea and piping it to the Qattara Depression, in Central West Egypt, taking advantage of the level difference, to generate 1,800 mW. ¹

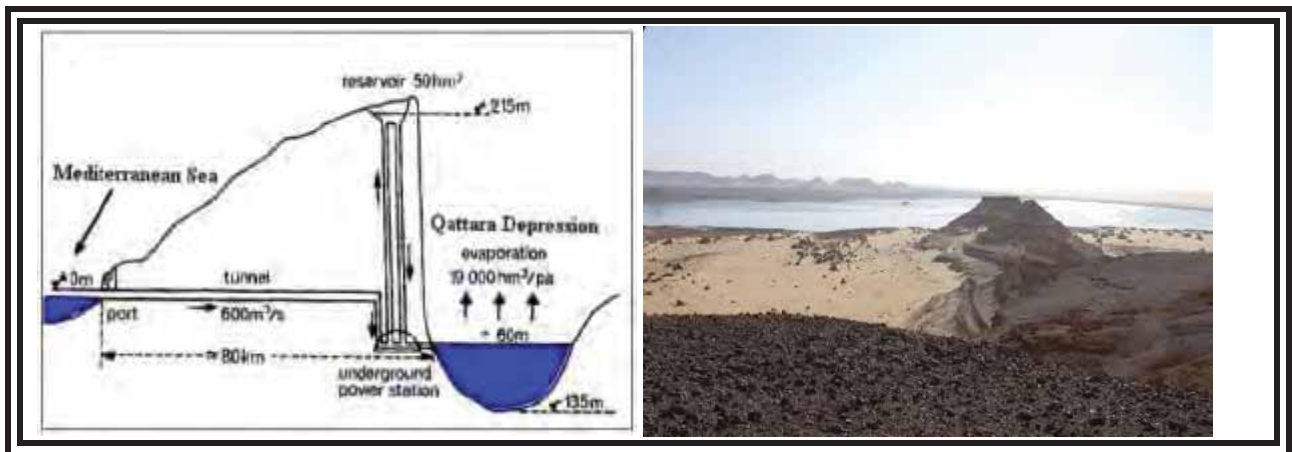


Figure 2-6 Qattara Depression

Apparently this project can only benefit the region, since it will bring electricity to a remote area; however it also creates some effects which could be adverse, as for instance:

URL:http://sitemaker.umich.edu/sec004_gp5/the_aswan_high_dam_benefits

¹ URL: <http://miktechnology.wordpress.com/2011/02/11/global-hyper-saline-power-generation-qattara-depression-potential/>

- The Qattara depression is home of a large aquifer, and it is unknown how the salt lake to be created in the Depression will alter this aquifer and the existing oasis, which are vital for the survival of many people in this area;
- As any other large reservoir, the artificial lake could induce seismic effects;
- It is also unknown how the lake will perturb wildlife in the area;
- There are some archeological sites in the area which could be lost because of the lake;
- Most certainly the intake built in the Mediterranean will produce sand drift and a high turbulence in the water. This construction might create secondary effects which could influence the fish habitat.

2.5.3 Measurable or indeterminate.

Some effects are measurable while others are not. When considering measurable effects - such as electricity generation - a value can be obtained, but sometimes this is not possible even if there is one. For instance the correlation between large masses of water behind a dam and the possible earthquakes they might trigger is not known, let alone how to put a value to its intensity. Examples of non-measurable effects are for instance the pleasure of bird watching, or the relaxation of sailing in a river, or the emotional stress produced in people when their town is swallowed by a new reservoir.

2.5.4 Apparent impacts

Sometimes the benefits are only apparent. In Cairo, highways permit the fast movement of people and merchandise. They were built to avoid delays and jams, however --- and this is a known fact --- highways feed their own growth, since more and more vehicles use them every day because of their convenience. This, sooner or later produces traffic jams, which calls for the necessity of building an additional lane or another highway, and so on, unless some measures are taken.



Figure 2-7 Cairo ring road

Source: <http://www.esforums.com/index.php?showtopic=20690>

2.5.5 Cumulative

There could also be cumulative effects of a project in a certain area. For instance something as innocent a project as the construction of a golf course, can generate small environmental effects, such as the desiccation of a lagoon, the creation of artificial dunes, the logging of some trees, the perturbation of a bird's habitat, etc.



Figure 2-8 golf city in our city

But when these effects are considered as a whole, the total impact could be significant. The appraisal of cumulative effects is not easy, because of the difficulty in delimiting or defining the geographical area where the effect takes place, that is, its spatial boundary. A classic example of spatial boundary is the area contaminated by air emission from an industrial plant. There is also a temporal boundary, since different effects can have different durations. From this point of view it is important to examine past, present and

future consequences. This cumulative issue regarding past, present and future actions is analyzed.

2.5.6 Able to be mitigated or not in a greater or lesser degree

After its execution some projects can cause worsening in the environment, for example disturbed land, construction wastes, open trenches, or cause a deterioration of the quality of life of people living nearby. An example could be the construction of a metropolitan rail transportation system (Light Rapid Transit or LRT). Train traffic can create severe discomfort and distress in houses near the tracks because of the high level of noise and vibration. Of course, some remediation or restoration work can be done, such as the construction of sound barriers, but usually there is always a residual impact that cannot be eliminated. In other cases it is quite impossible to remediate a situation, such as for instance the big excavation left after the exploitation of an open pit mine has finished.



Figure 2-9 sound barriers on 6 October bridge

2.5.7 Residual impact

Once all the mitigation measures have been applied to reduce an impact there could be a residual impact. It is necessary not only to identify this residual impact but also to evaluate it in magnitude, importance and duration, as well as measures taken to monitor its trend.

2.5.8 Spatially related

The spatial extension of an effect relates to its diffusion. For instance the Chernobyl disaster caused radioactivity to an extent hundreds of kilometers from the site of the

explosion. Projects such as the construction of big waste incinerators can contaminate the atmosphere for many kilometers from the plant. Naturally, the way contamination spreads largely depends on atmospheric factors such as winds, mountains, low or high pressure areas, etc.

There are mathematical diffusion models that can predict the extent of the contamination and determine where the particles would settle, but in many cases a health risk is also involved. For instance, mining projects and refining plants close to cities could be endangering the neighborhood not only because of air emissions, but also considering that some chemicals in the tailing ponds can reach the underground aquifers through gashes and holes in the plastic protection and contaminate them. If the city is extracting water from these aquifers, there could be very serious health consequences.

Regarding spatially related effects there are also transboundary effects. These do not always mean environmental or health damage, for they can also have economic consequences. As an example, the construction of a dam most probably will affect part of a river basin, or perhaps the whole basin, involving more than a country. A hydro-project downstream in a river can affect the maximum output of another hydro-plant built upstream, separated by hundreds of kilometers. This can be actually seen in two dams built in South America on the Paraná River. The upstream dam is the Brazilian hydrostation of Itaipú --- the largest in the world --- while the downstream dam belongs to the Argentine hydro-station of Yaciretá. Both undertakings have to be related since an increase in the level of the Argentine reservoir could affect the head of the Brazilian dam, and therefore its electrical output.



Figure 2-10 The upstream dam is the Brazilian hydrostation of Itaipú
Source:URL: <http://www.alternative-energy-concepts.com/hydroelectric-energy.html>

2.5.9 Temporal related

There are effects that are time-dependent. This is the case of emissions produced by automobiles. Over time, and depending on atmospheric variables, the effect can disappear. Some projects have to also consider for how long their effects will hold. Extensive logging could be an example. For instance how much soil erosion will take place when an area is logged, and until a new planted forest decreases the erosion rate?

2.5.10 Irreversible or reversible

Mining operations produce irreversible impacts, since we cannot restore the baseline conditions in a near or even a distant future. Some huge projects such as the construction of the pyramids in Egypt can also be considered to have produced an irreversible visual impact in the desert, and although these constructions can always be demolished to restore the visual landscape, it is very unlikely that it will happen, since then we would be altering the present day baseline by destroying a man-made cultural heritage. The loss of forests in many parts of the world to make room for agriculture, housing and roads, is

practically irreversible, for if it is true that theoretically they can be restored, in reality it is not going to happen in many, if any, cases.

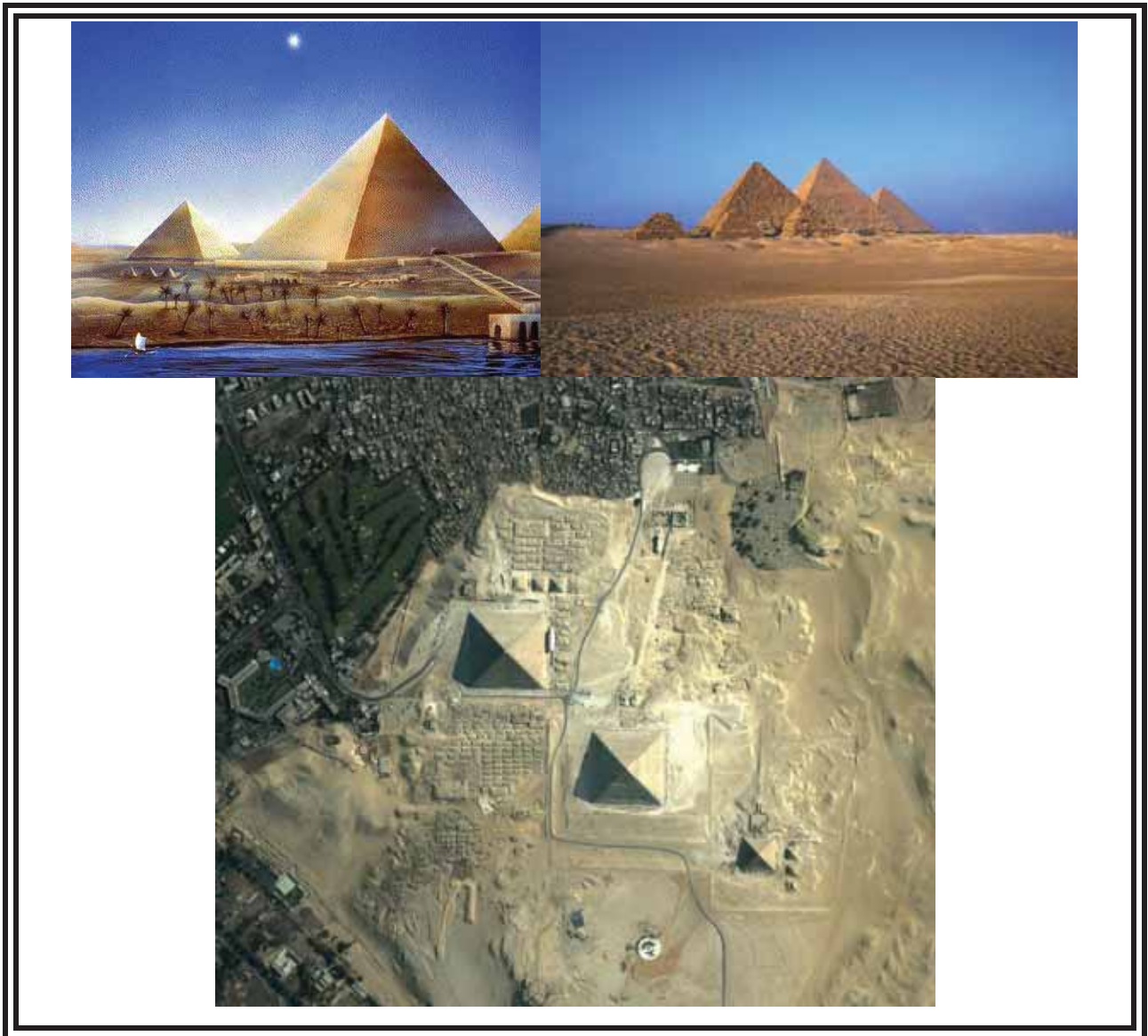


Figure 2-11 the pyramids in Egypt

Reversible impacts are those that naturally or by human intervention can be eliminated after a certain period of time. For instance if bird population in a forest diminishes because of the noise caused by a project construction, most probably this population will return in the future if the origin of the noise disappears. Another example is the cleaning of many rivers that were completely polluted and practically without fishes. After remediation works take place, there will probably be generated a fish population whose size could be close to the original one.

2.5.11 Likelihood of the impacts

In many cases one is not certain that an impact will occur. For instance what is the probability that the construction of an industrial park will have a negative impact in its neighborhood?

If the project is the construction of a highway in a residential area, for sure many people will complain because the highway will impact their easy access to other parts of the same area, or for whatever other reason. However, it could very well be that after the highway is in operation the people are happy about it because their access to downtown is now much easier and faster, a fact that was not appreciated before.

2.5.12 Unexpected impacts

Of course, nobody can predict the effects of something unexpected or whose eventual existence is ignored. Unfortunately there are many extremely serious examples of unexpected impacts. The discovery of Freon 12 (a fluid used in domestic refrigerators and in car air conditioning systems), now banned, is blamed, at least in part, for the gradual disappearance of the ozone layer. As another example, if a project calls for the construction of an off-shore oil platform, there are some unknowns such as the effect that a hurricane can have on oil spills in the sea.

Some unknown effects have been however beneficial. Take for instance Aspartame®, a sweetener that replaces sugar but only when added in cold products such as ice cream, soft drinks, etc. Its discovery was fortuitous and completely unexpected. In these cases thorough and systematic studies are needed to investigate the possible consequences of an action.

The problem with many impacts is that they could be dangerous when combined. For instance take the emission of SO₂ (sulfur dioxide) from many industrial plants and powerhouses. The gas itself when breathed has severe effects in the heart and in lungs, and can produce respiratory illness. When it is combined with water present in the atmosphere it produces sulfuric acid and acid rain. This acid rain is blamed for the acidification of water bodies and the corresponding impacts in the fish population. The problem with the unexpected is that they could be time-dependent, meaning that their

existence is not in evidence until some time has passed, and of course they also could be spatially spread.

2.5.13 Risk effects

To determine risk, a measure of the impact is usually obtained and it can be stated for instance in a sentence like "It affects one in 100,000 people". This is a measure of risk and is a mean value, and usually a standard deviation can be calculated which in essence means for instance that in 95 % of the cases there is a probability that an impact will be within the limits established by the standard deviation.

The standard deviation can be used to determine the significance between two different impacts. When their respective mean value and standard deviations are known, one can ascertain which of the two is riskier. When this mean value is imprecise or indefinite, and as a consequence limits cannot be established for the standard deviation, then there is uncertainty.

A project can also involve some risks of very different nature. As mentioned, the environmental risk of a leakage can turn an aquifer useless, but risks are not only environmental-wise; as an example consider that there could be a political risk when a pipe line is vulnerable to being cut or blown up by warring factions, as happened in August 2003 in the Iraqi pipeline transporting oil to Turkey. There is also a geological risk. Many years ago, in 1963, the Vajont Dam in Northern Italy and the biggest in Europe, broke up as a consequence of boulders falling into the reservoir, because of lack of stability.

2.5.14 Residual effects

Mitigation involves taking measures to remediate totally or at least in part the damage produced by a project. Many times the consequences of certain impact stay even after mitigation has taken place. These are called residual effects, and might be able to produce secondary impacts. The determination of the magnitude and importance of these effects is called significance. Monitoring is closely related with residual effects since one of its main features is to keep a close eye on them and make sure that they stay within the stated limits.

2.5.15 Population impact

In a preparation of a large project it is necessary to consider the impact that workers and staff will have in the society were they will be immersed.

Normally there are two kinds of situations:

- The construction site is in a desolate area in which provisions have to be taken for the accommodation of the personnel, generally in trailers. Of course, there is a need to build a sewage network as well as a sewage treatment plant. This appears to be quite excessive, however, considering that in a large project there could be a construction camp with more than 800 people, this measure makes sense.

- The construction site is near a town which can absorb the influx of workers and staff without many problems. But in some occasions there is a little town or a village whose population is perhaps a little more than the camp population. In this circumstance the problem could be very acute because even if there is camp accommodation for workers, senior personnel and staff usually lodge in town.

This impact could be important especially because of children from the senior and staff personnel attending school. It can generate problems of room overcrowding which will most probably have a negative impact in the local population, as well as an increase in prices that will have the same effect.

Another aspect to be considered as an impact, and as a negative one, is the potential for crime in town if it is situated near the camp. This is a very common problem because of the existence of hundreds of young males, staying in camp for long periods of time, with some access to alcoholic beverages and temptation to go into town.

2.6 Interaction between impacts

Sometimes impacts belonging to the same project or to different projects can interact and in so doing create a third impact. A review of alternatives to a proposed action is a basis for SIA good practice. This element is mandatory in some SIA systems and discretionary in others. It is applied primarily to find better ways to avoid and minimize adverse impacts while still realizing project objectives. Also, the consideration of alternatives can point to creative opportunities for environmental enhancement, community development

and project savings. However, review of alternatives is poorly represented or inadequately carried out in many countries. The identification of a reasonable range of alternatives begins during scoping.¹

2.6.1 Environment/project interactions

The primary focus of SIA is on predicting project/ environment relationships in terms of cause and effect. In certain cases, the environment can affect the construction or operation of a project. Where applicable, such “reverse” constraints also need to be taken into account in a SIA. They are most evident in extreme and hazard-prone areas, where climate and geophysical risks, such as floods and earthquakes, need to be factored into project engineering and contingency planning. Elsewhere, the environmental and social impacts of a project may need to be considered in terms of its operation and cost-effectiveness. For example, the construction of a dam/reservoir may involve resettlement of people and, if this is not well planned, then experience shows that those displaced often return to land near their original homes. In turn, this may result in unforeseen agricultural and other activities on the margins of the reservoir, with consequent vegetation removal, soil erosion and sediment input to the reservoir. Sediment input can shorten the operational life-span of a reservoir, adversely affecting its socio-economic objectives. In most cases, these “rebound” impacts will be minimal, but they should be addressed, as necessary, by taking a holistic perspective on environment/project interactions.

2.6.2 Social/environmental interactions

People are an integral part of the environment, and the significant social impacts of a proposal always should be analyzed as an integral part of a SIA study (or a companion report). All proposals that are subject to a SIA are likely to have social, economic or health impacts. In SIA these impacts should be predicted and evaluated either in their own right or as environmentally-related change (arrangements differ by country). Social or health impacts can be particularly important in developing countries. Often, the costs of proposed developments are imposed on local people who are dependent on the resource base for their livelihood. World Bank environmental assessment procedures give particular attention to the impact of proposed developments on indigenous peoples and

¹ UNEP, Environmental Impact Assessment and Strategic Environmental Assessment, P52

other vulnerable ethnic and cultural groups whose lifestyle, values and tenure system may be disrupted or lost. In SIA, specific consideration should be given to social, economic or health impacts that may cause further, secondary, environmental impacts. For example, a water resource development initiative caused changes in the hydrological regime of the river downstream of the project. The changes in the quality of water and the flow reduced, significantly, an area of reeds that were used by local villagers to make baskets and other articles. Selling these products provided an important source of income. Without the resource of the reeds, the villagers had to find an alternative source of income. They did so by exploiting trees that they processed into charcoal for which a market existed. By exploiting this resource they contributed to an already serious problem of deforestation and added to the attendant problems of soil depletion and erosion that accompany deforestation. This chain of events could have been foreseen if the socio-economic importance of downstream natural resources had been investigated and likely impacts predicted. It would have been possible either to protect the reeds, through controlled discharges, or to provide an alternative economic resource that could have been exploited without adding to existing environmental degradation.¹

2.7 Evaluation of impact significance

Evaluation of the significance of potential impacts takes place throughout the SIA process, beginning with screening. Also, it should be applied as a formal test of the residual impact once mitigation has been taken into account. Experience in a number of countries indicates that evaluation of impact significance is one of the more problematic areas of SIA practice. This process determines the relative importance of an impact. Ultimately, it calls for a subjective judgment to be made, which often has a major bearing on project approval and condition setting. A systematic approach should be followed, using procedure and criteria established for this purpose by the SIA system of a country or, where these measures are not in place, by reference to internationally accepted frameworks.² A review of international experience indicates that different approaches can be used to evaluate impact significance, depending on the issues and the criteria that

¹ World Bank (1991 et seq.) *Environmental Assessment Sourcebook* (3 Vols., various updates), Environment Department, World Bank, Washington DC.

² Sippe, R. (1999) Criteria and standards for assessing significant impact, in Petts, J. (ed.) *Handbook of Environmental Impact Assessment* (Volume 1), Blackwell Scientific, Oxford, UK.

apply. Generally, this process works best when easy-to-use and widely agreed scientific criteria can be used to determine significance. Examples include air and water quality standards, public health and safety standards for exposure to toxic pollutants or threats to rare and endangered species or protected areas. Where there is a high degree of uncertainty and/or controversy regarding potential impacts, a negotiation-based procedure may be more suitable to attribute significance¹. This approach usually involves technical experts but can be extended to other parties or even affected or interested stakeholders (as suggested by the World Commission on Dams, 2001).

A final determination of significance should be made only when there is reasonably complete information about the likely magnitude and characteristics of impacts. This requires first distinguishing between “as predicted” and “after-mitigation” (or residual) impacts, and then attaching a value or rating to them. Impacts are likely to be significant if they are:

- extensive over space or time;
- intensive in relation to assimilative capacity;
- above or close to environmental standards or thresholds;
- non-compliant with environmental policies, land use plans, sustainability strategy;
- likely to threaten public health or safety;
- likely to limit agriculture, wood gathering or resource uses on which people rely for subsistence;
- likely to deplete or damage resources that are commercially exploited;
- likely to affect protected or ecologically sensitive areas, rare or endangered species or heritage resources; and
- Likely to disrupt the lifestyle of large numbers of people or that of vulnerable minorities.²

¹ Hilden, M. (1997) Evaluation of the significance of environmental impacts, in *Report of the EIA Process Strengthening Workshop*, Environment Protection Agency, Canberra.

² Ashe, J. and Sadler, B. (1997) Conclusions and recommendations, in *Report of the EIA Process Strengthening Workshop*, Environment Protection Agency, Canberra

2.8 Conclusions

Every project has its own impacts these impacts are measured according to the indicators of the project which is known by better monitor progress toward a project's development objectives. One of the main challenges in assessing the impact of an intervention is extracting its influence from the other influences likely to have affected an area, such as wider economic conditions. This requires an assessment of the likely consequences of a project (which will not necessarily all be positive) and the extra benefits it will achieve compared with the likely effect if no intervention had taken place. The development Projects also need to support the use of indicators in the revised project rating system or assessment. Therefore the next chapter will deal with sustainable criteria and indicators in detail.

Chapter3 – Sustainable Criteria and Indicators

- 3.1 Introduction
- 3.2 End and Means Objectives as an Assessment Criteria
- 3.3 Criteria weight
- 3.4 Factor Analysis (FA)
- 3.5 Criteria Indicators (threshold)
- 3.6 Urban Sustainability Indicators
- 3.7 Example for the Indicators of Sustainable Community
- 3.8 Principles of Designing the Assessment Indicator System for Sustainable City
- 3.9 Issues to be considered in Establishing an Assessment Indicator System for Sustainable City
- 3.10 Conclusions

3.1 Introduction

This perspective, focusing on the sustainability of a development project while maintaining conditions for sustainable actions in the wider “environment”, is not yet a typical SIA feature. Indeed, the sustainability of development actions, especially major capital projects, is open to wide interpretation. It has been, however, increasingly an aim for development cooperation projects (such as regional economic initiatives and health promotion activities) most of which occur in developing countries or countries in transition. Basically, a proposal is assessed in relation to environmental, economic and social impacts against agreed objectives, targets or indicators. SIA fundamental ends objective has means objectives consisting of conditioning and utility objectives in other words Criteria. The criteria are those that may not be the primary concern but represent values that are intertwined with the decision setting. This Chapter discusses Sustainable objectives and criteria. As there is no procedure to determine the number and class of criteria used for the assessment process and assuming that the different criteria are linearly associated, a methodology called Factor Analysis will be discussed to minimize the number of criteria to take into account without loss of information.

3.2 End and Means Objectives as an Assessment Criteria

Criteria selection depends on many features, such as type of alternatives, areas that probably will be affected for each alternative, importance of the project, data availability, etc. So, it will probably be safe to consider as many criteria as possible to be sure that everything is covered.

Criteria can be considered as parameters used to evaluate the contribution of a project to meet the required objective.¹ The mean objective is typically part of any decision context. It is the measure of resources needed to implement an incremental improvement in the ends objective, and may also be applied as criteria. Any decision involves a commitment of resources, which is a decision to improve or ameliorate an unacceptable condition; it is simultaneously a commitment not to invest in some other need. The mean objective provides the scale against which the marginal benefit of the expenditure can be judged against the other needs. Its form also provides a method to flush out the confusions that exist when alternatives are confused with objectives. Fig 3-1

¹ Nolberto Munier, multi criteria environmental assessment Kluwer academic publishers,2004 p.46

The difference between an end objective and mean objectives is that each ends objective needs to have specific indicator. In addition, the means objectives are secondary statements of values that are desirable criteria but not in and of themselves essential components of the decision context associated with the impact indicator.

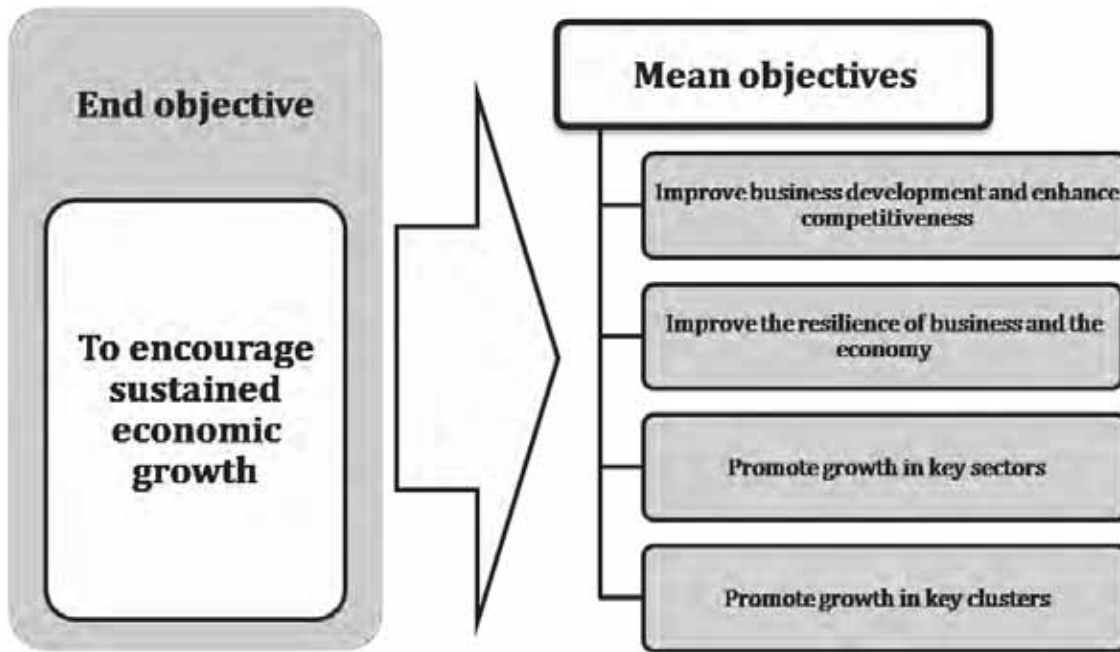


Figure 3-1 an example for mean objectives and end objective

There are some objectives that are of general use whatever the type of project, but others are more projects dependent. In this chapter a set of objectives are proposed and it is believed that they can be used in a large number of different development projects. The way to proceed is to find a relationship --- usually a cardinal number --- between each alternative, project and each criterion. This relationship establishes the contribution for each alternative, regarding the corresponding criterion, to meet the objective.¹

3.3 Criteria weight

Usually a weight is assigned to each criterion in a percentage scale. There are different ways to obtain criteria weights. Most of them utilize expert opinion that gauges the comparative importance of one criterion against the others.² This is the method used by

¹ Nolberto Munier, multi criteria environmental assessment Kluwer academic publishers,2004 p.47

² Ibid P.52

the Analytical Hierarchy Process (AHP). All these methods involve subjectivity in the determination of criteria weights, and, which is probably more important; they cannot be replicated by another set of experts. Considering several alternatives and a set of say five criteria to assess them, alternatives can be arranged in columns and criteria in rows. There is one criterion for each row, so one criterion is used to assess several alternatives. Each alternative has been assigned a coefficient which considers how well each option meets the objective regarding this particular criteria, and generally these values are normalized, being less than "1" and greater than "0". There could be a large discrepancy in these coefficients for each criterion. The greater the discrepancy the better because it means that the corresponding criterion can discriminate or differentiate between alternatives.¹ The origin of Information Theory, Shannon established a measure of the information content in a message, that he called entropy, which is a very well-known function in thermodynamics, where it measures the level of disorder.

Shannon's formula is:

$$H(\text{entropy}) = -K \sum_{i=1}^n p_i \log p_i$$

K = Constant, which depends on the choice of the unit of measure.

p_i = Probability of an event occurring.

Zeleny applied this concept but utilizing the coefficient values instead of the probabilities, and so, using this formula for each criterion, he determined which of them provides the maximum quantity of information, which is a measure of its importance of weight. There is however another method which can determine criteria weights without subjectivity. This is called Mathematical Programming and this information comes automatically when solving the problem. In this case, the values assigned to each criterion represent the imputed values to them, and also correspond to the shadow prices.²

¹ Shannon C. Mathematical Theory of Communication, the Bell System Technical Journal, 27, 379--423. in 1948

² Ibid.

3.4 Factor Analysis (FA)

Sometimes criteria are related with each other. In this circumstance it could very well be that some of them are redundant. Factor Analysis (FA) can be used to eliminate this redundancy. This is a statistical technique employed to reduce data and for discovering the underlying structure for a set of data. ¹

- Data reduction. When the criteria were chosen probably they were selected considering their importance related with the alternatives. However, not all of these criteria are independent of one another, Well, firstly the larger the number of criteria the more complicated the problem, and secondly since if they are somehow connected, then possibly one effect will be counted twice. From here it follows that it would be convenient to be certain that the different criteria are not linked between themselves. This can be done using Factor Analysis.
- The discovering of an underlying structure. In other words there is a variable called a latent variable that cannot be seen, but its existence is inferred because it is possible to observe its consequences. It was discovered some time ago that this hidden variable exists, even if it is not possible to see it, and it is called monotony, boredom, or tedium. This is the same underlying variable that originated the installation of a safety device in diesel electric locomotives; it is a pedal that has to be continuously depressed, and if the engineer falls asleep, as he relaxes, the pressure on the pedal diminishes and then an automatic mechanism stops the train.

So, these two characteristics, that is, data reduction and detecting an underlying structure characterize Factor Analysis. Where can this new concept are used in SIA. As it was said it will reduce the number of criteria to be considered and will determine the existence of the underlying structure. As a consequence, the result will show criteria as factors which are definitely not related one to another, so no double counting can occur. FA can also be used to detect these clusters of information, that is, data regarding economic conditions, another for social aspects, other for environment, and so on; in other words FA can tell how many different fields or clusters we are contemplating in our selection of criteria.

¹ Steven G. Heeringa, Brady T. West, Patricia A. Berglund, "Applied Survey Data Analysis" English | 2010

And this is important, Because then it is possible to know how balanced is the criteria selection, i.e., it allows us to know if the criteria are favoring some field, such as for instance giving more importance to environmental impacts than to social impacts

3.5 Criteria Indicators (threshold)

A threshold is a number which is used to limit or set bounds for a criterion. In this way thresholds are used as yardsticks to indicate if a project or an alternative has a significant effect. Many criteria use thresholds corresponding to indicators. For example if a criterion is related with the water consumption per capita in a city, it can be established at a value of about 255 liters/person which is the international standard. When this criterion is then used to evaluate a project contribution to reach a certain objective, this value is taken into account.¹ By the same token a threshold can also represent some measure of sustainability such as the rate of the recharge for an aquifer. This value can then indicate the carrying capacity of the environment, which are they inform on the capacity of the environment to sustain life. Examples of threshold units are detailed in Table 3-1

Table 3-1 Examples of threshold units
Source: Nolberto Munier, multi criteria environmental assessment Kluwer academic publishers,2004

Area	Units
Environment	
Urban solid waste	kg / person-day
Maximum content of CO in streets in 8 hour period	9 $\mu\text{g} / \text{m}^3$
Paper recycling	%
Particles in suspension	mg / m^3
Infrastructure	
Street flooded with heavy rain	%
Dwellings connected to drinking water	%
Traffic flow	vehicles / hour
Transportation	
Expenditure in road infrastructure	\$ / capita
Social	
Households below the poverty line	%
Total number of housing units	houses / 1000 persons
Median usable living space per person	m^2
Government	
Wages of local government staff to local expenditures	%

¹ Nolberto Munier, multi criteria environmental assessment Kluwer academic publishers,2004

Thresholds are assigned to criteria in most of the applications, and can be applied to any type of criterion. Examples are:

- Values for maximum capacity in utility plants such as water treatment and waste water treatment plants;
- Landfill capacities;
- Water, air and soil contamination indicators;
- Risk values;
- Urban indicators;
- Municipal service capacities, such as hospitals, police;

These threshold standards are then used to compare with values of impacts produced by projects and alternatives, and are also very useful in the monitoring stage. There is a good example of the use of these indicators in: Monitoring Report Technological and Environmental Management Network Ltd January 24th 2002. Dredging and reclamation programme in Kingston Harbour.¹

3.6 Urban Sustainability Indicators

The Handbook on Urban Sustainability was written by worldwide specialists from Canada, India, Italy, Palestine, Peru, Spain, and the Netherlands and is a guide to establishing a city on a sustainable path.² It addresses sustainable urban planning issues by breaking the city down to its main components. The authors analyzed and discussed these topics referring to the following indicators:

1. **Economic aspects:** Economic growth, Jobs opportunities, Unemployment, Cost of living, Taxes, Average disposable income, Ratio of household income to rental/mortgage, Increase/decrease in housing prices, Industrial diversity, Industrial resilience, Specialization, Number of centers for community participation, Emergency preparedness, and Percentage of the top five industries responsible for the 80% of income (measured in amount of wages paid per annum).

¹URL: http://www.nrca.org/publications/coastal/monitoring_rep/reports/MONITORINGREPORT4.htm

² Munier N. Handbook on urban sustainability. Dordrecht: Springer. 2007.

2. **Social aspects:** Social climate, Cultural diversity, Perceived discrimination, Social strata, Number of hospitals, Number of dispensaries, Existence of slums, Crime rate, Drug use, Child labor, Violence in schools, Number of homeless people, Housing plans for low-income people, Average ratio of teachers to students, Average ratio of students to floor space in schools, Average ratio of people to floor space in dwellings, AIDS in the city, and Quality of services in hospitals and health centers.
3. **Environmental aspects:** Reduction in energy consumption by City Hall activities, Percentage of domestic water reused, Reduction in energy consumption in the household, Percentage of industrial water reused, Reduction in energy consumption in industry, Percentage of sludge recovery from wastewater treatment plans, Tons of minerals (Phosphorous, Potassium) recovered from wastewater treatment plants, Average BOD5 content in effluent discharged by industries into the river, Percentage of plastic recycled, Percentage of paper and cardboard recycled, Percentage of tires recycled, Decrease in the use of plastic bags in supermarkets, Kg/capita of waste on the streets, Content of CO₂ in the city monitoring stations, Content of SO_x in the city monitoring stations, Square meter of green space per inhabitants, Kilometer of bikeways, and Increase in urban forests.
4. **Institutional aspects:** Ratio of City Hall personnel to 1,000 inhabitants, Advance on plans for emergency preparedness, Surveys held on urban issues, Annual number of meetings between City Hall and citizens, Percentage of measures suggested by citizens and implemented, and Percentage of the city budget managed by citizens.
5. **Infrastructure:** Percentage of households connected to municipal sewer, Percentage of households with cesspools, Percentage of crude wastewater discharged into a river, Drinking water quality, Water per capita, Average travel time, Connectivity, Number of times the city was flooded by rainfall, Landfill hectares per 1,000 people, Reduction of cars on the streets, Carpool policy, Percentage of wind energy, Percentage of biomass energy, Use of fuel-cells in transportation, and Use of stream network for domestic heating.

3.6.1 Significance of sustainable city assessment

Apart from qualitative description, the most important method used to analyze and assess the development level toward a sustainable city was quantitative analysis¹. The quantitative analysis seeks and sets up a set of measures that can quantify the development level toward a sustainable city and answer the questions that people are generally concerned about. For example:²

- What is the level and trend of sustainable city construction of this specific city?
- How can the city's ranking be defined compared with the sustainable city construction level of other cities?
- What are the weak points and key issues in the sustainable city construction processes of this specific city?
- What are the prioritized areas and paths to enhance or improve the sustainable city construction level of this specific city?

The construction or sustainable development of a city is a dynamic process with broad meanings and continuity. Measuring and assessing city's construction or development level in the sense of Sustainable City will cover many aspects including the economy, society, ecology, and environment. Therefore, it is necessary to establish an assessment indicator system, instead of one or few indicators, to analyze and assess a city's development level toward a sustainable city.

3.6.2 Assessment Indicators for Sustainable City

The assessment indicator system for a sustainable city has multiple attributes and multiple hierarchies. It is not present in one isolated set of indicators or simple collection of a set of indicators, but is present in a complex by dynamic integration of measurement indicators in many areas. This system exhibits the sustainable cities construction and development processes of assessed cities in a simple but comprehensive way, with the following six primary functions.³

¹ Sustainable Development Strategy Study Group, Chinese Academy of Sciences. 2003. China's

² Kuik O, Verbruggen, H. 1991. In search of indicators of sustainable development. Dordrecht: Kluwer Academic Publishers. 1991

³ J. Zhao, Towards Sustainable Cities in China, SpringerBriefs in Environmental Science 1, DOI 10.1007/978-1-4419-8243-8_3, # Jingzhu Zhao 2011

1. Determination of the assessment indicator system for a sustainable city: the candidate city should be systematically analyzed and identified the further determine key issues for this city to resolve. In fact, the issues judged and measured by the indicators in this system are exactly the primary focuses for the construction or development of a sustainable city, and the indicator system demonstrates the holistic development status of the candidate city through its overall effect.
2. The assessment indicator system for a sustainable city enables decision makers to focus on key issues and prioritized areas related to sustainable city development and to follow up the status and progresses of such issues.
3. The assessment indicator system for a sustainable city can instruct policy- and decision makers to know the framework for sustainable city development clearly during policy- and decision-making process and to ensure that all policies are coordinated with each other and do not deviate from the construction direction.
4. The assessment indicator system for a sustainable city can simplify and improve the understanding of sustainable city development from all the groups of society, promoting their understanding of related plans and actions and taking active measures and actions in a cooperative manner.
5. The assessment indicator system for a sustainable city can show the status and executive effect of policies on sustainable city construction development and enable people to know the development progress at any time. Feedback from the above information can help policy- and decision makers carry out early evaluation of the appropriateness and effectiveness of policies and make necessary improvements and adjustments.
6. The assessment indicator system for a sustainable city is a control tool and precautionary method used by decision makers and managers. Through time series analysis of the indicator system, city decision makers and managers can forecast and know the city's development status and future trends and carry out specific adjustments to policy control or system structure.

Table 3-2 An Assessment Indicator System for Sustainable Community in Beijing

Source: Li DH, Fang WL, Tan L, Wu J. 2003. Several key issues on urban sustainable community development building. Complex Ecology and Circular Economy – the First National Symposium on Industrial Ecology and Circular Economy Technology. (in Chinese)

First-level indicators	Second-level indicators	Third-level indicators	
Social comprehensive development level	Community population	Net immigration and emigration	
	Poverty elimination	Percentage of people under the minimum income line	
	People with disabilities	Universal design for all people	
	Education	Percentage of reeducation for community adults Enrollment radius for children of the right age	
	Culture and entertainment	Space quality for outdoor activities Variety and integrity of facilities in outdoor space	
	Medical treatment	Health service level and variety provided by community Vaccination for children under 5 years	
	Housing condition		Living area per capita and different combination of spatial functions
			Use of green building materials and energy conservation design
			Percentage of electricity use for artificial climate built
	Transportation		Different means of transportation chosen by citizens Relationship between ambulation and vehicular circulation
Community safety		Safety of walking alone in neighborhood Sound insulation and privacy assurance	
Facilitating service		Most important facilitating service citizens actually use	
Human resource		Acquaintance with neighbors	
Economic development level	Income and consumption	Engel's coefficient (the food consumption ratio)	
	Community economy self-support capability	Different financing modes for community construction	
	Community employment	Employment in the community	
Natural environment	Community landscape	Natural water condition Percentage of local species in green space	
	Environmental pollution	Proportion of nonbiodegradable housing waste from total waste	
	Sustainable use		Water use according to classification degree
			Percentage of renovation and reuse of old housing stock
Resource consumption		Mode of heating and temperature adjustment ability	
Organization and management	Community organization	Satisfaction degree for different kinds of manager	
	Property management	Property management option ascription	
	Third-party organization	Quantity of spontaneous organization and volunteers	

Table 3-3A Sustainable City Assessment Indicator System of Ji'nan, China

Source: Li F, Liu XS, Hu D, Wang RS. 2007. Evaluation method and its application for urban sustainable development. *Acta Ecologica Sinica*, 27 (11): 4793–4802. (in Chinese)

First-level indicator	Second-level indicator	Third-level indicator	
Urban-integrated sustainable development ability	Economic development	GDP per capita (Yuan)	
		Revenue per capita (Yuan)	
		Net annual income of farmers per capita (Yuan)	
		Disposable annual income of urban residents per capita (Yuan)	
		Percentage of tertiary industry in GDP (%)	
		Unit GDP energy consumption (tons of standard coal/million Yuan)	
		Unit GDP water consumption (m ³ /million Yuan)	
		Percentage of large-scale enterprises with ISO 14000 certification (%)	
		Land GDP output rate (Yuan/km ²)	
		Environmental investment ratio in GDP (%)	
	Ecological construction	Forest coverage (%)	
		Protected area in total homeland (%)	
		Recovery of degraded land (%)	
		Urban public green area per capita (m ²)	
		City life system intact rate (%)	
		Green coverage in urban built-up area (%)	
		Mining eco-environmental recovery rate (%)	
		Wetland area (%)	
		Percentage of ecological counties quantity (%)	
		Environmental protection	Air quality (better than or equal to second standard level days/year)
			Quality attainment rate for urban water function zones (%)
			SO ₂ emission intensity (kg/10 ⁴ yuan GDP)
	COD emission intensity (kg/10 ⁴ yuan GDP)		
	Quality attainment rate of centralized drinking water (%)		
	Centralized treatment rate of urban sewage (%)		
	Recycling rate of industrial water (%)		
	Attainment rate of rural sewage discharge (%)		
	Noise attainment rate (%)		
	Urban treatment rate for domestic garbage (%)		
	Social development	Comprehensive utilization rate of industrial solid waste (%)	
		Environmental quality attainment rate in tourism area (%)	
		Intensity of fertilizer application (kg/hm ²)	
		Large-scale integrated livestock and poultry breeding farm manure utilization (%)	
		Attainment rate of industrial wastewater discharge (%)	
		Level of urbanization (%)	
		Urban gas coverage rate (%)	
		Engel's coefficient (%)	
		Gini coefficient	
		Higher education enrollment rate (%)	
	Environmental publicity and education coverage rate (%)		
	Rate of public satisfaction with environment (%)		
	Years of schooling per capita (years)		
Secondary technical and higher experience per 10 ⁴ people (people)			
Average life expectancy (years)			

3.7 Example for the Indicators of Sustainable Community

3.7.1 Seattle



Figure 3-2 Seattle city

The comprehensive plan “Towards A Sustainable Seattle: A Plan for Managing Growth, 1994–2014” was adopted by the City Council in the summer of 1994, following 4 years of extensive citizen involvement as thousands of people discussed, debated, and expressed their opinions about how Seattle should grow in the years ahead. From these discussions, the following four core values emerged, which were Community, Environmental Stewardship, Economic Opportunity and Social Equity¹. Five indicator aspects were:

Environment: Wild salmon, Ecological health, Soil erosion, Air quality, Pedestrian-and bicycle-friendly streets, Open space near urban villages, and Impervious surfaces.

Population and Resources: Population, Water consumption, Solid waste generated and recycled, Pollution prevention, Local farm production, Vehicle miles traveled and fuel consumption, and Renewable and nonrenewable energy use.

Economy: Energy use per dollar of income, Employment concentration, Unemployment, Distribution of personal income, Health care expenditures, Work required for basic needs, Housing affordability, Children living in poverty, Emergency room use for non-ER purposes, and Community reinvestment.

Youth and Education: High school graduation, Ethnic diversity of teachers, Arts instruction, Volunteer involvement in schools, Juvenile crime, Youth involvement in community service, Equity in justice, and Adult literacy.

¹ Sustainable Seattle, URL: <http://www.sustainableseattle.org/About> February 2010

Health and Community: Low birth weight infants, Asthma hospitalizations for children, Voter participation, Library and community center usage, Public participation in the arts, Gardening activity, Neighborliness, and Perceived quality of life.

3.7.2 Santa Monica, USA



Figure 3-3 Santa Monica beach view

On September 20, 1994, Santa Monica's City Council adopted the city's first Sustainable City Program to ensure that Santa Monica can continue to meet its current environmental, economic, and social needs without compromising the ability of future generations to do the same. The program has evolved in 14 years since its adoption and has been responsible for many positive changes in the community. In 2003, the City Council adopted an expanded version of the program called the Sustainable City Plan (SCP), which was developed by a diverse group of community stakeholders and lays out far reaching sustainability goals for the community¹.

Resource Conservation: Decrease consumption of nonlocal, nonrenewable, nonrecyclable energy, water, materials, and fuels/Promote renewable resource use.

¹ Office of Sustainability and the Environment. Santa Monica Sustainable City Plan.
URL: http://www.smgov.net/Departments/OSE/Categories/Sustainability/Sustainable_City_Plan.aspx February 2010

Environmental and Public Health: Minimize or eliminate the use of hazardous and toxic materials and the levels of pollutants entering the air, soil, and water.

Transportation: Maximize mobility and access/Reduce traffic and pollution associated with transportation.

Economic Development: Nurture a diverse, stable local economy that supports the basic needs of community members/Increase sustainable business practices.

Open Space and Land Use: Develop and maintain a diverse open space system that supports the community and the natural environment/Create mixed-use urban villages.

Housing: Provide a mix of affordable, livable, and green housing types for people of all socioeconomic, cultural, and household groups.

Community Education and Civic Participation: Community members participate actively and effectively in civic affairs and community improvement efforts.

Human Dignity: All community members are able to meet their needs, have adequate access to housing, health care, education, employment, and are empowered to enhance the quality of their lives.

3.8 Principles of Designing the Assessment Indicator System for Sustainable City

Establishing a feasible assessment indicator system for a sustainable city should firstly define the design principles, then design the frame structure and indicator contents of this system, and finally determine concrete indicator calculation and data acquisition methods according to the determined frame structure and indicator contents. The assessment indicator system for a sustainable city is designed basically in compliance with the following principles.¹

1. The assessment indicator system for a sustainable city should cover and place equal values on economic, social, ecological, and environment areas, or it would not be an effective assessment indicator system.

¹ Sustainable Development Strategy Study Group, Chinese Academy of Sciences. China's Sustainable Development Strategy Report 2003. Beijing: Science Press. (in Chinese) 2003.

2. The assessment indicator system for a sustainable city should adequately reflect and show the denotative meanings of a sustainable city and comprehend the essence of Sustainable City in a scientific, systematic, and accurate manner.
3. The assessment indicator system for a sustainable city should be as complete as possible to reflect the primary aspects or characteristics of sustainable city development as a whole.
4. The assessment indicator system for a sustainable city should have an appropriate number of indicators, which has been compressed as far as possible for the sake of easy operation without influencing its completeness. Too many indicators may result in operation and utilization difficulties.
5. The indicators of the assessment indicator system for a sustainable city should be made unrelated to each other. In this way, the indicator system is able to maintain a clear structure and appropriate number of indicators.
6. The assessment indicator system for a sustainable city should have measurable and comparable indicators, and certain numeric methods for qualitative indicators.

In addition, the calculation methods of such indicators should be straightforward, and data for calculation should be easily accessible from reliable sources.

3.9 Issues to be considered in Establishing an Assessment Indicator System for Sustainable City

There are many issues which exist in the process of establishing an effective and feasible assessment indicator system for a sustainable city, and a key and difficult task for future work is to resolve the following issues:

3.9.1 The scientific foundation

The current level of science and technology makes us fail to understand every aspect of sustainable city development completely, accurately, and clearly. We may even fail to find some issues, meaning that some indicators were either not put forward and set up or not put forward and set up on a solid scientific foundation. Therefore, we should seek to fully

comprehend the relationship between the urban environment and socioeconomic development.

3.9.2 Computational methods

The influence of subjective factors on the selection of computational methods, such as indicator standardization, indicator weighing, and comprehensive assessment index, should be reduced as much as possible. Selection of more applicable, transparent, and accurate assessment methods can guarantee the data quality and weighing mechanism.

3.9.3 Compromise between perfection and practical demand

While it may be expected that a scientific, complete, and feasible assessment indicator system for a sustainable city can be established, in fact it is impossible to set up a complete indicator system once and for all, and we have no choice but to make certain choices or compromises between the system completeness and practical need. In other words, we could only set up a relatively feasible assessment indicator system for a sustainable city as soon as possible to satisfy the timely need, while seeking to improve the indicator system by incorporating further theoretical and practical advances.

3.9.4 An Assessment Indicator System for Sustainable City

Establishment of an assessment indicator system for a sustainable city is one of the central and critical procedures to assess a city's construction or development level in the sense of Sustainable City. The full coverage and clear structure of the indicator system directly decides the assessment effect and quality. Taking into consideration, the availability of the required data, the practical status of the current basic data for historic cities shows that it is difficult to calculate and assess the sustainable city development level from the perspectives of ecosystem services and welfare.

According to the existing situation, and taking into account heritage conditions and the availability of required data, this chapter is based on the principles of designing an assessment indicator system for historic conservation, related sustainable urban assessments within historic cities. The identified 12 indicators that constitute the assessment indicator system for Sustainable conservation are average life expectancy, proportion of educational expenditure to GDP in urban districts, GDP per capita in urban districts, urbanization rate, proportion of added value of nonagricultural industry,

treatment rate of domestic sewage, treatment rate of domestic garbage, comprehensive utilization rate of industrial solid waste, attainment rate of industrial wastewater discharge, SO₂ emissions per unit of industrial output value, dust emissions per unit of industrial output value, and percentage of green coverage in built-up area.

3.9.5 Indicator Explanations

- 1. Average life expectancy.** The average life expectancy is the average survival years of the 0-year age group, and it is a comprehensive reflection of the level of death as well as an important indicator of population health. This is an integrated indicator, reflecting both the social and economic conditions and medical progress and is also a reflection of people's nutritional status and quality of life.
- 2. Proportion of educational expenditure to GDP in municipal districts.** The proportion of educational expenditure to GDP in municipal districts is equal to the ratio of education expenditure of municipal districts to total GDP. For the sake of convenience, we referred to it as the "proportion of educational expenditure to GDP"

Proportion of educational expenditure to GDP in municipal districts

$$= \frac{\text{Education expenditure of municipal districts}}{\text{Total GDP in municipal districts}} \times 100\%.$$

- 3. GDP per capita in municipal districts.** GDP per capita in municipal districts refers to the ratio of total GDP in municipal districts to all citizens (resident population) in municipal districts.

$$\text{GDP per capita in municipal districts} = \frac{\text{Total GDP in municipal districts}}{\text{Resident population in municipal districts}}$$

- 4. Urbanization rate.** The urbanization rate is equal to the percentage of the total nonagricultural population to total population (registered population).

$$\text{Urbanization rate} = \frac{\text{Nonagricultural population}}{\text{Total registered population}} \times 100\%.$$

- 5. Proportion of added value of nonagricultural sectors.** The proportion of added value of nonagricultural sectors is equal to the ratio of nonagricultural sectors' added value (secondary and tertiary industry) to total GDP.

Proportion of added value of nonagricultural sectors

$$= \frac{\text{Second industry added value} + \text{Third industry added value}}{\text{Total GDP}} \times 100\%.$$

6. Centralized domestic sewage treatment rate. The centralized sewage treatment rate refers to the rate of urban domestic sewage emission attaining emission standards after secondary or more than secondary processing or other treatment facilities (equivalent to secondary treatment, such as oxidation pond, oxidation ditch, and biogas digester or wetland treatment system) to the total urban sewage emission.

7. Innocuous treatment rate of domestic garbage. Innocuous treatment rate of domestic garbage is the percentage of treated waste through processes such as landfill, incineration, composting, and other recycling, to the total domestic transported waste.

Innocuous treatment rate of domestic garbage

$$= \frac{\text{Treated waste through harmless process}}{\text{Total domestic transported waste}} \times 100\%.$$

8. Comprehensive utilization rate of industrial solid waste. The comprehensive utilization rate of industrial solid waste, used in the study period, is the ratio of the comprehensive utilization of industrial solid waste for main raw materials to the industrial solid waste output volume.

Comprehensive utilization rate of industrial solid waste

$$= \frac{\text{Comprehensive utilization of industrial solid waste}}{\text{Solid waste output volume}} \times 100\%.$$

9. Attainment rate of industrial wastewater discharge. The attainment rate of industrial wastewater discharge refers to the ratio of industrial wastewater volume (including treated and untreated), which fully attained national and local standards, to the total industrial wastewater discharge.

Attainment rate of industrial wastewater discharge

$$= \frac{\text{Wastewater volume up to standards}}{\text{Total industrial wastewater discharge}} \times 100\%.$$

10. SO₂ emission per unit of industrial output value. SO₂ emission per unit of industrial output value is equal to the ratio of a city's industrial SO₂ emission to

the city's industrial production value. SO₂ emission from industrial enterprises refers to the total SO₂ emitted to the atmosphere by the factory's production process and fuel combustion.

SO₂ emission per unit of industrial output value =

$$\frac{\text{Industrial SO}_2 \text{ emission}}{\text{Industrial production value}}$$

11. Soot emission per unit of industrial output value. Soot emission per unit of industrial output value is equal to the ratio of a city's soot emission to its industrial production value. Industrial soot emission refers to the amount of soot emitted into the atmosphere from enterprises.

Soot emission per unit of industrial output value =

$$\frac{\text{Industrial soot emission}}{\text{Industrial production value}}$$

12. Percentage of green coverage in built-up area. The percentage of green coverage in built-up area refers to the ratio of the vertical projection area for green trees, shrubs, and perennial herbs, managed by all units in the region to its total built-up area.

Percentage of green coverage in built-up area

$$= \frac{\text{Vertical projection area of green space}}{\text{Built-up area}} \times 100\%.$$

13. Bonus indicator. The bonus indicator refers to the awards of the National Historical and Cultural City, National Hygiene City, National Garden City, National Model City for Environmental Protection, National Civilized City, and National Ecological City. A city gains one extra point for each award.

Table 3-4 Assessment Indicators

Variable symbol	Indicator explanation	Attribute	unit
X1	Average life expectancy	Positive	Years
X2	Proportion of educational expenditure to GDP in municipal districts	Positive	%
X3	GDP per capita in municipal districts	Positive	Yuan per capita
X4	Urbanization rate	Positive	%
X5	Proportion of added value of nonagricultural sectors	Positive	%
X6	Centralized domestic sewage treatment rate	Positive	%
X7	Innocuous treatment rate of domestic garbage	Positive	%
X8	Comprehensive utilization rate of industrial solid waste	Positive	%
X9	Attainment rate of industrial wastewater discharge	Positive	%
X10	SO₂ emission per unit of industrial output value	Negative	Tons/million Yuan
X11	Soot emission per unit of industrial output value	Negative	Tons/million Yuan
X12	Percentage of green coverage in built-up area	Positive	%

Positive means the larger values represent more sustainable
 Negative means the smaller values represent more sustainable

3.10 Conclusions

The city performance is the effect and result produced by urban development activities, and the most important indicator to measure the urban development level. Sustainable city development requires the process of urban development to be comprehensively assessed and examined from a sustainability perspective. According to the implications of the connotation of sustainable cities, setting up a scientific and feasible urban development performance assessment system for measuring urban planning, development process, management, and control level is of practical significance to sustainable city construction.

Part II Cultural Heritage Development and Conservation

Chapter4: Cultural Heritage Development background

- 4.1 Introduction
- 4.2 Cultural Heritage
- 4.3 UNESCO's Definition of Tangible Cultural Heritage
- 4.4 UNESCO's Definition of Intangible Cultural Heritage
- 4.5 Loss of cultural heritage: Causes and Needs
- 4.6 Protecting and Conserving the Cultural Heritage Site
- 4.7 Cultural Significance: the first step of heritage conservation process.
- 4.8 Cultural heritage conservation needs.
- 4.9 Benefits of conservation.
- 4.10 Conclusions

4.1 Introduction

Historic urban settlements are a unique reflection of the capacity of humankind to socially structure and organize space. About 242 cities or urban settlements are registered on the UNESCO World Heritage list, representing the diverse responses to the specific geographic and socio-economic conditions by local populations.¹ Cultural dimensions, like economic dimensions, are naturally present in every human heritage and development process, not only in special “cultural development” programs. From this premise, it follows that an explicit recognition of these cultural dimensions must be incorporated into the formulation of all development policies and project interventions. This chapter deals with culture heritage expression and its division of heritage -called intangible and tangible, and the UNESCO definition for each type. Also the chapter will explore the causes and needs for culture heritage and their conservation guides and benefits.

4.2 Cultural Heritage

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage.² As part of human activity Cultural Heritage produces tangible representations of the value systems, beliefs, traditions and lifestyles. As an essential part of culture as a whole, Cultural Heritage, contains these visible and tangible traces from antiquity to the recent past. Cultural Heritage is a wide concept. We prefer to concentrate on the similarities between the various heritages sectors, instead of on their differences.

Culture and cultural heritage are prominent resources in any society. Tangible heritage may be considered a material manifestation or symbol of cultural expression, either traditions of living society or those of past societies occupying the same area. Therefore, material heritage is pivotal for anyone wanting to gain a deeper understanding of the society. This applies to the local inhabitants as well as the visitor to a new or foreign society or environment.

¹ *Historic Cities and Urban Settlements Initiative (Conservation at the Getty)* [cited 2009]. Available from http://www.getty.edu/conservation/field_projects/historic/.

² ICOMOS, International Cultural Tourism Charter. Principles And Guidelines For Managing Tourism At Places Of Cultural And Heritage Significance. *ICOMOS International Cultural Tourism Committee*. 2002.

4.2.1 Cultural Heritage types

Cultural Heritage can be distinguished in:

- Built Environment (Buildings, Townscapes, Archaeological remains)
- Natural Environment (Rural landscapes, Coasts and shorelines, Agricultural heritage)
- Artifacts (Books & Documents, Objects, Pictures)

Driving force behind all definitions of Cultural Heritage is: it is a human creation intended to inform.¹



Figure 4-1 culture heritage types:
source UNESCO

¹ John Feather, Managing the documentary heritage: issues from the present and future. In: (Gorman, G.E. and Sydney J. Shep [eds.]), *Preservation management for libraries, archives and museums*. London: Facet. 2006, pp. 1-18.

4.2.2 Tangible & Intangible Heritage

Having at one time referred exclusively to the monumental remains of cultures, cultural heritage as a concept has gradually come to include new categories. Today, we find that heritage is not only manifested through tangible forms such as artifacts, buildings or landscapes but also through intangible forms. Intangible heritage includes voices, values, traditions, oral history. Popularly this is perceived through cuisine, clothing, and forms of shelter, traditional skills and technologies, religious ceremonies, performing arts, storytelling. Today, we consider the tangible heritage inextricably bound up with the intangible heritage. In conservation projects we aim to preserve both the tangible as well as the intangible heritage.

4.2.3 Heritage Cycle

The Heritage Cycle diagram gives us an idea how we can make the past part of our future.¹ In a clockwise direction the wedges and arrows read:

- By understanding (cultural heritage)
 - people value it
- By valuing it
 - people want to care for it
- By caring for it
 - it will help people enjoy it
- From enjoying it
 - comes a thirst to understand
- By understanding it.....etc

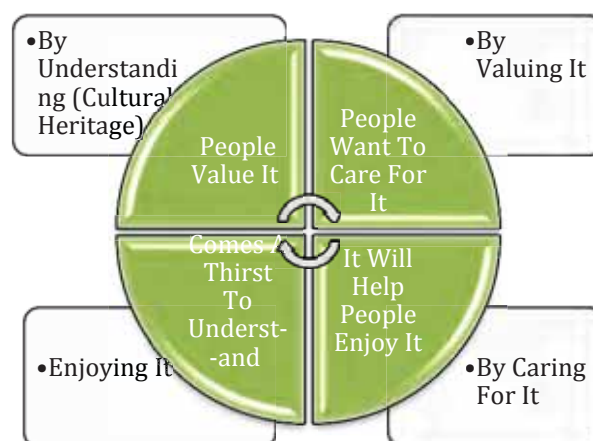


Figure 4-2 culture heritage cycle.

¹ Simon Thurley, Into the future. Our strategy for 2005-2010. In: *Conservation Bulletin* [English Heritage], 2005 (49).

4.3 UNESCO's Definition of Tangible Cultural Heritage

The key international document defining cultural heritage is the 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, which has been signed by most governments. Article 1 defines and classifies material CH under three categories:¹

4.3.1 Monuments:

Architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features which are of outstanding universal value from the point of view of history, art or science;

4.3.2 Groups of buildings:

Groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;

4.3.3 Sites:

Site related to works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding value from the historical, aesthetic, ethnological or anthropological point of view.

4.4 UNESCO's Definition of Intangible Cultural Heritage

cultural heritage' in its October 2003 Convention for the Safeguarding of the Intangible Cultural Heritage which calls for consideration to be given to such intangible cultural heritage as is compatible with existing international human rights instruments, as well as with the requirements of mutual respect among communities, groups and individuals, and of sustainable development. The definition of intangible cultural heritage in this Convention highlights:

the practices, representations, expressions, knowledge, skill - as well as the instruments, objects, artifact and cultural spaces associated therewith – that communities, group and, in some cases, individual recognize as part of their cultural heritage. This intangible

¹ URL:<http://whc.unesco.org/en/conventiontext/> march2012

cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and it provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.¹

The distinction between tangible and intangible heritage is useful for the general understanding of cultural heritage. However, in fact, tangible heritage and intangible heritage are very often closely associated and almost impossible to separate. For example, the typical Nubian village the pottery products of the village (tangible heritage), the pottery making knowledge of the local people (intangible heritage), but these two things are in the same heritage place. Fig4-3



Figure 4-3 the existence of both tangible and intangible heritage

Source: taken by Ashraf Abdel Mohsen Nuba city

According to the meaning and types of the culture mentioned above, it can be concluded that culture is an invaluable heritage which shows the prosperous civilization of any communities or societies. This heritage has been passed down from generations to generations for a long period of time. Therefore, cultural heritage is worth being preserved for the future generations.

4.5 Loss of cultural heritage: Causes and Needs

Cultural heritage resources throughout the world especially in the developing countries and tourist destination countries are in constant danger from both natural and human-

¹ URL:<http://whc.unesco.org/en/conventiontext/> march2012

made threats. The nature causes of threats can range from natural disasters, such as earthquakes, floods, typhoons, humidity, insects, natural decay, and tidal wave. For human-made causes of threats consist as follows:

4.5.1 Damages of heritage assets

It is true that the loss of material heritage is not a novel occurrence. What is new is that recent economic circumstances combine dangerously with natural causes to increase the magnitude and speed of this destruction, with irreparable consequences for present and future generations. The material heritage is a perishable public good, and states and nations have a compelling responsibility for preserving it.¹

National governments in MENA countries, civil societies, and UNESCO and the international community have repeatedly sounded the alarm bell about this deteriorating situation. Because the “development perspective” advocates a role for the patrimony as a resource for development, it is incumbent upon it to also address the formidable problems of stemming the loss of patrimony. Fig4-4.



Figure 4-4 El Darb El Ahmar with its many bazaars and old neighborhoods, famous for their latticed woodwork and original architecture, but many are in need of restoration.

¹ Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001p.21

4.5.2 Causes of Heritage loss.

The major risks, losses, and constraints in MENA countries that currently endanger CH preservation indicate that four clusters of causes are at work:¹

4.5.2.1 Natural causes.

Although natural causes of deterioration have long been recognized, protection lags far behind today's level of knowledge about possible preventive action. Natural disasters such as earthquakes, floods, major storms, and landslides, as well as regular natural processes— time itself and its merciless effects, rainfall, wind, and temperature changes—all slowly sap the resilience of ancient physical monuments or buildings, increase their vulnerability, and then destroy them during dramatic events. A characteristic of the built heritage of MENA countries is its concentration in coastal areas along the Mediterranean shores fig 4-5.

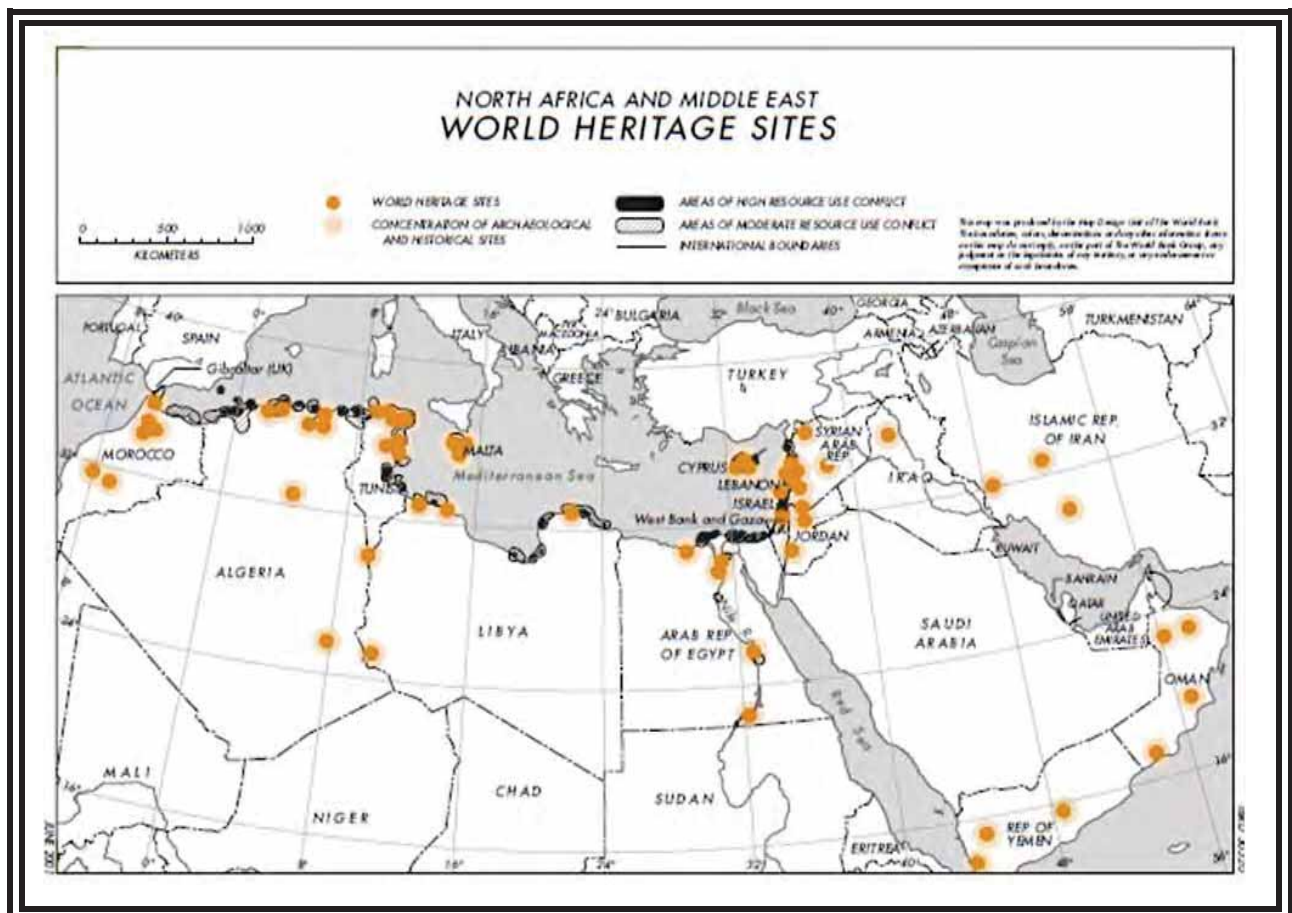


Figure 4-5 UNESCO map for MENA countries

¹ Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001p.22

Their geographic location implies constant exposure to high humidity and coastal erosion. In turn, the erosion may be partly natural and partly caused by human action, through intensive coastal zone development. In addition, tall buildings and minarets are highly vulnerable to seismic events¹. A considerable part of the built heritage of MENA countries has been devastated by disastrous earthquakes over the centuries.² Poor husbandry of the domestic water supply and, often, the absence of drainage combine to increase humidity and decay and to accelerate the crumbling of historic buildings.

Earthquake Disasters and the Built Heritage Irreparable losses have been inflicted throughout the centuries to the cultural patrimony in MENA countries by earthquakes, floods, and other natural calamities. Risk of further damage from earthquakes requires preventive reinforcement of the most endangered historic buildings and monuments to help them withstand future calamities.

- *Agadir*, Morocco's historic western port on the Atlantic Ocean, was devastated in 1960 by two consecutive earthquakes; about 15,000 people died. Rebuilding of the city began shortly thereafter, but most of its monuments cannot be reconstructed. Large parts of the historic city were leveled, and the cultural site is lost.

¹ Crocci, Giorgio. Studies on Seismic Vulnerability of Minarets in Cairo and Criteria for Improving Their Safety. Universita degli Studi di Roma., 1997.

² Abouseif, D. B. 1994. "Reconnaissance Report of Damages to Historic Monuments in Egypt, following the 1992 Dashour Earthquake." State University of New York, Buffalo.



Figure 4-6 Earthquake in Agadir, Morocco, 1960 (photo taken 9 July 1960)
Source: <http://www.flickr.com/photos/10822554@N02/2321106204>

- **Algeria's major urban center, Orleansville** (renamed El-Asnam and then Chleff), which had been affected by earthquakes in 1905, 1922, and 1928, was destroyed in 1954 and again in 1980 by major earthquakes. Many unprotected historic and religious buildings have been lost, particularly during the last two earthquakes.



Figure 4-7
http://www.everyculture.com/images/ctc_03_img0637.jpg

- **Beirut** and its famous law school were destroyed by the big earthquake of the sixth century C.E., which also badly damaged Baalbek's monumental temples.



Figure 4-8

<http://www.maclester.edu/courses/geog261/efarhat/%20beirut/history.htm>

- **In Egypt**, more than 30 earthquakes were registered between 796 and 1500 C.E. In 1847 a single earthquake destroyed 42 mosques in El Fayoum. In the 1992 Dahshour earthquake, the buildings most affected were schools, Coptic churches, and the Coptic Museum in old Cairo. In Cairo itself, 140 monuments were severely damaged, and—without preventive reinforcement— many remain today in danger of collapse.¹



Figure 4-9

Source: http://geogtakesovertheworld.blogspot.com/2010_02_01_archive.html

4.5.2.2 *Economic causes.*

Compounding adverse natural conditions, economic growth itself unleashes a set of economic causes of deterioration of the heritage.

¹ Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001p.23 Source: *Natural Hazards* (1994), 10: 261–74.

- Infrastructure construction can lead to extensive losses during the building of highways, roads, railways and airports, hydropower dams and reservoirs, new towns and industrial estates, and mines. Infrastructure required for urban expansion accounts for major losses in Cairo, Carthage, Sana'a, and many other old cities.
- Economic and technological changes have gradually pushed out many traditional crafts and wares from old medinas and souks, modifying production patterns, rendering old warehouses obsolete, and depriving historic cities of much of their technical, economic, and commercial basis. The cities and souks of Zabid and Old Shibam in Yemen, both on the World Heritage List, are eloquent examples of what are today dying monuments.
- Agricultural expansion, together with the expansion of irrigation systems and competition for land, results in encroachment on sites with important archaeological remains.
- Air pollution has emerged over recent decades as one of the gravest threats to old built structures. Industrialization has led to increased emissions of corrosive acidic pollutants such as sulfur oxides¹.

4.5.2.3 *Social causes.*

Among the social causes of accelerated deterioration, the most typical are described below.

- **Population densities have increased**, mostly in urban settlements (e.g., in medinas of cultural value), accelerating the wear and tear on historic buildings. Demographic growth generates large amounts of solid and liquid waste, decreases maintenance, and triggers illegal construction and illegal demolition of the built heritage. High levels of rural-urban migration continue to increase densities in towns and coastal areas. For example, demographic projections indicate that Mediterranean coastal populations will grow from 82 million in 1990 to 150 million— 170 million in 2025, sharpening competition for land and increasing pollution, among other effects.²

¹ Mourato, Susana. 1997. "Effects of Air Pollution on Cultural Heritage: A Survey of Economic Valuation Studies." Report prepared for the UN Economic Commission for Europe. Centre for Social and Economic Research on the Global Environment (CSERGE), University College London. Processed.

² Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001p.24

- **Tourism**, which is intended to celebrate the historic heritage and may contribute to saving it, can have destructive effects when it is commercialized beyond normal carrying capacities, bringing pollution, waste, and sometimes vandalism.
- **Looting**, illegal excavations, and theft from archaeological sites, repositories, and museums are among the most vicious forms of heritage destruction. “Grave robbers” are an old breed of enemies of the heritage, but experts warn that the pace and scale of looting have greatly accelerated as a result of the use of modern techniques (such as explosives and powerful metal detectors that reveal caches of bronze, silver, and gold) and because of the “incentives” provided by unscrupulous dealers and by instant publicity about prices at international art auctions. By definition, most such destruction through looting goes unreported. When civil wars and political upheavals occur, controls break down completely, and vast areas become looting fields. The destruction of heritage art in the last four decades represents a cultural disaster probably unmatched at any time in history, which has accelerated in the last ten years.¹
- **Neglect and ignorance**. Last, but not least, lack of awareness of what is irreplaceable heritage and why it must be preserved also causes much loss. Millions of people actually live in or use buildings that are part of the cultural heritage, without being aware of it or of the sensitivity of the buildings to particular conditions. Fig5 The result can be unwitting damage to the heritage.²

¹ Melikian, Souren. 1997. “The Destruction of Art and History in Iran and Afghanistan.” Paper presented at the Symposium on the Anthropology of Cultural Heritages, School of American Research, Santa Fe, N. Mex.

² Amahan, Ali. 1999. Héritage cultural; au Maroc Study commissioned by the World Bank. Rabat, Processed.

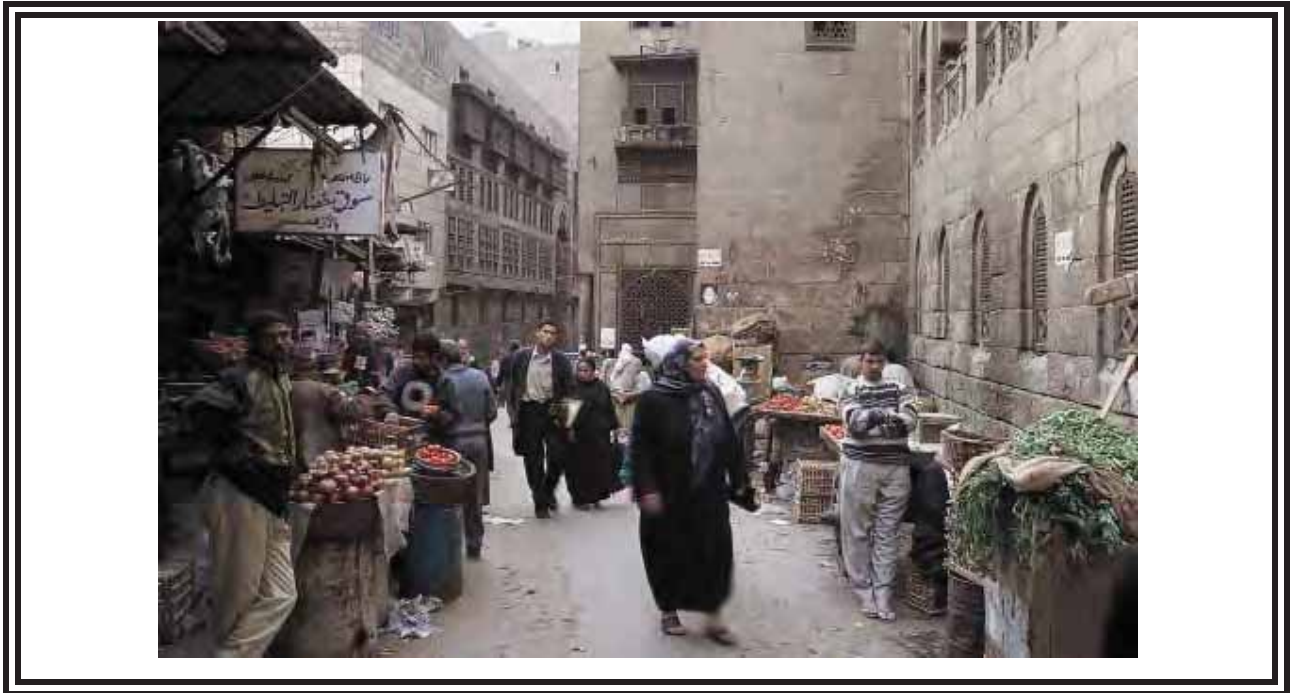


Figure #4-10 The Tablita market in the heart of the historic center Cairo.

4.6 Protecting and Conserving the Cultural Heritage Site

The general process of protecting a heritage site is called conservation. The conservation means all the process of looking after a place so as to retain its cultural significance¹. The main aim of conservation is to protect the elements that reveal heritage values of a cultural site from the various kinds of threats it faces over time especially human-made threats. Additionally, understanding the heritage values of a cultural site leads to an understanding of the heritage importance of a site. This is called “Cultural significance”. Understanding cultural significance is an important first step before planning and making any conservation and management of a heritage place.

Conservation is the technique for treatment of damage and deterioration to a site and its setting. Treatment includes the following four categories: regular maintenance: physical protecting and strengthening; minor restoration: and major restoration.² Conservation involvement can be of various types and are classified according to levels of involvement. Level of involvement correspond to the amount of change introduced to a heritage site - the more change, the higher the level of involvement. The choice of conservation

¹ (Burra Charter, Australia ICOMOS, 1999).

² China Principles, China ICOMOS, 2002

involvement for a site is governed by the conservation policies established through the process. These following are commonly-used terms for conservation involvement:¹

- Preservation means maintaining the fabric of a place in its existing state and retarding deterioration.
- Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material
- Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric.
- Adaptation means modifying a place to suit the existing use or a proposed use.

However, for protecting of intangible heritage is much more complex than the protecting of tangible heritage. Very often, intangible heritage is associated with tangible objects and places. For example, tradition way of life, festivals and other special events, etc., therefore, must go beyond physical measures and address all the factors that may have an impact on intangible heritage.

4.7 Cultural Significance: the first step of heritage conservation process.

In the development of heritage conservation internationally has been recognized that an essential step in the conservation process is to identify clearly what the significance is - that, both the level of significances (world, regional, national, and local) and the type of significance (what are the 'heritage values' that need to be protected). In many countries in the world there have been many attempts to develop processes or methods of cultural heritage significance assessment. For example, at the international level, the UNESCO World Heritage Committee has developed its Operational Guidelines². While various national, regional and local governments have developed their own approaches. Another international level organization, The International Council on Monuments and Sites (ICOMOS) acts as advisor on cultural heritage matters to the World Heritage Committee. Several of the national committees of ICOMOS have also drawn up professional guidelines

¹ Australia ICOMOS Burra Charter, 1999

² UNESCO latest revision 2005

for heritage conservation. The Australian national committee of ICOMOS, known as Australia ICOMOS, is an example. For the heritage conservation of ICOMOS focus on developing a rigorous process for identifying and managing places of cultural significance, which it defines in the following way:

Cultural significance is a concept or method which helps in the assessment of the value of the places. The places that are likely to be of significance are those which facilitate an understanding of the past or enrich the present, and which will be of value to future generations.¹

In the Burra Charter cultural significance means: "aesthetic, historic, scientific or social value for past, present or future generations".² Cultural significance is embodied in the place itself; its fabric, setting, use, associations, meanings, records, related places and related objects. Place may have a range of values for different individuals or groups. Cultural significance is a concept or criteria for assessing which helps in estimating the value of place or site which is including area, land, landscape, building or other work, group of building or other work, and many include components, spaces and views. The place that are likely to be of significance are those which help an understanding of the past or enrich the present and which will be of value to future generation.³

4.8 Cultural heritage conservation needs.

The needs of the cultural heritage conservation can be:⁴

- Linking urban and tourism investment projects with direct support for heritage preservation.
- Safeguarding Threatened heritage in ways that incorporate them into development strategies and yield economic and social benefits.
- Expanding the institutional capacity for managing these national resources.

¹ Australia ICOMOS, 1979; revised 1999. The Burra Charter, Guidelines to the Burra Charter for the establishment of cultural significance.

² URL: <http://www.marquis-kyle.com.au/bcsignificance.htm>

³ Australia ICOMOS URL: <http://australia.icomos.org/publications/charters/>

⁴Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001p.3

4.9 Benefits of conservation.

The most essential benefit of conserving the past is to render the present in a familiar way. Tracing the ground in minds makes sense of the present. Without habit and the memory of past experience, no sight or sound would mean anything; man can only perceive what he is accustomed to. It can be suggested that the benefits of conservation in a general sense might include the five points discussed below.

4.9.1 The social benefits

There are significant benefits to the social, psychological and political well-being of individuals, groups and nations – or indeed collections of nations. The concept is that the physical evidence of the past holds meaning for individuals and/or groups. ‘The capacity of a site to convey, embody or stimulate a relation or a reaction to the past is part of the fundamental nature and meaning of heritage objects.’ In part, this is related to relatively intangible concepts such as the idea of a collective memory and the sense that the physical remains of the past can embody and represent and stimulate this. The argument is that the ability to connect to the past is important because it, amongst other things, ‘gives existence, meaning, purpose and value’¹ Fig 4-11

¹ Derek Worthing, Stephen Bond, "Managing Built Heritage"Wiley-Blackwell | 2008-p.49

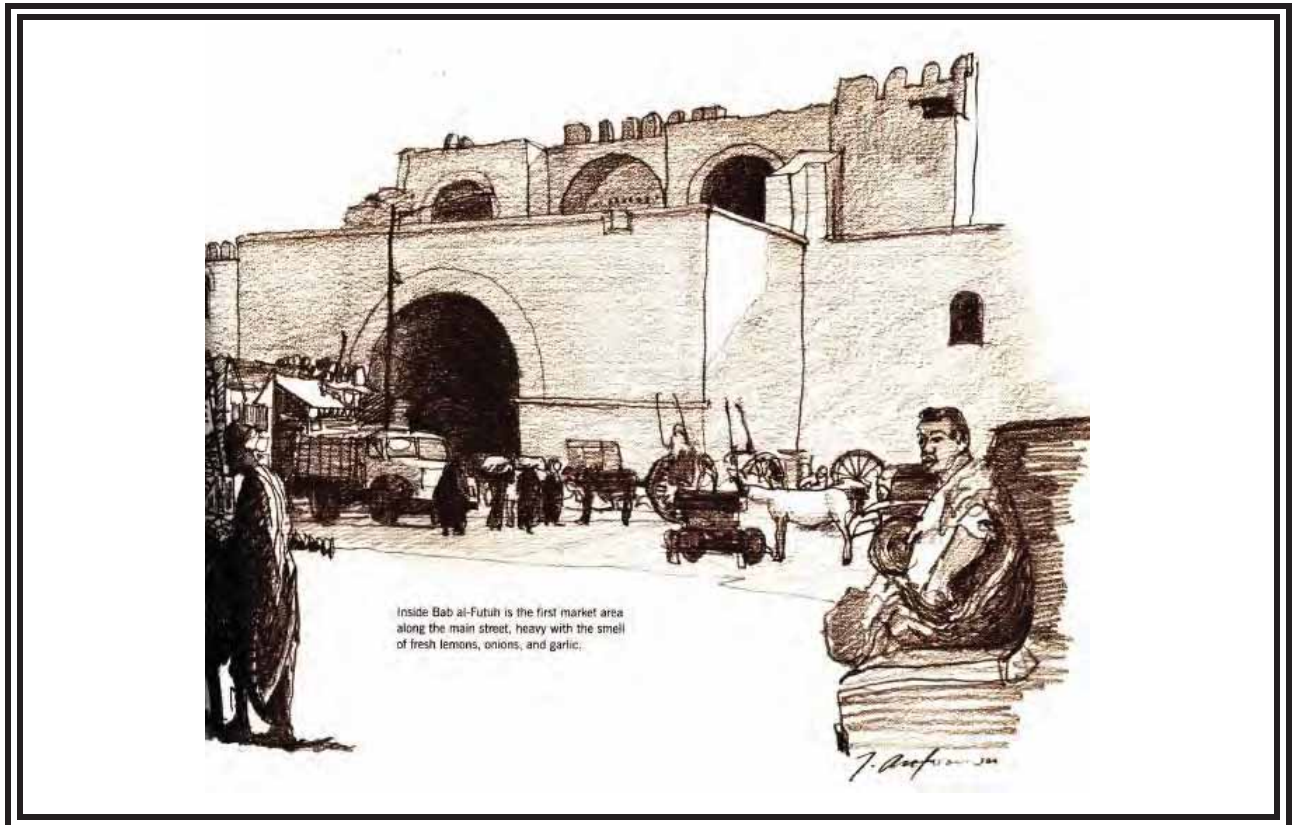


Figure 4-11 inside Bab al-Futuh is the first market area along the main street, heavy with the smell of fresh lemons, onions, and garlic.

Source: HISTORIC CAIRO: A Walk through the Islamic City p41

This might work at a national level with often symbolic values being at play the role of the restoration, or in many cases re-creation, of iconic buildings or structures following war or other disasters is an obvious example. But it can of course happen at a smaller group level, where a building can symbolically represent the development and or values of particular factions and therefore play a positive role in reinforcing and acknowledging shared values and reinforcing notions of community identity. However, it can have the opposite effect, and polarize and exclude by reinforcing and validating a particular view of the past. Cultural heritage can be a beneficial and benign tool in the search for peace, international stability, communication amongst and the forging of linkages between peoples, the sharing of common values, and respect for cultural diversity.

4.9.2 Educational benefits

There are significant educational benefits – that we can understand aspects of past societies not only through analysis of the physical remains of the past but also the historic environment is a focus and an opportunity for a less ‘expert’ engagement with the lives and experiences of previous generations. In the same way that we suggest that the buildings we construct today reflect the values of modern society, those from the past

can help us to understand the political, social, economic and cultural values of previous societies.

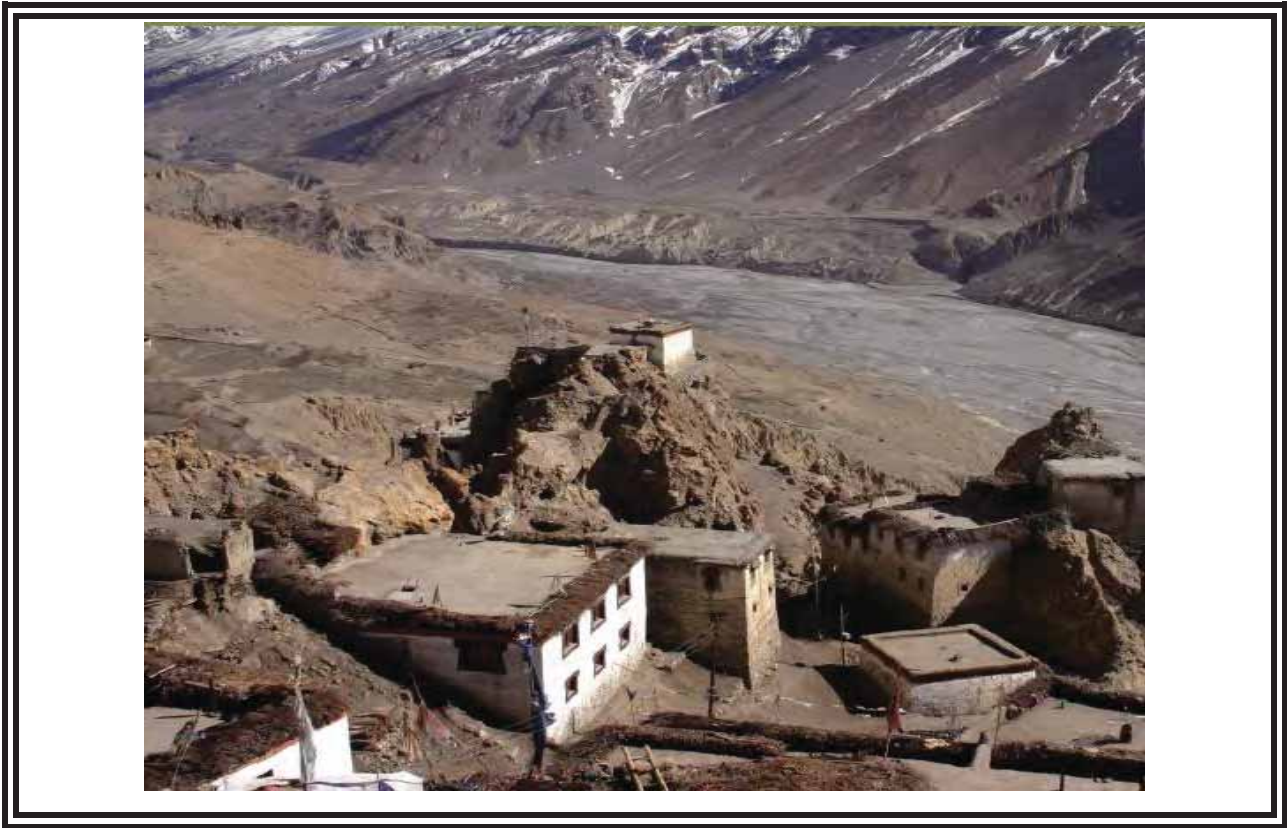


Figure 4-12 The earthen structures of Dhangkar Gomba, a Buddhist monastery in the western Himalayas, have survived for nearly a thousand years but are under threat from inappropriate interventions, seismic vibrations, and a changing climate. Photo: c Marek Kalmus, 2005.

The historic environment is an incomparable source of information. For people in the distant past and for more recent generations whose history was never recorded it offers the only route towards an understanding of who they were and how they lived.

4.9.3 Environmental and financial benefits

The existing buildings are resource that should be reused for environmental and financial sustainability reasons.



Figure #4-13

The original capital city of Bahrain. Besides the evident buildings and open spaces of the souq, the ensemble is in an area long considered a cradle of societal transformation and political events in Bahrain's history. Exposed to the elements, neglect, and inappropriate building additions and development, the souq has deteriorated. In 2005, a preliminary study was conducted to assess the souq in order to address these issues.

4.9.4 Visual aesthetic benefits

That the historic environment contributes to a sense of place through its character and its visual aesthetic. In many cases the built cultural heritage is a strong defining force or anchor for a sense of place (*genus loci*) that can be identified and appreciated by inhabitants and visitors. For some, the extent and intensity of such identification may be determined by the knowledge and understanding of the place that the person or group has, particularly in relation to factors such as present and previous uses and/or the nature and meaning of events which may have taken place there. The place may be important as the repository of a cultural memory that reinforces group identity.



Figure 4-14 Hamm Am Turkish Baths, Tetovo, Macedonia. U.S. Embassy Skopje

That historic buildings and areas attract significant tourist revenue and make significant contributions to local, regional and sometimes national economies and employment. The various benefits can also be in tension. The obvious one being that of maximizing the financial aspects at the expense of the social ones, particularly perhaps at tourist sites where the physical fabric and the 'spirit of the place' may be damaged by a mass influx of people and the service provision that is thought necessary to support them (and maximize income). Concerns about the impact of tourists at such well known tourist sites as Florence, Venice, Machu Picchu and Angkor Wat are echoed in various other cultural hotspots and also mirror concerns expressed about, say, national parks and other aspects of the natural environment.

4.10 Conclusions

People have always had the need to refer to their history in order to ensure the continuity of a common identity that evolves over time. Heritage is a collective property which tells the history of a people, a city, or a territory, and is transmitted from one generation to the next. Heritage makes it possible for the present generations to understand their place in history and to better cope with the constant mutations in society: it is an element of stability in a rapidly changing world.

Heritage is also an essential element that makes it possible for a people to show its uniqueness, to manifest its own way of perceiving the world and to express its capacity for cultural creativity. The culture of a community is an original creation, which manifests itself in every dimension of life – the everyday activities and the periodic events, involving the use of ordinary objects as well as the most sophisticated productions.

To take action in favors of heritage is a necessary step for the perpetuation of the cultural elements that are necessary to the existence of a society. Sometimes, this also makes it possible to find solutions to a number of problems and difficult situations that a community and its members encounter. To preserve the heritage is for a community to work towards the recovery of a collective memory and identity, and through this collective effort, create social cohesion.

This results finally in the maintenance of social harmony, which implies the recognition and respect for the differences in the cultural identity of each community, a determining factor in the implementation of a sustainable development policy. In a context of development, it is clearly evident that projects, including those that prove technically accurate, that do not take into account aspects of the local cultural identity, knowledge and know-how, have little chance of succeeding. On the other hand, heritage has today become a powerful instrument in the economic and territorial development of a community, when properly promoted, often in the context of tourism related activities.

Chapter5: World Heritage Convention

- 5.1 Introduction
- 5.2 The UNESCO World Heritage Convention
- 5.3 World Heritage List
- 5.4 List of World Heritage in Danger
- 5.5 Conclusions

5.1 Introduction

The Convention is the bedrock document of World Heritage Sites, and so this chapter is devoted to an examination of it and how it works. The site administrator may or may not have a role in the process of nominating a site to the World Heritage List. Nevertheless, it is important that the site manager have a basic knowledge of the legal relationship of national, state (provincial) and local governments to the World Heritage Convention. These legal relationships to a large extent govern how a particular level of government can influence or control tourism at World Heritage sites.

5.2 The UNESCO World Heritage Convention

The World Heritage Convention was adopted by the General Conference of the UNESCO on November 16, 1972.¹ It established a World Heritage List that identifies cultural and natural heritage sites of “outstanding universal value.”² The Convention’s purpose is to identify and help protect worldwide sites of such exceptional ecological, scientific, or cultural importance that their preservation is a global responsibility. The Convention also created a List of World Heritage in Danger, which is composed of sites on the World Heritage List that face significant natural or man-made risk and dangers. A site must be on the World Heritage List to be considered for inclusion on the Danger List.

Countries that are party to the Convention agree to protect listed sites and monuments within their borders and refrain from actions that might harm such sites in other countries. The Convention recognizes the sovereignty of individual countries, stating that the responsibility for protecting and conserving World Heritage sites belongs primarily to the country where the site is located.³ States Parties to the Convention (hereinafter referred to as “parties”) agree to help provide such protection through the World Heritage Committee and Fund.

¹ UNESCO is one of the specialized agencies of the U.N. system. It is an autonomous intergovernmental organization with its own constitution, separate budget, and program. It is affiliated with the United Nations through an agreement signed in 1946. UNESCO’s purpose is to contribute to peace and security by promoting collaboration among member states in the fields of education, science, and culture

² World Heritage Convention, at <http://whc.unesco.org/en/conventiontext/>.

³ Article 6 of the Convention states that while “fully respecting the sovereignty of the States” on whose territory the cultural and natural sites are found and “without prejudice to property right provided by national legislation [sic],” the parties to the Convention recognize that the sites constitute “a world heritage for whose protection, it is the duty of the international community as a whole to cooperate.” Article 4 notes that each party to the Convention “recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage ... situated on its territory, belongs primarily to that State.”

5.2.1 World Heritage Committee

The World Heritage Committee, which is comprised of 21 members elected by the parties to the Convention for six-year terms, oversees implementation of the World Heritage Convention.¹ Its primary responsibility is selecting the sites nominated by parties to be included on the World Heritage List. The Committee also monitors the sites and may make recommendations to improve the management of a site or place a site on the Danger List. In extreme circumstances, it can remove a property from the World Heritage List if it determines that a country is not fulfilling its obligations to protect and preserve the site. Committee decisions are made by a two-thirds majority of Committee members present and voting. Generally, however, Committee decisions are made by consensus—particularly those that add sites to the World Heritage List or Danger List.²

The Committee has three intergovernmental and non-governmental advisory bodies to provide advice during its deliberations. They include (1) the International Union for Conservation of Nature (IUCN); (2) the International Council on Monuments and Sites (ICOMOS); and (3) the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM).³ Some Committee members have advocated improving the Committee's operations under an ever-growing work load by focusing on monitoring conditions at existing sites rather than adding new sites. Nevertheless, new sites are added regularly.⁴ The UNESCO World Heritage Centre is the Convention Secretariat, and plays no role in decisions of the Committee.⁵ Current members of the Committee are Australia, Bahrain, Barbados, Brazil, Cambodia, China, Egypt, Estonia, Ethiopia, France, Iraq, Jordan, Mali, Mexico, Nigeria, Russia, South Africa, Sweden, Switzerland, Thailand, and the United Arab Emirates.

5.2.2 World Heritage Fund

The World Heritage Committee administers the World Heritage Fund, which provides technical and financial assistance to countries requesting it. Such assistance can include

¹ Luisa Blanchfield Specialist in International Relations July 20, 2011

² Article 13(8), World Heritage Convention.

³ The World Heritage Committee's advisory bodies, URL: <http://whc.unesco.org/en/advisorybodies/>.

⁴ In 2005, the Committee added 25 new sites; in 2006, 18 sites; in 2007, 22 sites; in 2008, 27 sites; in 2009, 13 sites; in 2010, 21 sites; and in 2011, 25 sites.

⁵ The Centre is the focal point and coordinator within UNESCO for all matters related to the World Heritage Convention. For more information, URL: <http://whc.unesco.org/en/134>.

the provision of experts, technicians, skilled labor, equipment, and training, as well as emergency assistance. World Heritage technical assistance must be requested by a member country in an agreement with the Committee, which sets conditions for assistance. The majority of the Fund's income comes from required member country contributions amounting to about 1% of that member's UNESCO dues. The Fund also receives voluntary contributions from governments, foundations, individuals, and national and international promotional activities. Total funding is usually about \$4 million each year. In recent years, requests have largely exceeded available funds, and the Committee has had to allocate funds according to the urgency of the request with priority given to the most threatened properties.

5.2.3 National and International Protection

Member countries recognize that it is primarily their own responsibility to safeguard World Heritage properties in their countries. They agree to do all they can with their own resources and with international assistance. This includes agreement to:

- Adopt a general policy giving cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programs.
- Set up services for the protection, conservation and interpretation of that heritage.
- Develop research studies and operating methods of counteracting dangers that threaten that heritage.
- Take appropriate legal, scientific technical, administrative and financial measures to preserve and present that heritage.
- Foster national or regional centers for training and research in the fields of conservation and interpretation.

It is the duty of the international community as a whole to cooperate in protecting world heritage; therefore member countries agree to help when other countries ask for assistance in identifying, protecting and conserving their sites of outstanding universal value. Also each country agrees not to take deliberate measures that might directly or indirectly damage World Heritage properties in another country.

5.3 World Heritage List

The World Heritage Committee determines which sites are to be inscribed on the World Heritage List and monitors the state of conservation of those already on it.

The Committee is served by the World Heritage Centre as secretariat and by three technical advisory bodies: for cultural sites, the International Council on Monuments and Sites (ICOMOS) and the International Centre for Conservation in Rome (ICCROM); for natural sites, the World Conservation Union (or International Union for the Conservation of Nature and Natural Resources (IUCN), the same organization that maintains the *Red List of Threatened Species*).



Figure 5-1 Florence, Italy. The early entries on to the World Heritage List showed a strong bias in favors of European sites. The historic centre of Florence, symbol of the Italian Renaissance, was inscribed as a World Heritage Site in 1982.

In April 2006 there were 182 state parties to the *Convention*, and in July 2006 the World Heritage List comprised a total of 830 sites in 138 countries. Of the 830 sites, 644 were classified as cultural, 162 natural and 24 mixed.¹The World Heritage List is necessarily selective and subject to reflection over time. Analysis of the list of cultural heritage sites

¹ Dennis Rodwell Conservation and Sustainability in Historic Cities, Publisher: Wiley-Blackwell edition 2007.p67

inscribed in the first two decades of the operation of the *Convention* discloses a strong bias in favors of ones that coincide with the roots of architectural conservation, namely, European, Christian, and monumental (Figure 4.2). Since 1994, an evolving global strategy has sought to achieve a more balanced list, including by geo-cultural distribution, by under-represented categories of sites, and between cultural and natural sites. This process of reflection has necessarily involved the examination of a number of precepts, including the interpretation of *heritage* in different contexts.

5.3.1 Adding Sites to the List

In order for a site to be added to the World Heritage List, parties must complete a nomination document that identifies and describes the site, provides justification for its addition to the list, and highlights conservation and other factors affecting the site. The Convention's advisory bodies evaluate whether a site meets the criteria for the list and make recommendations to the Committee. The recommendations fall into three categories:

- 1) properties (sites) that are recommended for inscription without reservation,
- 2) properties that are not recommended for inscription, and
- 3) nominations that are recommended for referral or deferral.

To be selected, sites must meet one or more of a set of criteria demonstrating "outstanding universal value." Sites meeting such criteria might be a masterpiece of human creative genius; represent an outstanding example of a type of building, architecture or technological ensemble, or landscape that illustrates significant stages in human history; or contain superlative natural phenomena or areas of exceptional beauty. The Committee also takes into consideration the integrity and/or authenticity of the site and adequate site protection and management.¹ (See **Appendix A** for the full list of criteria for outstanding universal value.) The Committee considers the recommendations of the advisory bodies and decides whether a site should be inscribed on the World Heritage List. The Committee may refer a proposed site back to the party for additional information or defer the nomination until additional in-depth study or assessment is completed or the party submits a substantial revision.

¹ Appendix A

5.3.2 Removing Sites from the List

The Committee may delete a property from the World Heritage List if it determines that the property has deteriorated to the extent that it has lost the characteristics that led to its inclusion on the list. It may also be removed from the list if the Committee determines that the party did not take the measures necessary to protect the site from threats and dangers within the agreed-to time frame. If these conditions apply, the party on whose territory the site is situated is required to inform the World Heritage Convention Secretariat. Other parties may also inform the Secretariat if they believe a site should be deleted from the list. In such cases, the Secretariat will verify the source and contents of the information and consult with the concerned party. Once a site has been recommended for deletion by a party, the Secretariat will invite the relevant advisory bodies to comment on the information received. The Committee will then consider all the available information, and can vote to remove a site from the list by a two-thirds majority of members present and voting. A site cannot be removed from the list unless the concerned party has been consulted. Since the Convention was established, only two sites have been deleted from the World Heritage List. In 2007, the Arabian Oryx Sanctuary in Oman was delisted after the size of the sanctuary was reduced by 90%. In June 2009, the Dresden Elbe Valley in Germany was delisted because a four-lane bridge was built in the middle of the site. Both countries concurred with the removals.

5.4 List of World Heritage in Danger

Sites on the World Heritage List that are considered to be seriously endangered may be placed on the Danger List. These are sites that are in particular danger for which “major operations are necessary and ... assistance has been requested...”¹ Two-thirds of Committee members present and voting are required to add or remove a site from the Danger List, though generally such decisions are made by consensus.

5.4.1 Adding Sites to the Danger List

The World Heritage Committee is responsible for adding and removing sites to the Danger List. The Committee may add sites to the Danger List when it determines that the property is threatened by serious and specific danger, major operations are necessary for

¹ Article 11(4), World Heritage Convention.

the conservation of the property, and assistance under the Convention has been requested for the property. Article 11(4) of the Convention states that sites “threatened by serious and specific dangers” should be placed on the list. Examples of such dangers include the threat of disappearance caused by accelerated deterioration; large-scale public or private projects or rapid urban or tourist development projects; destruction caused by changes in the use or ownership of the land; major alterations due to unknown causes; the outbreak or the threat of an armed conflict; and serious fires, earthquakes, landslides, volcanic eruptions; and other similar circumstances.¹ The criteria for determining whether a site should be placed on the Danger List are divided into two types of danger: “ascertained dangers” that are permanent and proven dangers, and “potential dangers” that could have “deleterious effects on its [the site’s] inherent characteristics.”² The criteria for cultural sites and natural sites are different. Cultural sites under consideration for the Danger List must meet at least one of several ascertained or potential danger criteria, including serious deterioration of materials; significant loss of historical authenticity; lack of conservation policy; outbreak of threat or armed conflict; and gradual changes due to geological, climatic, or other environmental factors.³ Natural sites under consideration must meet at least one of ascertained or potential danger criteria, which include (1) a serious decline in the population of the species of outstanding universal value for which the property was legally established to protect, (2) human encroachment on boundaries or in upstream areas which threaten the integrity of the property, or (3) planned resettlement or development projects within the property or so situated that the impacts threaten the property.⁵⁵ When considering a site for the Danger List, the Committee should consult with the concerned party to develop a program of corrective measures that includes analysis of the present condition of the site, threats to the property, and the feasibility of implementing corrective measures. In some instances, the Committee will send a group of observers and/or advisors from its advisory bodies to visit the site, evaluate the nature of the threats, and propose recommendations. Upon receiving and considering all relevant information, the Committee determines whether the site should be added to the Danger List. Once a site is added, the Committee will define the program of corrective action to be undertaken.

¹ AppendixB

² “Operational Guidelines for the Implementation of the World Heritage Convention,” pp. 47-49.

³ Ibid

Some parties maintain that the consent of the relevant party must be attained before a site may be placed on the Danger List. In the past, the United States has both supported and opposed this point of view.

5.4.2 Removing Sites from the Danger List

Generally, sites are removed from the Danger List because the World Heritage Committee feels that the conditions of the site have improved to the point where the site is no longer in imminent danger.

However, the Committee may also remove a property from the Danger List when it determines (1) “the property has deteriorated to the extent that it has lost those characteristics which determined its inclusion in the World Heritage List” and (2) “the intrinsic qualities of a World Heritage site were already threatened at the time of its nomination by action of man and where the necessary corrective measures as outlined by the party at the time, have not been taken within the time proposed.”¹ To date, no site has been removed from the Danger List for these reasons. If such a removal were to occur, however, the party on whose property the site is located would inform the Convention Secretariat if (1) the site has seriously deteriorated or (2) the necessary corrective measures have not been taken within the time proposed. Other parties and organizations may also recommend a site be removed from the list. In these cases, the Secretariat will determine the validity and source of the information and consult with the concerned party. The Secretariat forwards all relevant information to the Committee advisory bodies, which make recommendations to the Committee. The Committee then votes on whether a site should be removed from the Danger List.

5.4.3 The Middle East and North Africa sites

The countries of the Middle East and North Africa are blessed with an extraordinary cultural heritage, secular and religious, of huge importance for each country and for humankind at large. The region is home to 48 sites already inscribed on the World Heritage List² maintained by the UNESCO and has an enormous nonmaterial heritage as

¹ Ibid

² According to UNESCO’s operational guidelines for the WHL, a site nominated for the list may be one that is a “masterpiece of human creative genius” or “bears a unique . . . testimony to a cultural tradition” or is “an outstanding example” that illustrates a significant stage or significant stages in human history.

well. The Middle East is also the cradle of the world's major monotheistic religions. This cultural heritage is a cornerstone of many people's existence and nourishes their daily lives. It must continue to flourish. The presence of such valuable endowments in the entire region's countries opens up a major development opportunity: the cultural heritage can become a pillar of the region's overall growth-enhancing strategy, as well as a rich foundation for people's education. It can evolve into a source of robust employment, contributing to the reduction of poverty and unemployment. Laudable steps along the lines of this strategy have been taken. Yet much more needs to be done, and exponentially more can be achieved in this domain, for the overall benefit of the region and the world at large. The treasures of MENA's cultural heritage, although rich and seemingly inexhaustible, nonetheless suffer from accelerated deterioration and depletion. Many natural, economic, and social processes combine perversely to erode its riches. The cultural heritage therefore needs increased support for preservation and better management. Development assistance cannot be oblivious to both these opportunities and needs.

5.5 Conclusions

Regardless of the way in which the internal government of the particular country is organized, the national government will have to, in some way, because of its obligations under the World Heritage Convention, assume those powers to insure the site's protection or in some other way insure that convention requirements are met.

What this means in simple terms is that the country's national government has a two-fold responsibility:

- (1) That of insuring that the World Heritage Convention is complied with (this obligation cannot be delegated to another level of government)
- (2) That of insuring that the actions necessary to comply with the Convention are fulfilled. This responsibility can be delegated although the national government will remain ultimately responsible to the Convention.

These requirements must be met before a site can be considered for listing by the World Heritage Committee. They are as important as compliance with one or more of the criteria for listing. The failure of any one of those two that would result in the loss of

outstanding universal value as required by the convention will, in theory, allow the World Heritage Committee to consider and, if thought appropriate, remove a property from the List.

Chapter6- Cultural Heritage Conservation in Egypt

- 6.1 Introduction
- 6.2 The effect of Geography on Egyptian Nationalism
- 6.3 Egyptian Cultural Heritage Conservation
- 6.4 Al-Azhar Park1
- 6.5 Restoration of the Ayyubid Wall
- 6.6 Neighbouring District of Darb al-Ahmar
- 6.7 Siwa Oasis
- 6.8 ESNA City Developments
- 6.9 Conclusions about the Role and Importance of Egyptian Historic Environment

6.1 Introduction

Egyptian heritage is distinguished by its unique composition as a result of the interaction and integration of numerous historical layers (in reference to when they were built), and spatial layers (in reference to their association with other historical buildings from various periods). This cross-sectional view of Egyptian urban heritage is not limited to specific architectural models, or separate spaces, nor is it restricted to specific historical layers. It can be applied to what may termed “collective heritage”, including all spatial and interactive relationships of historical buildings (buildings, sites, complexes, etc). This Chapter attempts to explain the Egyptian personality in MENA then introduces the cultural heritage conservation efforts in Egypt and analyzes some of these cases studies which cover the different heritage sites in Egypt. In which sustainable objectives for culture heritage projects will be concluded.

6.2 The effect of Geography on Egyptian Nationalism

The geography of Egypt has a regional personality as a MENA country must concerns the personality of Egyptian people essentially in the study of Egypt as a country or a region. The reason is that geography is the science of things, not the science of humans. The subject of the personality of human beings as a group in any location is deeply connected with the idea of ‘national peculiarities and this idea of [national] peculiarities. “Geography is, in the dominant trends in contemporary schools, ‘aerial differentiation’; that is, the perception of major differences in parts and levels of the earth. Therefore it is natural that the summit of geography is the perception of regional personality. This regional personality transcends a mere mathematical amalgamation of characteristics and the distribution of regions; that is, it exceeds a mere body of regions itself. It defines what characterizes an area and differentiates it from other areas. It is an attempt to approach ‘genius loci’ to clarify ‘its own ingenuity’ that define its hidden personality”¹. Throughout one of the description of the regional personality of Egypt, a pair of key concepts was used: “site” and “situation” The general theory we use to interpret this regional personality is based on interaction - be it harmonious or contradictory - of two essential sides of its existence. Site means an environment and its characteristics, its size, and its resources; that is, the Nile environment with its unique nature, the shape of valley, its

¹ Gamal Hamdan, The Personality of Egypt (Shakhsīya Misr) Third Edition volume I 1984- p.11

form and its composition. As for situation, it is a comparative characteristic that is decided in relation to the distribution of land, population and production in our region and is regulated by spatial connections attaching it. Site is a local, inner, tangible specialty, but situation is an invisible geometrical idea"¹ Egypt's situation forced the nation to bear the burden of playing a leading role in national liberation movements in the Arab world and the African continent, but these burdens sometimes exceeded her power and the resources restricted by her site. Fig 6-1



Figure 6-1 Political Map of Northern Africa and the Middle East.

Source: <http://www.nationsonline.org/one-world/map/north-africa-map.htm>

The most major characteristics of the personality of Egypt as follows:²

1. Natural, material, civilization, and human homogeneity
2. Natural and political unity
3. From civilization precedence to backwardness
4. From colonialism to colony
5. From Pharaonic tyranny to socialist revolution
6. Outer natural basis of structure of civilization
7. Centralism in spite of expansion
8. Overcrowding without immigration
9. Plurality of dimensions
10. Medium and equilibrium
11. Continuity and discontinuity
12. Duality of nationalism: Egyptian Nationalism and Arab Nationalism.

¹ Gamal Hamdan, The Personality of Egypt (Shakhsiya Misr) Third Edition volume 1984 I p.35

² Ibid p.47

In order to grasp the spirit of the place and the hidden genius of country, we must move from particularization to generalization, from the parts to the total, from the “regions of Egypt” to “the region of Egypt”¹. The political unity in Egypt as homeland, nation claims that the correct combination of natural unity and national unity contributes to the formation of political unity². Natural unity depends on the interaction between;(1) site and (2) situation. National unity is composed of (1) ethnic, (2) religious, (3) linguistic, and (4) psychological unities. In the latter “quartet,” the combination of religious unity and linguistic unity leads to “cultural unity”.³

6.2.1 Natural Unity

While small rivers frequently provided the basis of one single political unit, big rivers sometimes created many states conflicting with each other. But the Nile valley historically has brought unity into the political homeland of Egypt.⁴ The natural basis of this political unity was brought “from outside” its situation in relation to the outer world and “from inside” its site on the basis of the Nile valley. The clearest feature of the situation of Egypt is its solitude from the outer world, intercepted by the deserts. Consequently Egypt has kept unified throughout its long history as a “quasi-oasis” or an “island or a quasi-island in the ocean of deserts.” Both the Eastern Deserts and the Western Deserts have been natural dividers, but it is significant that both have their own backgrounds, the Red Sea and the Libyan Desert, and also share a similar landscape sloping toward the center.



Figure 6-2 the Egyptian deserts

¹ Gamal Hamdan, *The Personality of Egypt (Shakhsīya Misr)* Third Edition volume 1984 I bid p.49

² Gamal Hamdan, *The Personality of Egypt (Shakhsīya Misr)* Third Edition volume II 1984- p.507

³ Ibid p.507-508

⁴ Ibid p.458

All of these elements provide a strong force toward the center, that is, the Nile valley. Egypt has been just an island surrounded by deserts and seas from ancient times.¹ The second condition of the site produces both structural unity and functional unity. Structural unity means that the Nile in Egypt, marked off by both the cataracts and the Mediterranean Sea, has formed racial and ethnic geographical borders. The Nile differs in this point from other big rivers, which mostly become political borders dividing countries. The second type of unity, functional unity, is nothing but the function of an irrigation system based on the Nile, in which the “chain of basins” formed an integration of irrigation units in the country. In addition, the Nile contributed to functional unity through the development of water transportation.²



Figure 6-3 Different Views for the Nile in Egypt

6.2.2 National Unity

The argument of national unity, its first dimension ethnic unity in particular, is also closely related to the subject of human homogeneity. This homogeneity is not exclusive because Egypt is a kingdom of absorption which has entry but no exodus. A remarkable point in the argument of cultural unity is that “the duality of Muslims and Copts in Egypt neither contradicts national unity, nor religious unity. That is because the Coptic minority is the heart of the solid Egyptian body.”³

¹ Gamal Hamdan, *The Personality of Egypt (Shakhsiya Misr)* Third Edition volume II 1984 p.460

² *Ibid* p.464-465

³ *Ibid* p.525

The last dimension of national unity, psychological unity, is closely related to the uniqueness of the Egyptian environment. This uniqueness is distinguished by the historical role of nomads as an outside enemy to the inhabitants of the Nile valley in pre-modern periods. Indeed the medieval history of Egypt is characterized by dual tones: the periodical inundation of the Nile and Bedouin invasions.¹ In modern times, foreign invasions of the Western powers contributed to psychological (political) unity of Egypt.

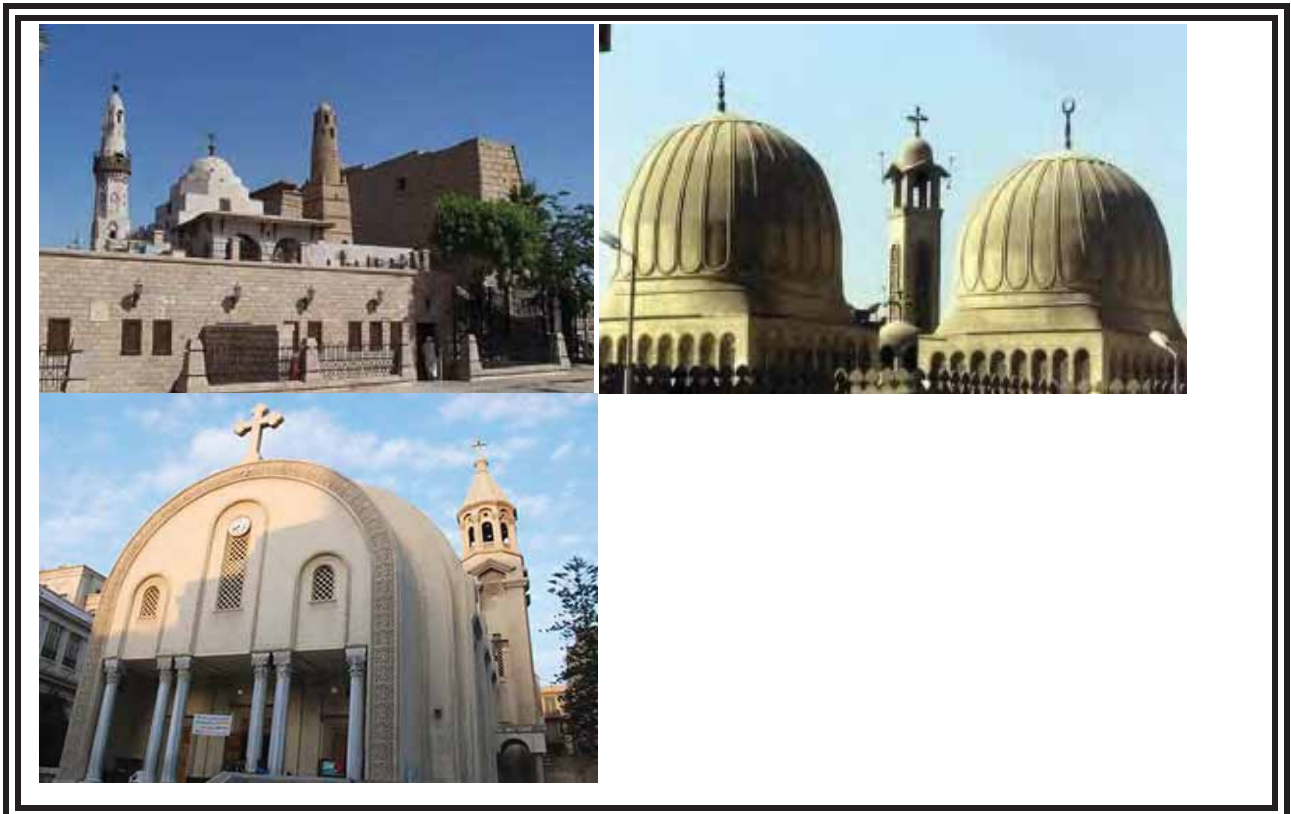


Figure 6-4 the unity between churches and mosques in different places in Egypt

6.3 Egyptian Cultural Heritage Conservation

A great deal of the activity within cultural heritage conservation has been concerned with maintaining single buildings of architectural significance and connected with important events and people. Various actors have been involved in this process, including non-governmental organizations, all levels of government, and developers. Concerns with the limitations of identifying and protecting single buildings have led to laws and regulations that protect entire environments. This allowed the process to involve more people in

¹Gamal Hamdan, The Personality of Egypt (Shakhsiya Misr) Third Edition volume II -p.530

heritage conservation, and it defined a past that included the ordinary as well as the most significant. Many countries maintain heritage sites for interpretation and education; these are often characterized by high levels of research and documentation, as well as government management. Steadily increasing demand for culture-oriented activities affects cultural heritage of interest at all levels, from world heritage belonging to international society or mankind in general to heritage of national, regional and local significance. Conservation issues and challenges vary accordingly. In many developing countries, the legal framework for protecting heritage is better than the management capacity. Surveying and monitoring systems for controlling the state of conservation of cultural heritage and taking the necessary precautions present great challenges. The idea of reviving and conserving Egyptian urban heritage areas, as well as reintegrating them into the larger sphere of urban life in Egyptian cities has been a dominant theme in various interests, such as developmental policies and strategies, and urban conservation projects. This is due to their historical and cultural importance, as well as their urban and planning constituents.¹

Throughout the past decades numerous studies and projects have been undertaken for the conservation and development of historical areas and their facilities. Many plans and strategies were prepared, and many seminars, conferences and ministerial committees were held to examine the conservation of these historical areas. Legislation, laws and decrees were issued for this purpose. Despite the variety of these different official efforts, most of them have not been implemented due to a number of different political, economic, administrative, social, and even technical reasons. The areas of urban heritage and their grand history have been a rich field for various official projects which are still under way.² The 1960s witnessed a large-scale proliferation of replacement and renovation projects in the historical centers, seeking to revive them by renovating their infrastructure and providing urban housing. This development was achieved through the construction of governmental housing complexes in various urban and architectural styles prevalent at the time, which, however, are incongruous with the traditional urban surroundings. These interventions contributed to the destruction of the historical texture

¹ Serageldin, I. 1997b. Solving the Rubik's Cube: Cultural Heritage in the Cities of the Developing World. Egypt

² Galal Abada, Grassroot Initiatives versus Governmental Efforts to Preserve Urban Heritage in Egypt, Bibliotheca Alexandrina, 2008.

of these areas and caused much of the deterioration and disintegration which these areas suffer from today. These projects proliferated in great numbers in various locations in Egyptian cities, as is the case for example in the area adjacent to the Sultan Hussein Mosque in Historic Cairo, and at the heart of el-Gamalleya in the wake of the destruction of groups of historic markets (wekala). Similar housing complexes were constructed in el-Darrasa on parts of the Eastern City Wall. Residential and office buildings have spread across the areas of the Citadel, el-Ghourya, el- Nahasseen, and around the Mosque in the Hussein Area, as well as other sites, often destroying the historical urban and architectural riches which represent some of the rarest archeological urban locations to be found in the Islamic World. These locations are not only significant because of their historical importance and numerical concentration, but also because it is a rarity to find them all together in one harmonious historical urban texture.

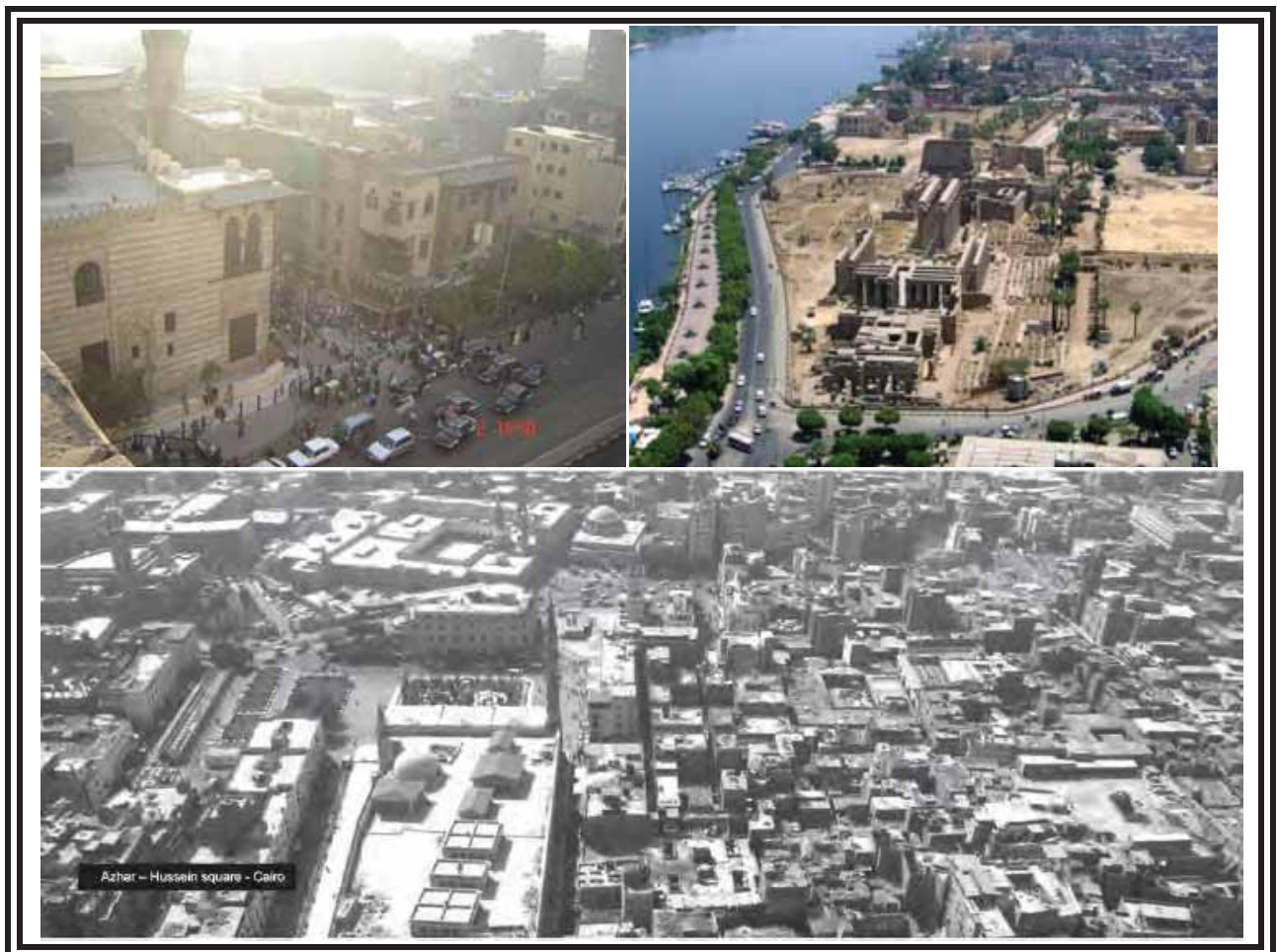


Figure 6-5 Examples of Egyptian urban heritage sites

Various organizations have undertaken pioneering projects, such as the projects carried out by the General Authority for Urban Planning in 2000, seeking the improvement of the urban environment and the preservation of the urban character of the certain regions of

Cairo (prepared for ten neighborhoods of various historical values). However, these distinctive projects were not implemented, and the National Authority for Urban Planning simply looked into the feasibility of these projects, without establishing the necessary implementation, funding, legal and administrative mechanisms.¹

6.3.1 Aspects of Official Efforts in the Conservation of Urban Heritage

Official efforts exerted for the conservation and the development of urban conservation areas represents the methods adopted by the local authorities in dealing with the medium city centers in various regions such as Assiut, Sohag and Aswan. In the light of this situation, it is possible to sum up some of the aspects that characterize official efforts in the following points:²

1. Neglecting the documentation and the recording of the urban heritage

It is observed that governmental bodies do not undertake any documentation or recording of the urban heritage, with the exception of some modern works undertaken by the Centre for the Documentation of the Cultural and the Natural Heritage. This is illustrated in the absence of official detailed maps (of ratio 1/500 for example) which would document the nature, features, texture, streets and buildings of these areas. For example, most documentation efforts for the historical areas go back to the detailed maps set by the Land Survey Office in the 1930s. These certainly do not represent reality any more. Fig6-6

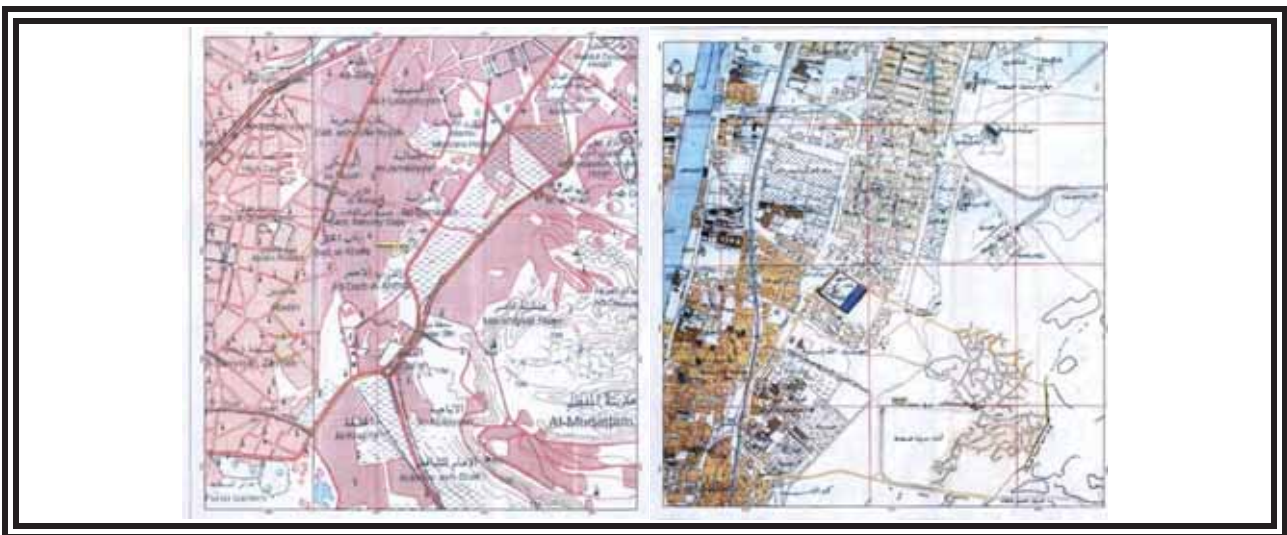


Figure 6-6 maps of Egypt with no details

¹ Cultural heritage and development in the Arab world / editors, Fekri Hassan, Aloisia de Trafford, Mohsen Youssef ; foreword Ismail Serageldin. – Alexandria, Egypt : Bibliotheca Alexandrina, 2008.

² Ibid

2. The limited perception of official bodies of heritage areas

This “official” perspective of the urban heritage areas is restricted mostly to shanty areas or low-level urban communities – regardless of their historical value – which surround archaeological sites or landmarks that need to be preserved and conserved by force of law. Yet these historical areas are to a great extent removed. This official perspective also refuses to recognize the historical areas that came into being following the time of Mohamed Ali, in accordance with the Monuments Law which states that a building or site must have survived for at least a hundred years to be protected, recorded and preserved. Hence the historical areas and sites of the nineteenth and the twentieth century’s, as well as the industrial heritage sites and the unique examples of popular and rural structures, and traditional historical areas which combine material and non-material constituents of heritage, do not receive any form of official preservation, and are thus vulnerable to destruction.

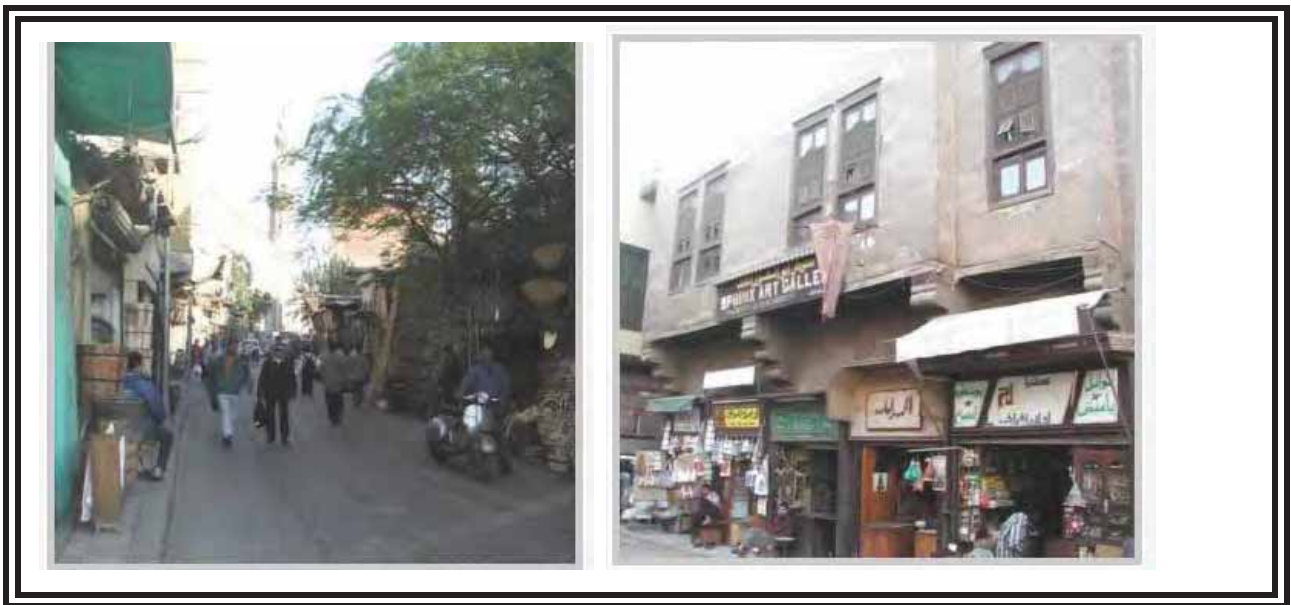


Figure 6-7 shanty areas or low-level urban communities which surround archaeological sites

3. The overlapping of the administrative responsibilities of the authorized governmental bodies

In most areas of urban heritage in Egyptian cities, the administrative responsibility for these areas is divided between a number of different governmental authorities (e.g. the local, tourism, archaeology, and endowments authorities) in addition to those with personal interests. This leads to the fragmentation of the responsibility for these areas. The failure of these official bodies to provide a unified strategy of planning and administration is another obstacle to the improvement of these areas.

4. The absence of legislations for urban conservation and preservation

There is currently no clear legislation that preserves and conserves Egyptian urban heritage, and neither is there legislation for the preservation of monuments. Furthermore, issuing of legislation, particularly addressing the conservation of the urban heritage and the cultural tradition of Egyptian cities faces obstacles, as does the issuing of a law for the regulation of cultural harmonizing works and for the conservation of the urban heritage. This is due to the conflicting interests of some authorities and the overlapping of their respective administrative responsibilities, with the insistence of certain supervising bodies, such as the Ministry of Housing, or the Ministry of Local Development, on controlling the urban environment in Egyptian cities, including the sites of urban heritage in general, regardless of the historical and cultural value of these areas. For example, the laws for construction works are implemented in general in most quarters of the Egyptian city, without discrimination, and without considering areas of heritage as protected sites worthy of conservation which conforms to special regulations.

5. The contradiction between the official conservation efforts and the quantity and quality of problems facing the urban heritage

In general, official conservation efforts have been characterized by insufficient successive governmental developmental efforts towards finding practical solutions for urban heritage areas. These efforts have often failed because they have adopted general and rigid developmental policies that are not compatible with the nature of these areas and their cultural value. Added to this, there is the problem of a general lack of awareness, in particular amongst the large number of officials and decision-makers, concerning the significance and the cultural importance of these areas.

6. Resorting to local solutions and formal treatments in urban conservation

Many conservation projects in historical areas in Cairo, Alexandria and other regional cities of Egypt have illustrated that the local authorities resort to the superficial renovation of facades or of some squares, streets, or other cultural spaces through formal plastic surgeries, without any understanding of the factors governing the harmony and authenticity that characterize these areas. This has led to the vanishing of some distinctive cultural values in these areas, as well as wasting precious opportunities for their adequate conservation.

7. The dominance of an elitist outlook in dealing with heritage

The greater part of governmental efforts exerted for the conservation and development of areas of urban heritage, in the form of various structural or main plans – such as the renewal of the area surrounding the Al Azhar Mosque for the construction of Azhar University in the 1960s, and hence the destruction of a vast area from the heart of the city; or infrastructural constructions such as bridges – have resulted in radical changes in the historical areas in order to achieve great planning ambitions, regardless of the role of the citizens or the local communities in the processes, and the means to benefit from the potential constituents of these areas. The disregard for the financial and economic aspects for these projects has also led to stopping their implementation, thus delaying the opportunity for development in these areas.

8. The lack of a comprehensive vision for dealing with urban heritage

It may be said that official efforts for dealing with the urban heritage – with rare exceptions – have lacked a comprehensively integral vision for the conservation of the urban heritage constituents. They have failed to develop resources linked to the developments, which are necessary to improve the local economies, promoting the touristic services offered, and improving urban lifestyles by providing acceptable living standards, as well as raising the cultural and societal awareness of their value, thus guaranteeing their survival. It may also be said that most of the official conservation efforts have adopted a unilateral approach to dealing with historical sites, which caused an imbalance both culturally and in the value diversity which distinguishes these areas.

6.3.2 Aspects of Non-Governmental Organizations Efforts in the Conservation of Urban Heritage

Most of these efforts are important individual initiatives as a first step towards the conservation of urban heritage areas, regardless of the great variety of methods followed, the objectives, the mechanisms and the achievements. In general, these efforts, despite their limitations, were effective and relatively suitable for the requirements of development and their appreciation of the need to preserve these areas, and the needs of the local communities. These characteristics stand in spite of the lack of organization, the lack of clear methodologies, the shortage of financial support, as well as the absence of

official support at most times. The most important aspects which characterized these initiatives are:¹

1. Exerting pioneering efforts in documenting and recording urban heritage

Documentation of the urban heritage, which ranged between established individual efforts and following methodological and systematic approaches, represents important and unique fields of these initiatives in this aspect.²

2. Complementing Conservation Operations and Developmental Problematic in Historical Areas

Numerous initiatives highlight significant attempts at linking between conservation operations and the problematic of development in historical areas, as well as valuable attempts to respond to the requirements for conservation and developmental essentials in the light of the available possibilities and expertise which represent important starting points in developing comprehensive practices.

3. Establishing New Concepts for Societal Partnership

Generally speaking, NGOs initiatives are distinguished by having established new and creative concepts and practices for societal partnerships, which have led to the interaction of many parties in obvious effectiveness through specific roles for the realization of the objectives of these initiatives. This heralds good results in constructing a general framework for a partnership between civil society and official governmental bodies.

4. Deficiency of legislative, administrative and organizational mechanisms

Grassroots initiatives have clarified the extent of the deficiency in the traditional governmental executive mechanisms such as ministries and local units.

5. The limited effect of non Governmental organizations

Despite the limited resources available, and the limited spheres of effect, grassroots initiatives are increasing. Most initiatives need publicity, in addition to the discussion of lessons learned from them and the amending of some for greater benefit in other efforts.

¹ Cultural heritage and development in the Arab world / editors, Fekri Hassan, Aloisia de Trafford, Mohsen Youssef ; foreword Ismail Serageldin. – Alexandria, Egypt : Bibliotheca Alexandrina, 2008.

² URL: <http://whc.unesco.org/en/statesparties/eg/documents/>

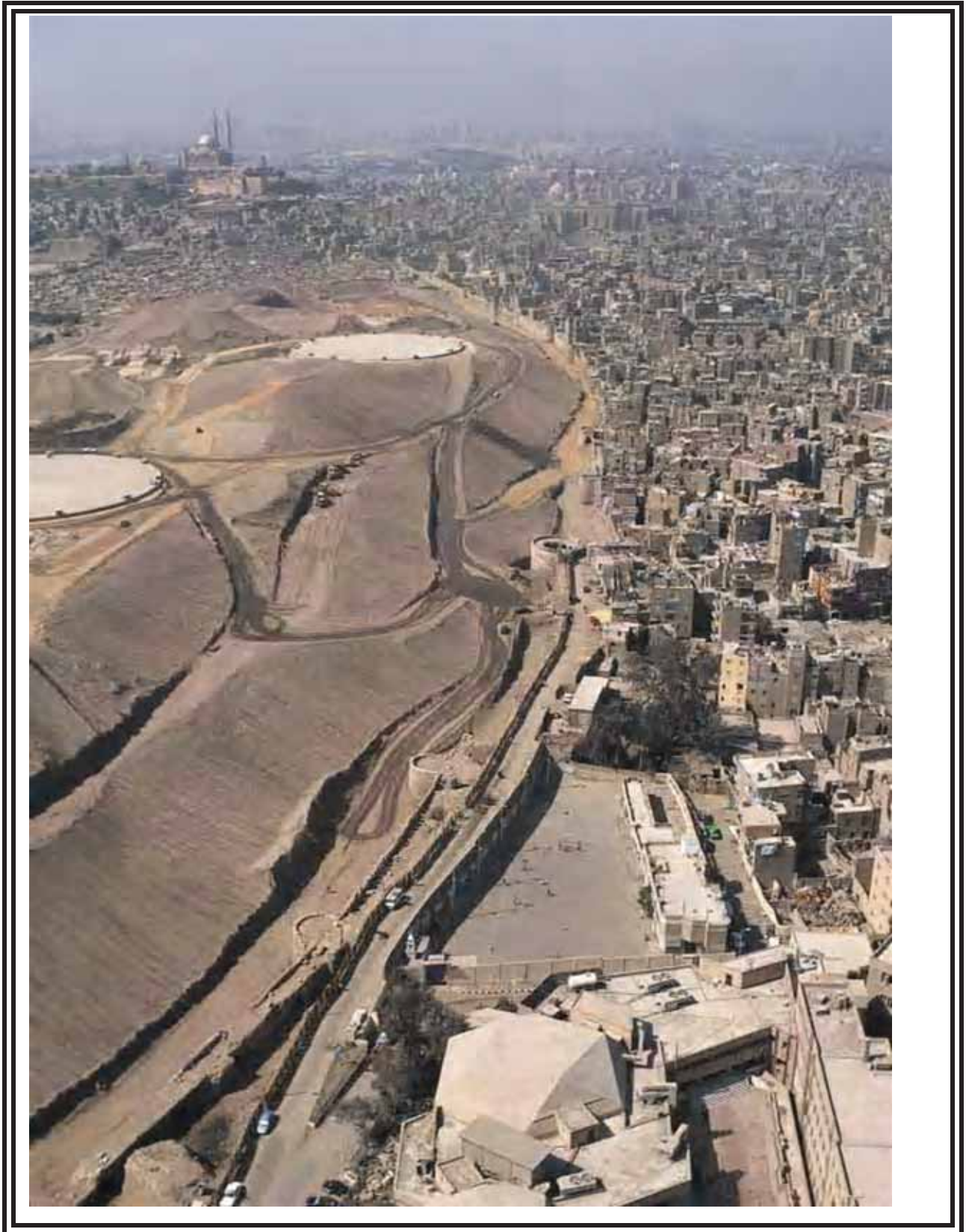


Figure 6-8 An aerial view of the project site shows the topography of the A:har Park after master grading (2000). On the edge of the site it's the uncovered Ayyubid city wall (12th century) and to the right the Darb al-Ahmar district. In the distance two major landmark can be seen: to the left Salah al-Din Cs Citadel and to the right; the complex of the Sultan Hassan Mosque.

6.4 Al-Azhar Park

Project Information

Location: Darassa, ,Cairo- Egypt. _500-year-old mound of rubble in the inner city, between the eastern edge of the 12th Century Ayyubid city and the 15th Century Mamluk “City of the Dead”.

Project Type: Park

Designed by: Aga Khan Cultural Services- Egypt

Size: 30- hectare (74 acre),

Year Conserved: 1984-2002

6.4.1 Project Background

The origins of Al-Azhar Park project date to 1984, when the Aga Khan Award for Architecture organized a conference on the subject of *The Expanding Metropolis: Coping with the Urban Growth of Cairo*. At that time, the city was confronted by the array of contemporary development challenges faced by many cities, not least population pressures, a decline in the quality of housing and the attendant problems these conditions create. Despite these challenges, the question of how to reconcile conservation and development was a fairly new one.¹ It was clear that Cairo needed more green space. Fig 6-9 One study found that the amount of green space per inhabitant was roughly equivalent to the size of a footprint. It is one of the lowest proportions in the world. It was on the occasion of the conference The Aga Khan announced his decision to finance the creation of a park for the citizens of the Egyptian capital.



Figure 6-9 Old Cairo pic before Project

¹ Aga Khan Trust For Culture, project brief 2005

The Park project was therefore intended to be a case study for a variety of development challenges, ranging from environmental rehabilitation to Cultural restoration. The objective was to create models of development that could be replicated in many other settings, and in particular in the historic cities of the Islamic world. Almost one-third of historic cities on UNESCO's list of world heritage sites are in the Islamic World.¹ Many face pressures similar to those of Cairo.

6.4.2 Baseline Information

Historic Environment: The project was turning rubble dumps into a park that would act as a catalyst for development. Despite scepticism, the local authorities approved the choice of the site and the first plans were drawn up. The work was delayed by the integration into the Park site of three large fresh water reservoirs, each 80 meters in diameter and 14 meters deep.² Fig 6-10. But in 1990 a protocol was signed between the Aga Khan Trust for Culture and the Governorate of Cairo that led to new plans taking into account the water tanks.



Figure 6-10 The Park site in 1992, before work commenced looking to the south. In the distance to the left is the Citadel of Salah al-Din and in the center, the minarets of the Sultan Hassan Mosque complex.

¹ UNESCO

² Aga Khan Trust For Culture, project brief 2005

Heritage Assets: Many of the opportunities offered by the site derive from its neglect over the centuries as an area purposely excluded from the living urban fabric of Old Cairo. The hilly site is surrounded by the most significant historic districts of Islamic Cairo, all of which are major destinations for visitors to the city. To the west are the Fatimid city and its extension, Darb al-Ahmar, with their wealth of mosques, madrasas and mausolea, signaled by a long line of minarets. To the south is the Sultan Hassan Mosque and its surroundings, as well as the Ayyubid Citadel. To the east is the Mamluk "City of the Dead", with its many social welfare complexes sponsored by Mamluk sultans and dignitaries - an area which has developed into a dense neighbourhood of its own. The hilly topography of the site formed by debris accumulated over centuries, now provides elevated view-points that dominate the city and offer a spectacular 360° panorama over the townscape of historic Cairo. On a clear day one can even see the pyramids.

6.4.3 Environmental Objectives

Minimize the waste by reducing demolition activities: The site posed several technical challenges. It had been a debris dump for over 500 years. This required excavation, grading and replacement with appropriate fill. Over 765,000 m³ was taken out of the Park and 160,000 m³ was used as fill elsewhere on site. A further 605,000 m³ was subjected to geotechnical treatment (sieving, washing, etc.) and mixed with 60,000 m³ of special sand and topsoil to enable the site to be covered with a layer of "good" soil from 0.5 to 2.0 meters deep. A total of 1.5 million cubic meters of rubble and soil were moved, which represents over 80,000 truckloads. Over two meters underneath this layer of top soil is a clay membrane layer, 0.50 meters thick, which had to be laid down and engineered to prevent irrigation water seepage as well as soil settlement. Part of the clay was recuperated from the boring of Al-Azhar tunnel; the rest came from river bed sources not far from Cairo.

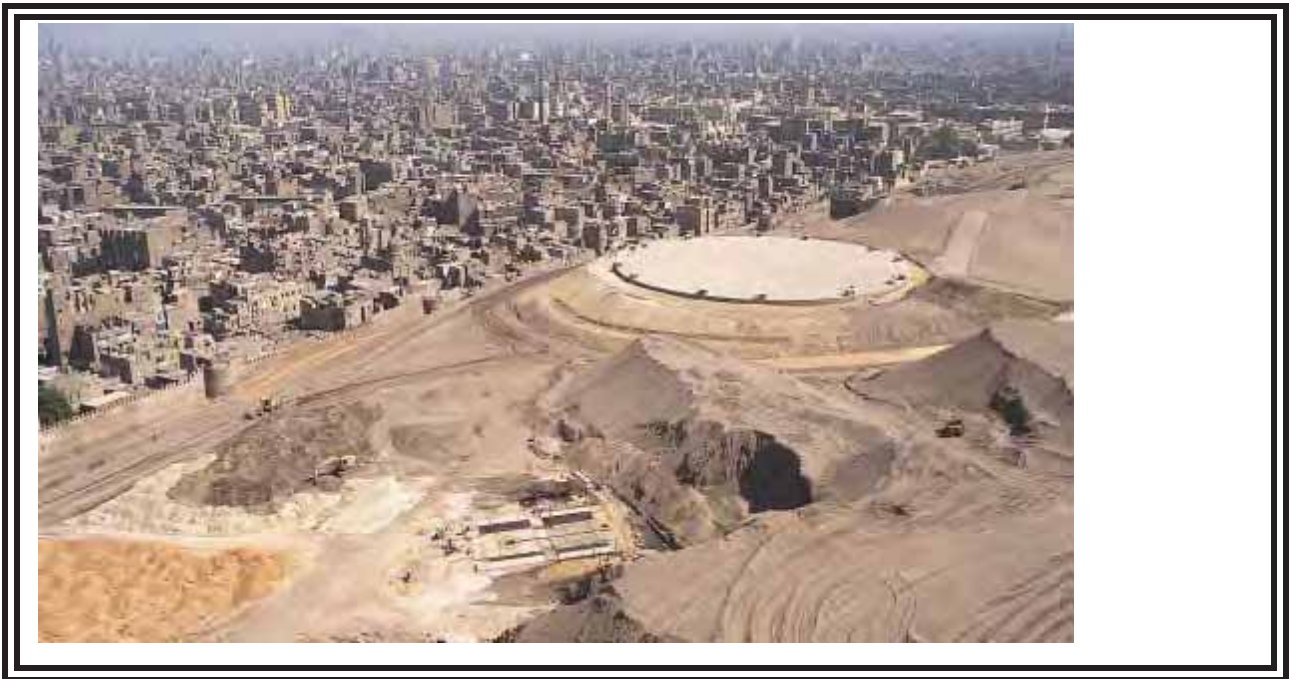


Figure 6-11 An aerial view of the southern water tank in 1999 (seen from the south), being integrated into the emerging new Park topography. At the bottom, in the centre, a prototype of typical pavements, pergolas and water features of the future Park main spine.

Protect, manage and Where necessary improve local environmental quality: To correct high saline levels in the soil, “sweet sand” and top soil were mixed into the top layer, with corrective additives such as compost sulfur and calcium superphosphate. Salinity at present is between 8,000 and 13,500 ppm, which is high for most plants, but will decline as the salts are flushed out by irrigation. During testing stages, many plants died because of the salinity, and had to be replaced with less sensitive varieties.

Achieving high quality and sustainable design for buildings, spaces and the public realm sensitive to locality: The three buildings (Citadel View Restaurant, Lakeside Café and entrance building) were the object of a competition between seven international and Egyptian architectural firms. Fig 6-12. The Citadel View Restaurant was designed by Egyptian architects Rami el-Dahan and Soheir Farid. The Lakeside Café project was awarded to Serge Santelli, Paris. The total surface of the entrance building is 860 m², and the Citadel View Restaurant site is 3965 m², including the external terraces. The Lakeside Café has over 1500 m² usable surface. All buildings have masonry bearing walls with a high-sand-content limestone cladding, marble and stone pavements, and marble and ceramic tiles. All the Park buildings rest on piles or rafts. Nearly all materials used are of Egyptian origin, as is all the furniture, mostly made by local carpenters in Darb al-Ahmar.



Figure 6-12 the three buildings (Citadel View Restaurant, Lakeside Café and entrance building).

Protect, enhance and manage the character and appearance of the landscape including townscape, maintaining and strengthening local distinctiveness and sense of place:

The Park's site was designed by Sites International, an Egyptian landscape architectural firm. Most features of the Park were based on the traditional use of public spaces in Islamic contexts. This legacy can be seen in a variety of styles from different periods and different regions. It is reflected in the bustan-like orchard spaces, the shaded sitting areas (takhtaboush) and the Fatimid archways used in the construction of Park buildings, among other elements. Persian and Timurid elements are also reflected in the water channels and fountains. Specific features of the Park include:

- The Royal Palm Promenade
- Geometric Garden
- Southern lookout
- Children's play area
- Children's amphitheatre and stage
- Northern lookout plaza and kiosk
- Water cascade garden
- Lake
- Orchard
- Playing fields
- Historical wall promenade and amphitheatre



Figure 6-13 variety of styles from different periods and different regions.

The fountain and stream-lake are divided into two systems. The cascade and fountain system, which is approximately 90 meters long, is run by two pumps that re-circulate the water. The stream and lake are fed directly by raw Nile water from a nearby municipal line, a pipe measuring approximately 170 meters off site. The lake water is then filtered mechanically and pumped throughout the Park's irrigation main line. The total length of the main and lateral irrigation lines within the Park site measures approximately 10 kilometers. The Park has all necessary amenities, such as ramps and toilet facilities, for the handicapped. The marble benches and lighting were designed by Sites International and built by local artisans using local materials.

Protect, enhance and manage the rich diversity of the historic environment: The realities of seasonal high temperatures, low humidity, scant rainfall and desert winds imposed severe conditions on the Park's plants and trees. Specialist plant nurseries were created, both on site and outside Cairo, to identify the best plants and trees for the soil, terrain and climate. The nurseries also carried out the propagation of the necessary plants to furnish the Park – 89 varieties of trees, 51 shrubs, five sorts of grass, 14 climbers, 50 groundcover plants and 26 varieties of succulents. Over 655,000 young plants from cuttings and seed were planted. Most of the lawn was planted elsewhere and brought in as turf. The lawn areas required four metric tonnes of grass seed. The nurseries contain over two million plants and trees, which can be used not only for replenishing the Park's vegetation, but for planting in pots in the courtyards and roof terraces of the historic city, for sale to official and private garden contractors and for visitors to the Park. A sales outlet for plants is envisioned on site.



Figure 6-14 Specialist plant nurseries were created, both on site and outside Cairo

Perhaps the most interesting local varieties of trees are Sycamores, *Zyziphus* and four types of *Acacia*. Other species include the *Cassia smallii* and *Sophoras arizonica* and *japonica* trees. The non-Egyptian native plants were developed from stock in the country and adapted to local conditions. A good deal of experimentation was required to find hybrids that would withstand the difficult soil conditions found at the Park. Reflecting garden traditions in both the East and West, many medicinal and culinary herbs were planted in the Park, including laurel, chamomile, mint, lemon grass, coriander and thyme. A wide variety of roses have been grafted onto *Rosa canina* rootstock to ensure that they will thrive in Park conditions. The Park utilises an irrigation system providing water through drippers and sprinklers. The irrigation is regulated by a special weather station in the Park which calculates the water needs based on temperature, humidity and wind speed.

6.4.4 Social Objectives

Reduce anti-social activity: Due to size and centrality, the Azhar Park is expected to fulfill a vital function in expanding park and green space available to the public in Greater Cairo, the population of which stood close to 16 million in 2000. It is anticipated that the Park will attract visitors from other regions as well. The total annual number of visitors is projected to reach as many as 1.5 million in the initial years.

Encourage a sense of community identity and welfare: the Azhar Park improves ethnic relations through the people who feel that their local area is a place where people from different back ground can interact together harmoniously

Improve accessibility for those most in need: the Azhar Park provide better opportunities for people who lives in el Darb al-Ahmar and children under12 to access

the park by receiving discounts for entry and understand local heritage and participate in cultural and leisure activities .Fig6-15



Figure 6-15 Children playing in the fountain

6.4.5 Economic Objectives

Encourage and accommodate both indigenous and inward investment: the land property was available for development. In August 2007, the Governorate of Cairo extended the agreement for operation of the Park for another five years. The main sources of income for the Park will be:

- Entrance fees
- Revenue from the restaurant and the café
- Revenue from sale of snacks through various kiosks
- Special events (parties, shows, etc.)
- Parking fees

- Sale of plants

About 2000 visitors per day are projected. The entrance fee will be higher for foreigners than for Egyptians. Darb al-Ahmar residents and children under 12 will receive discounts for entry.

To enhance the image of the area as a business location: During the peak of the park construction phase, approximately 400 workers were on site daily, involving three main contractors, over 15 specialized contractors, and many material suppliers and vendors. At least 35 fulltime engineers and inspectors are overseeing the work. The Park is expected to permanently create over 250 jobs on site, and other jobs will be created for vendors and suppliers.

6.5 Restoration of the Ayyubid Wall

Project Information

Location: Darassa, ,Cairo- Egypt. 500-year-old Century Ayyubid city

Project Type: restoration of an ancient wall

Designed by: Aga Khan Cultural Services- Egypt

Size: 1.5 kilometers long

Year Conserved: started in 1999 until the end of 2007

6.5.1 Project Background

Cairo's Ayyubid fortifications were begun in 1176 by Salah al- Din, a Kurd of the Ayyubid clan who came from Syria and overthrew the Fatimid caliphate in 1171. They were built to contain the former Fatimid palace-city and its suburbs, the pre-Fatimid city of Fustat and the pre-existing fortifications within a single system. Unlike the first Fatimid wall, the Ayyubid fortifications were built entirely of stone and made use of new defensive devices brought from Syria, such as bent gate entrances and arrow slits reaching the floor.

In the following centuries, Cairo's rapid urban expansion went well beyond Salah al-Din's boundaries, rendering the old walls virtually obsolete. Unlike the other parts of the walled city, however, the eastern section is the only area where urban expansion beyond

the walls did not take place. This was due to the enormous mounds of debris deposited just outside the wall, an accumulation that probably began in the fifteenth century, during the Mamluk period, when the eastern part of the city had declined in importance. The area just beyond the wall remained a dumping ground for hundreds of years, gradually rising to a height of some thirty meters, and forming a major barrier to modern urban expansion. The Mamluk cemeteries, the so-called "Cities of the Dead", developed on the other side of the artificial hills, leaving unbuilt the barren site in between.

Early prints and photographic records confirm that the wall was largely buried by the end of the nineteenth century. Old maps from the Napoleonic era also show that buildings in Darb al-Ahmar were generally built right up to the edge of the city at the time of the French occupation around 1800 AD. Many of the buildings actually abutted the Ayyubid wall and additional rooms were constructed into and indeed on top of the one-time fortifications. Several of these are still in use, posing, in some cases, a threat to the structural integrity of the wall.



Figure 6-16 The southern section of the Ayyubid city wall and the adjacent Mosque of Aq Sunqur "Blue Mosque" and Khayrbek. first: Conditions in the 19th century (David Roberts) second: Conditions in 1992 show the wall buried beneath heaps of rubble and debris.

6.5.2 Baseline Information

Historic Environment: When the Park project began in the mid-1990s, only the crenellations of a buried wall were visible. When the wall was excavated to a depth of 15 meters, a 1.5 kilometer section of the historic Ayyubid Wall and towers was revealed in all its splendour. A huge archaeological conservation task was initiated, in conformity with international standards.

Heritage Assets: The restoration of a 1.5 kilometer stretch of the eastern Ayyubid wall, The Aga Khan Trust for Culture has taken the lead in the restoration of the stretch of the Ayyubid Wall abutting the Park with the coordination and approval of the Egyptian Supreme Council of Antiquities. Other sections of the Ayyubid Wall (north and west of the Park) are being restored by the Supreme Council of Antiquities. after the grading works for the Azhar Park, the major portion of the remaining Ayyubid wall is once again from Bab al-Wazir to al-Azhar Street, forming the boundary between the Darb al-Ahmar district and the Park.

The outer face of the wall is now exposed to view and to natural elements, while on the city side, private development pressures and institutional demands may raise complex urban development issues. Future intervention will have to consider not only the preservation of the wall, but also how to intervene in the surrounding context. Comprehensive planning and design policies had to be developed both for the residential fabric abutting the wall and regarding the points of access and the pedestrian promenade along the western edge of Azhar Park.



Figure 6-17 Map of Cairo around 1800 as surveyed by the French expedition under Napoleon. Clearly visible are the hills of Darassa. It is also clear that 200 years ago the old city already abutted the Ayyubid wall.



Figure 6-18 restoration for the wall

6.5.3 Environmental Objectives

Protect, enhance and manage the rich diversity of the historic environment: the questions of how best to consolidate and protect it were instrumental in establishing a clear policy of intervention for the historic urban fabric attached to the wall, and enhancing the wall's role as a potential attraction for future visitors to the new Azhar Park. Intervention in the surrounding urban fabric advocate respect for the changes accrued over time, in order to preserve the integrity, scale and significance of the wall in its current configuration and context. Ultimately, the proposed interventions promote continuity rather than radical transformation. The long-term goal is to integrate and harmonize the remnants of a valuable past with present realities and future uses in ways that are compatible and sustainable. Establishing didactic programmes and experiences in order to enhance appreciation of the wall as a monument and important urban feature of Islamic Cairo, to explain its changing role in the development of the city and to introduce visitors to the like of the community that inhabits the surrounding district: Planned initiatives include visitors' circuits and exhibits through the Darb Shoughlan School and along the ramparts and interior galleries between towers 4 and 5, and in Burg al- Mahruq, featuring the presentation of the archaeological, historical, military, cultural and social aspects related to past and contemporary uses of the wall. The possibility of a major archaeological park is also being discussed for the northernmost area, between towers 14 and 15, where there is a unique opportunity to explore the archaeological

remains along the city side of the wall, buried since Mamluk times. Finally, the establishment of a space for the performing arts and other cultural activities is planned near the Khayrbek complex, adjoining the southern edge of the Historic Wall. This is to be used by local artists and musicians to stage folk dramas, musical events, festivals and children's shows, offer a focal point for the community and provide visitors with a better understanding of the local culture and traditions.

Minimize the waste by reducing demolition activities: respect the cumulative age—value of historic structures, by recognizing the stratification of physical records of human activity, displaying the passage of time and embodying different materials and techniques, as well as changing cultural beliefs and values. The general survey provided an analysis of the masonry and identified areas of significant deterioration, distinguishing between loss of facing stone to the rubble core and total loss of the wall. It also documented the presence and extent of previous repairs. The detailed condition survey provided a fuller quantitative analysis, complemented by a qualitative assessment of the causes and effects of deterioration. Severity of loss, for example, was classified according to extent and depth, as well as to whether the process was still active or inactive. In addition, samples were taken for laboratory testing to ascertain the exact nature of the materials and their conditions and problems.



Figure 6-19 The turrets of the central section of the Ayyubid wall were almost buried in debris in 1994, before work on the Park began.



Figure 6-20 The most prominent tower of the Ayyubid wall (Bab al-Mahruq) still buried in debris (1994). A mason cutting stone for wall restoration

Achieving high quality and sustainable design for buildings, spaces and the public

realm sensitive to locality:

In addition to documenting the condition of the wall, the general survey analyzed the wall's contextual relationship to the adjoining urban fabric. The extent and configuration of the abutting houses was recorded by the team and assessed with regard to their use, condition, date of construction, architectural integrity and significance. In addition, a series of typical sections documented the physical connection between the wall and the adjacent buildings, and, in particular, whether these structures are built up against, on top of or into the wall at the lower levels.



Figure 6-21 The pilot restoration project (between towers 5 and 7) under implementation.

Protect, enhance and manage the character and appearance of the landscape including townscape, maintaining and strengthening local distinctiveness and sense of place: by avoiding harm to historic structures, either by minimizing physical interference when reestablishing structural and aesthetic legibility and meaning, or by intervening in ways that will allow other options and further treatment in the future.

6.5.4 Social Objectives

Encourage a sense of community identity and welfare: Designing pedestrian access and circulation along the western side of the Park to enhance the perception of the Historic Wall as a dynamic edge and meeting point rather than as a barrier between the community and the Park: Reaching the right balance is essential here, since two opposite dangers must be avoided: on the one hand, that of opening access indiscriminately as this would invite abuse of the monument, its commercialization and touristic consumption; and, on the other hand, that of treating the wall as a forbidding edge separating the Park from the community, which would only result in the perception of the new "moat" as a backyard for disposing trash. Avoiding these two extremes, the proposed access and circulation system identifies the locations of the former city gates as the natural and historically appropriate connections between the Park and Darb al-Ahmar.

Improve accessibility to essential services and facilities: three entrances are being revived: Bab al-Barvqiyya, close to the main traffic artery of al-Azhar Road, to serve as the main access from the north-western edge of the Park; Bab al-Mahruq, the vanished gate now the subject of an archaeological investigation, to create a mid-point entry; and Bab al-Wazir at the south-western corner of the Park, to provide access close to the main religious sites and historic monuments along the southern stretch of Darb al-Ahmar Street. In addition, two more connections are proposed in conjunction with the visitors' exhibits and circuits at Darb Shoughlan and Burg al-Mahmq. All of these links are conceived as meeting points to foster visitor and community interaction and sustain carefully planned venues into the daily life of the Darb al-Ahmar area.

- To safeguard authenticity as a cultural value associated with the original making (or re-making) of an object or site by recognizing human authorship or the record of time and place;

6.5.5 Economical Objectives

To promote heritage based sustainable tourism: The conservation of the original structure of the wall and the preservation of the living city fabric around it should be seen as the best antidotes to further decay and the potentially destructive commercialization that can be induced by excessive numbers of visitors and uncontrolled tourism. Certain risks for the wall and Darb al-Ahmar can be foreseen from the Park. Too often, cultural resources around the world have often become mere commercial commodities for mass tourism, with the result that genuine historic places have been compromised and emptied of meaning. Local residents have often become overly dependent on an unpredictable tourism service economy.

To enhance the image of the area as a business location: by attracting new investment and additional skilled workers to the area. Introducing activities that are relevant to promoting a deeper understanding of the cultural heritage among visitors and residents and the development of local skills and abilities to preserve and protect Islamic Cairo: The wall offers great opportunities in this respect, both as an arena to demonstrate the aims and methods applied to its discovery and conservation and as an ongoing naming ground, where local craftsmen, national bodies and international institutions can come together to explore and identify appropriate restoration techniques. These experiences will also promote the creation of a manpower base specialized in traditional building crafts, modern restoration techniques and small enterprise development, all of which are needed throughout Islamic Cairo. Conservation can thus be linked to programmes that foster economic development and future employment opportunities for the local community. The Ayyubid wall project involves more than 200 workers and training positions which have gone primarily to the people from Darb al-Ahmar community. In addition, most of the materials used in the restoration of the historic wall come from the local market.

6.6 Neighbouring District of Darb al-Ahmar

Project Information

Location: Darb al-Ahmar district, Islamic Cairo- Egypt.

Project Type: Sustainable conservation of the district

Designed by: Aga Khan Cultural Services- Egypt

Size:

Year Conserved: From 2005 to 2008

6.6.1 Project Background

The neighbouring district of Darb al-Ahmar was poor; it featured one of the richest concentrations of Islamic art and architecture in the world. The challenge was to revitalize this heritage in ways that turned traditional notions about cultural monuments on their head - that rather than being a drain on resources, they could be a stimulus for social and economic development. By late 2004, more than EGP 25 million (US\$ 4 million) had been spent on socioeconomic rehabilitation in Darb al-Ahmar, for housing projects and monument restorations with generous grants from the Egyptian-Swiss Development Fund, Ford Foundation the World Monuments Fund and AKTC. A larger programme for the rehabilitation of Darb al-Ahmar will be implemented with major contributions from the Social Fund for Development, Ford Foundation, Canadian International Development Agency (CIDA) and AKTC.

6.6.2 Baseline Information

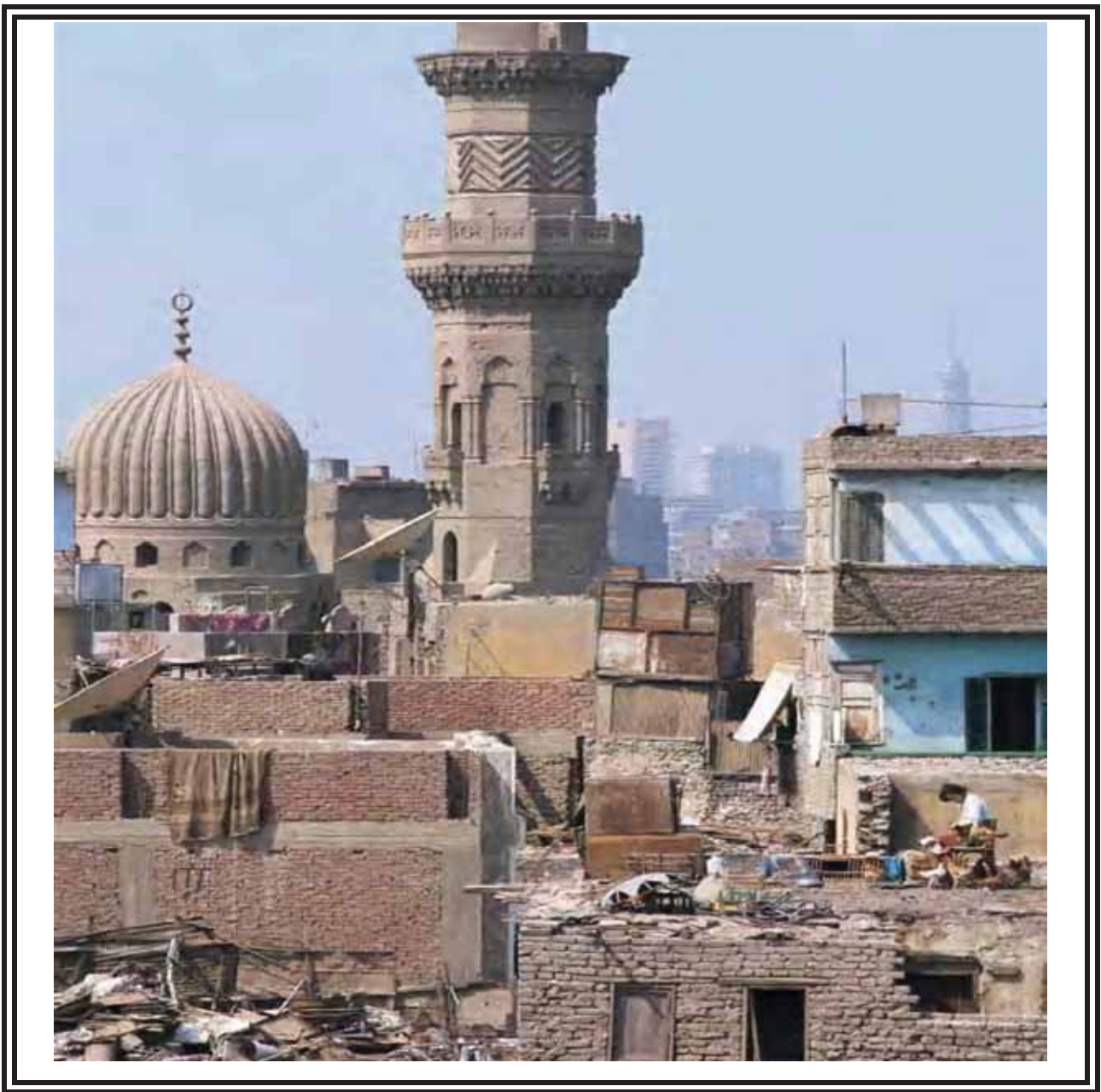


Figure 6-22 Rooftop view of the Aslam neighbourhood in Darb al-Ahmar illustrating the dense existing housing fabric, much of which is in poor condition and in need of upgrading.

6.6.3 Baseline Information

Historic Environment: The neighbourhood of Darb al-Ahmar is one of the poorest and most populous areas of Cairo, lacking adequate sanitation and rubbish-collection services, with refuse often piled up in the streets and in courtyards. Faced with low rents, absentee landlords invested little or nothing in their buildings, with predictable results: roofs and walls collapsed, the historic monuments came under greater and greater stress, and expectations for the quality of life declined along with physical decay. Yet community

and family life remained strong. Small family businesses, including carpentry, tile making, and other small crafts, continued to provide a portion of the local population with a living.

These developments will dramatically improve the image and importance of the old city of Cairo over the course of the next several years. They are indeed expected to attract many new visitors and bring significant economic benefits to Darb al-Ahmar. But they also present serious risks for an area which is both socially and environmentally fragile. Unless held in check and properly channeled through a conscious planning effort, speculative pressure may soon result in a pattern of uncontrolled development in the area, leading to the expulsion of both the current residents and the existing activities, and thus paving the way for a total substitution of the traditional urban fabric. The common, though incorrect, perception of Darb al-Ahmar as a haven for crime and drug-related activity may also sustain radical concepts of intervention aimed at clearing and sanitizing the district, thus further contributing to irreversible transformation. Awareness of these potential risks prompted AKTC to initiate, in parallel with the strategic program, a plan of action to guide future interventions in the district.

Historic Assets: The project for socioeconomic development of the neighbourhood was conceived with the idea that the removal of the former rubble dump and its metamorphosis into a park would have a catalytic effect on the general improvement of the district. However, to ensure this result, the project's scope had to encompass the cultural monuments in the neighbourhood and the people of this area. This approach took the form of an integrated urban area development plan containing a series of pilot interventions aimed not only at the restoration of landmark buildings, but at wide-based socioeconomic development. The Aga Khan Trust for Culture brought together institutional partners, local non-governmental organisations, municipal institutions, neighbourhood representatives, local businessmen and people living and working in the area. A detailed survey of the local population's socioeconomic needs was made and a series of meetings were then held to determine the community's own development priorities. Through consultations with the residents, a list of priorities emerged, including training, sanitation, housing rehabilitation, a need for microfinance, rubbish collection, primary health care and a community centre, among others.

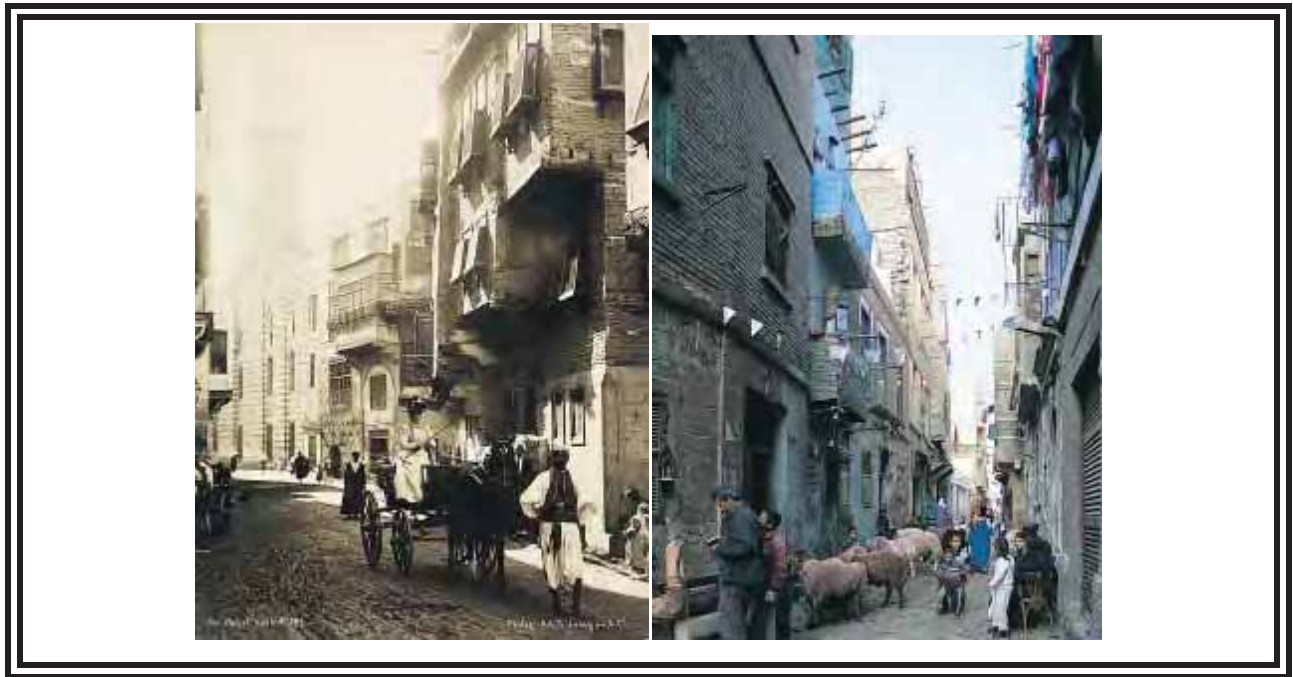


Figure 6-23 view of the main spine of Darb al-Ahmar; taken in the 1920s and, opposite a typical neighbourhood street as it appears today.

Issues and Opportunities: Darb al-Ahmar suffers from the weaknesses commonly found throughout Islamic Cairo (and many other historic city centers in developing countries), the combined result of a series of social, economic and physical factors:

- Low family incomes and an economic base that often lags behind development in newer parts of Cairo;
- A deteriorating housing core resulting from unrealistic planning constraints, pending demolition orders, limited access to credit and widespread insecurity of tenure;
- Continued deterioration of monuments and historic structures;
- The consequences of the 1992 earthquake and a lack of public investment and regular upkeep of city infrastructure; and
- The absence of essential community facilities and services.

But the district also has significant strengths and opportunities that are the source of the area's vibrant character. These strengths are the result of the district's closely integrated physical and social fabric, namely:

- A traditional layout and pedestrian orientation where housing, open spaces, commerce, mosques and places of social gathering are integrated and create a highly cohesive urban environment;

- An outstanding collection of mediaeval monuments and historic buildings;
- A dense residential core where neighbours help and depend upon each other;
- A well-established community with a population largely employed in productive activities; and
- An important pool of skilled workers and small enterprises.

6.6.4 Environmental Objectives

Improve Air Quality: with duration of four years, was started in January 2004. During the second phase, rehabilitation and restoration of a substantial number of houses is foreseen, as is open space improvement.

Minimize the production of the waste: Currently, the Trust is assisting the local government authority and its new private solid waste contractor to improve the garbage disposal process in the area. Preparations are in progress to extend coordination to the entire Darb al-Ahmar district. AKTC has worked as a broker between residents and the government-appointed private contractor in order to ensure proper and timely collection of garbage.

Protect, enhance and manage the rich diversity of the historic environment: Historic buildings in Darb al-Ahmar include some of mediaeval Cairo's finest historic monuments. There are 65 monuments registered by the Supreme Council of Antiquities in the area, as well as several hundred unregistered but architecturally significant buildings. AKTC targeted three representative projects: conservation of the Umm al-Sultan Shaaban Mosque, restoration of the Khayrbek complex (composed of several associated buildings, which in the future will be used as space for conducting administrative training classes) and the rehabilitation and adaptive reuse of the former Darb Shoughlan School, which now houses the Community Centre and AKTC's offices. A library was donated to the Community Centre by the German Sandstorm Group and a computer centre by Daimler-Benz. These initiatives are being undertaken through special agreements between AKTC, the Supreme Council of Antiquities and the Ministry of Awqaf (Religious Endowments).



Figure 6-24 Umm al-Sultan Shaaban mosque and minaret restoration project.

The fourteenth-century Umm al-Sultan Shaaban mosque and minaret restoration project featured stabilization of the roof and reconstruction of the top of the minaret, as well as repair of damage caused by the 1992 earthquake.

Achieving high quality and sustainable design for buildings, spaces and the public realm sensitive to locality:

The stabilization and partial restoration of the Khayrbek complex (named after the first Governor of Egypt after the Ottoman conquest) includes the thirteenth-century Palace of Alin Aq, the Khayrbek Mosque and Sabil- Kuttab, a ruined Ottoman house, as well as surrounding open spaces. The entire complex is expected to provide a setting for recreational and cultural events and to provide a focal point in the district for residents and visitors. The rehabilitation of the former Darb Shoughlan school, an early twentieth century building located along the historic wall, involved extensive renovation of a structure that was gutted. The building provides the space for a community centre in a context that sorely lacks public facilities. The re-use of the building will also feature office space.

6.6.5 Social Objectives

To improve health of the population overall: Provision of basic social services (health, education and solid waste disposal) will be addressed in collaboration with local institutions active in these sectors and by strengthening their organizational and

institutional capacities. A primary health care clinic providing a range of services, particularly to women and children, has been operating under the project umbrella.



Figure 6-25 the primary health care clinic

To improve qualification and skills of adults: Many of the skills-training programmes have been implemented in conjunction with restoration and rehabilitation interventions on the Ayyubid Wall or in restoration projects in the district. Specifically, building tradesmen (masons, carpenters, plumbers and electricians) have been given product quality training. Apprenticeships offered to local youth in connection with stone masonry and carpentry, among other trades. Fig 6-13. During 2004, 70 women were enrolled in the adult literacy programme. as well.



Figure 6-26 the skills-training programmes

To offer everybody the opportunity for rewarding and satisfying employment: Training has been offered by local master craftsmen and technicians as well as through a handful of foreign experts. The project has offered over 150 training positions in activities such as stone carving, masonry work and materials conservation. Park construction has also stimulated the rediscovery of lost skills, such as the restoration of

the intricate traditional windows (*mashrabiyya*). In the restoration process of the Darb Shoughlan School, which was once a gutted building, the need for floor tiling matching the original tiles led to the rediscovery of a forgotten *opus sectile* technique. The tile maker has revived the process, raised the quality of the tiles to the required standards, and has sparked interest in exports to Europe.



Figure 6-27 local master craftsmen and technicians

Reduce anti-social activity: by increasing the employment opportunities will reduce the actual levels of crime. Because the project hires most of its staff members from the Darb al-Ahmar community, by the end of the project, staff will be technically and administratively able to carry out the activities and direct the project.

Improve the quality of where people live: through the satisfaction of people with their neighbourhood as a place to live

6.6.6 Economical Objectives

To enhance the image of the area as a business location: Despite the decline of the neighbourhood's physical structures, the entrepreneurial spirit has not died. What was missing was the means to start or expand the small businesses in the area. Since the beginning of the programme, a variety of businesses have been either started or further financed within three principal categories: shoemaking, furniture and tourist goods. Loans are used to buy new materials for traditional workshops or to create new businesses, such as a dry cleaner and an Internet café. The microcredit programme was

completely revised in 2004 and a comprehensive microcredit operation manual was developed and updated. In addition, a loan tracking software was installed. With these changes the programme was able to reach close to 400 new borrowers, with a near 100% recovery rate on loans within the first six months. Housing credit and business development services are planned for the future. By the end of the second phase, in 2008, it is expected that the total microcredit expenditure will be more than US\$1 million per year.

To encourage and accommodate both indigenous and inward investment: As a part of the programme. Other apprenticeships with local businesses have been arranged, through a stipend system, in the fields of computers, mobile phone services, automobile electronics, office skills, furniture making and tourist market goods.

To encourage sustained economic growth: The existing credit programme will be expanded to stimulate entrepreneurship and increase levels of income for the area. The successful employment scheme started during the first phase of the programme will be continued and expanded. In addition to the socioeconomic programme for Darb al-Ahmar, planning is underway for the construction of an urban plaza with a large car park, at the northern edge of the site. This will provide direct economic impetus to the surrounding district.



Figure 6-28a sustained development for the area.





6.7 Siwa Oasis

Project Information

Location: Siwa Oasis is in the western desert of Egypt “approximately 560 kilometres from Cairo and 70 kilometres from the Libyan border”

Project Type: Sustainable development for the city

Conserved by: Canadian International Development Agency CIDA

Year Conserved: 2004 to 2010

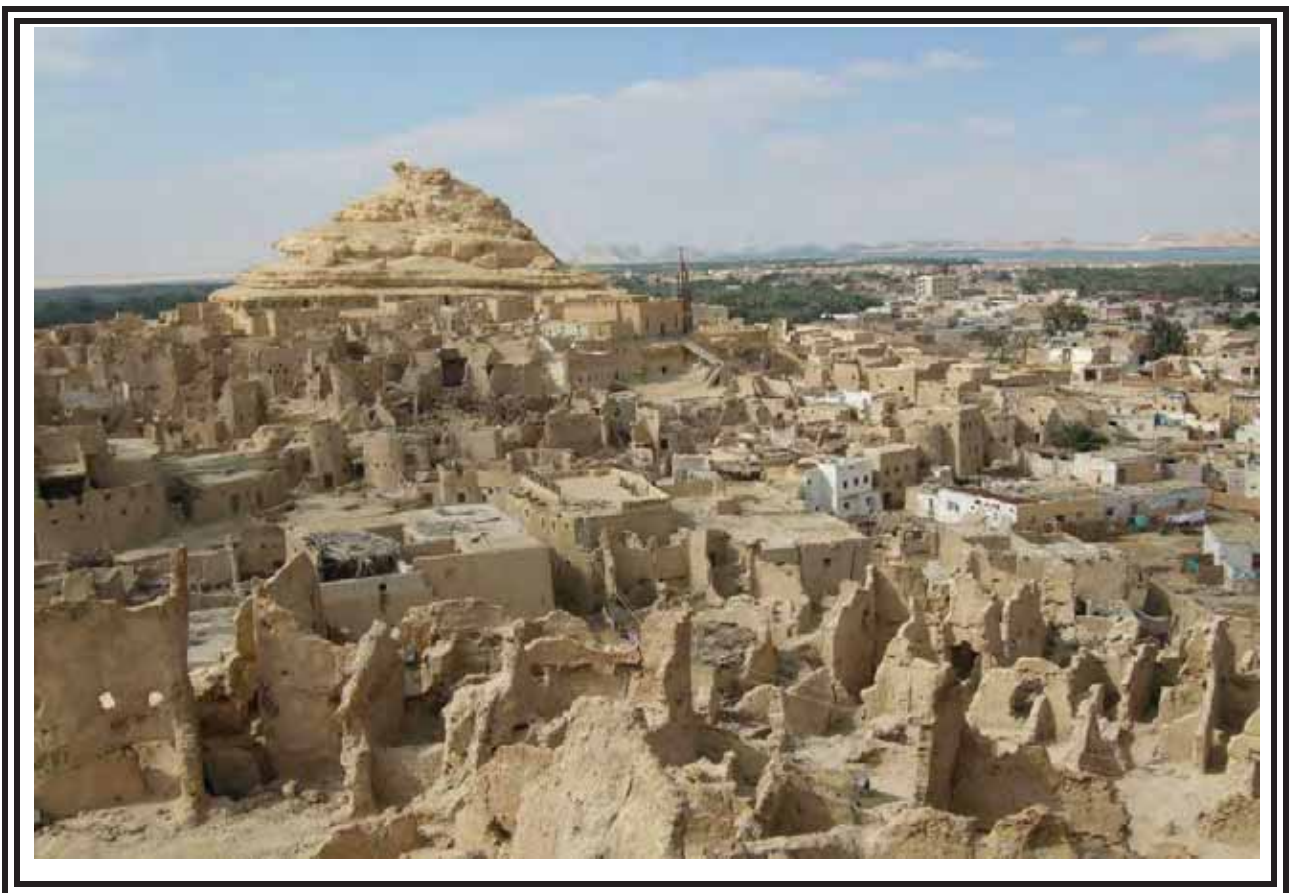


Figure 6-29 Siwa Oasis

6.7.1 Project Background

This project aims to revive the cultural heritage and promote a sustainable use of natural resources, through rehabilitating traditional houses, fostering ecotourism activities and improving the handicraft tradition in order to produce items for the local market and to evaluate the possibility to address the products to a more large market as the Egyptian or international one. Traditional architecture, natural and cultural resources and local handicraft production are rich and valuable, moreover to preserve this heritage is a way to promote local economic development. After several consultations with the Canadian

International Development Agency (CIDA), it was concluded that with a population of only 20,000, Siwa would be a suitable place to start a sustainable development project.¹ Siwa's Sustainable Development Initiative includes several projects: Adrere Amellal, Shali Lodge, Siwa Women's Artisanry Initiative, Sustainable Agriculture, Cattle Initiative, Renewable Energy and other community development projects.²

6.7.2 Baseline Information

Historic Environment: Located in the western desert at the borders with Lybia, Siwa is the most mysterious of all Egypt's oases; its history has been shaped by all major civilizations. The Siwan people have their own culture and customs and, beside Arabic, they speak own Berber (Amazigh) language. Women still wear traditional costumes and silver jewellery and Siwa remains one of the best places to buy traditional local handicrafts. Fig6-25.

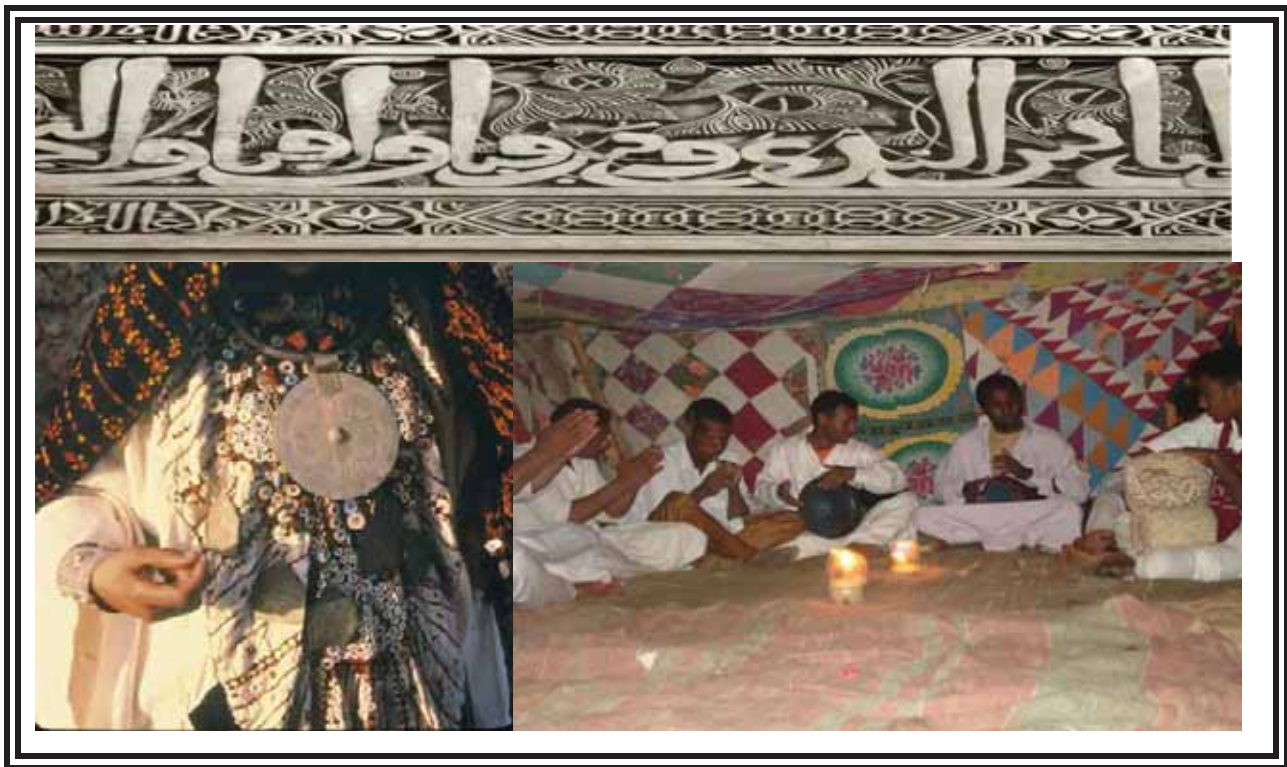


Figure 6-30 Siwa remains one of the best places to buy traditional local handicrafts.

¹ According to Nayla Refaat, Senior Civil Society/ Governance Expert in CIDA's Program Support Unit, and former consultant of Canada Fund for Local Initiative,

² Egyptian-Italian Environmental Cooperation Program. 2002. "Siwa Environmental Amelioration Project, Second Phase." Project Document, October 2002, revised, p.119.

Heritage assets: Siwa Oasis is in the western desert of Egypt that is blessed with a dense landscape of olive and palm trees, numerous natural springs and salt lakes. Historically, Siwa was an important transit route for trade caravans that wove their way through the desert from the Nile Valley in the east to the Mediterranean port of Cyrene (now in Libya) in the West. Siwa was also home to the Oracle of Amun, which led to its being a religious center for many rulers who flocked to Siwa to consult the Oracle. One renowned visitor was Alexander the Great. In 331 B.C., he visited Siwa, tempted by the fame of the Oracle. One of the mountains near Siwa, known as “Gebel Sekundre,” or “Alexander’s Mountain,” was named after Alexander the Great. Belief has it that, from this mountain, Alexander observed the ravens that guided him to the temple. Fig 6-27

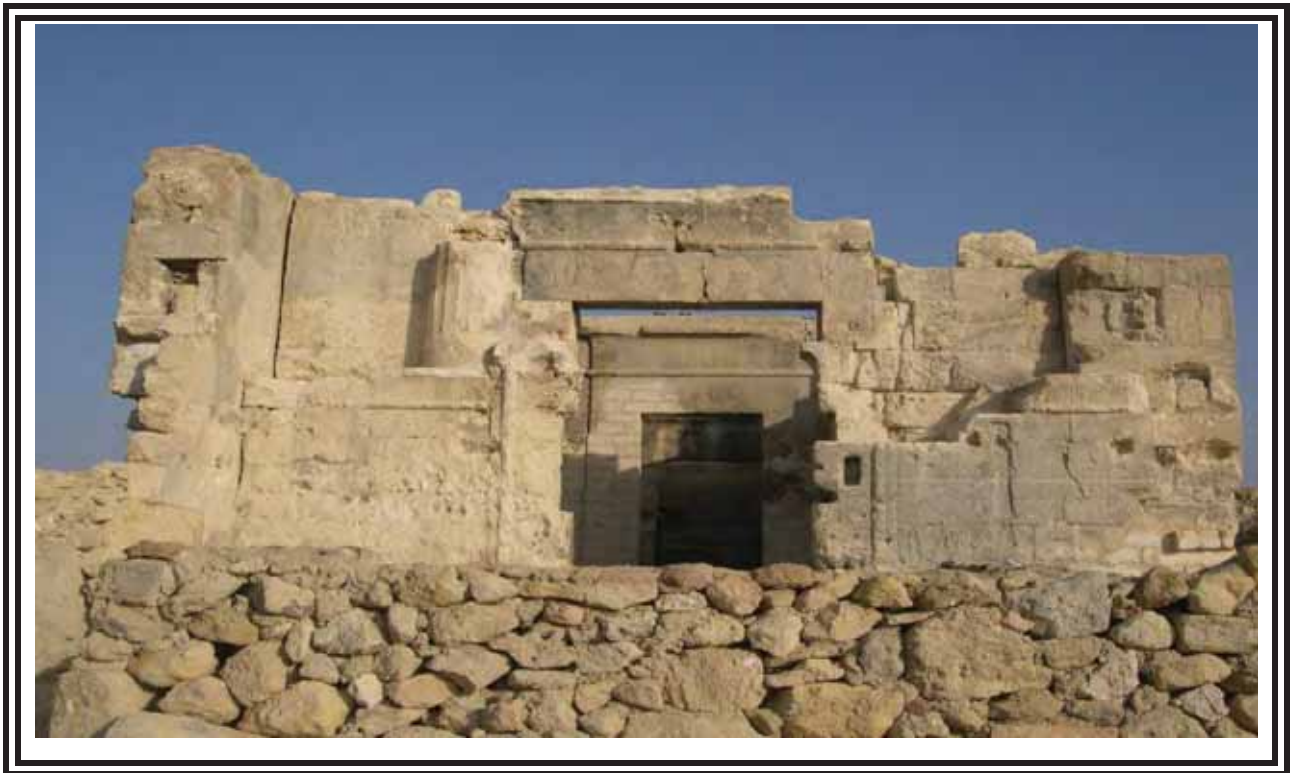


Figure 6-31 ancient temple in siwa

6.7.3 Environmental objectives

To improve air quality

By increasing the planted areas, oxygen can be obtained.

To maintain and enhance biodiversity, flora and fauna

There is no electricity in the eco-lodge; beeswax candles are used at night for lighting. The hotel staff runs the lodge with a traditionally peaceful Siwan atmosphere.¹

To minimize the production of waste

Ceilings are made of palm beams, while entrances, windows and fixtures are made of olive wood. Fig 6-28. The furniture is handmade, with traditional Siwan designs, from natural materials. Minimize the waste by reducing demolition activities.



Figure 6-32 Ceilings are made of palm beams, while entrances, windows and fixtures are made of olive wood. The goal of EQI's Renewable Energy Initiative was to provide bio-gas technology in selected villages throughout the Oasis. Organic raw elements such as animal waste are treated to produce bio-gas, as well as organic fertilizers.

To conserve soil resources and quality

Maintain and enhance soil quality through the agriculture Project.

To conserve and where appropriate enhance the historic environment

In building the eco-lodge out of kershef and demonstrating its subsequent popularity with sophisticated and worldly guests, the Siwans came to appreciate their traditional ways of building that they had previously thought were outdated and unnecessarily expensive. As a result, Siwans now proudly use more kershef than concrete in their buildings. Fig 6-29

¹ BBC. 2006. "Royals spend night in eco-hotel." 23 March 2006. URL: http://news.bbc.co.uk/2/hi/uk_news/4837106.stm.



Figure 6-33 kershef material used in building

To reduce contributions to climate change

In partnership with the International Finance Corporation (IFC), EQI initiated a bio-energy pilot project to promote awareness of reducing energy consumption and to promote the adoption of organic agriculture through the use of organic fertilizer produced by the biodigester. Reduce emissions of greenhouse gases by reducing energy consumption, most of the consumption energy is eco friendly

To maintain and enhance the quality of landscapes and townscapes

Shali Lodge, Eco-lodge, The walls of the eco-lodge were built using kershef¹, which helps in maintaining a moderate internal temperature throughout the day and which merges well with the socio-cultural and environmental context of Siwa.

6.7.4 Social objectives

Encourage a sense of community identity and welfare:

Due to geographic isolation Siwans adopted a unique tribal system that allowed leaders to rule Siwa as an independent territory. The Society Development Association, Siwa

¹ Kershef means a mixture of rock salt and mud in the Siwan language

Development Association and the Association of Cultural Preservation; All these groups helped in liaising between the Egyptian government and the Siwan leaders.

To improve the education and skills of the population overall

Improve qualifications and skills of young people; EQI regularly guides the staff with regards to environmental conservation and educates them about relevant concepts and actions. On-the-job training is offered to teach staff how to provide better guest services.

The artisan industry; Ten older women were employed to train ten younger women for a period of six months with a daily salary of 10 Egyptian pounds (US\$1.75) per day plus travel expenses. Within one year, the number of women contributing to the project increased to 300.¹

EQI, in cooperation with IFC, supports Siwan farmers through capacity building programmes on methods to grow products organically and certifying their products as organic. This allows farmers the opportunity to receive a higher-value price for their products instead of lower unfair prices that they are typically forced to accept from traders who take advantage of the farmers' need for cash. Siwan organic agricultural products are now branded and sold to the local Egyptian market, as well as to the international export markets.

To provide everybody with the opportunity to live in a decent home

Reviving the kershef building trade was also problematic as not many Siwans were skilled for the task; the Initiative has not only created more job opportunities for many Siwans, but it has also increased the number of workers who obtained training in building through kershef.

To improve health of the population overall

Adrère Amellal employees are provided with social insurance, annual and sick leaves. Any medical issues that arise are taken care of by EQI in proper health care facilities in Cairo or Matrouh.

¹ United Nations. 2001. "Economic and Social Commission for Western Asia. Sustainable Development Planning in ESCWA Member States."

Accessibility to essential services and facilities:

It was only in 1977 that Egyptian President Anwar El Sadat built several roads that allowed access from Siwa to other parts of Egypt, in an effort to open up the Oasis to the rest of the World.¹

To offer everybody the opportunity for rewarding and satisfying employment

The project's objective, in the long-term, is to encourage improved employment opportunities with a particular weight offered to women and youth. These activities have created income-generating opportunities for Siwan families who work on various aspects of the different projects such as farming, artisan crafts, furniture production and building work.

- Adrère Amellal employs about 45 community members in servicing its guests.
- Shali Lodge employs approximately 20 people from the Siwan community and creates the same spin-off benefits as the eco-lodge. The future extension of Shali Lodge will offer employment opportunities for another 15 Siwan people. It is estimated that more than 50 Siwans will be working in the building, earning wages while gaining the abilities and techniques of long-established building systems.

To reduce poverty and social exclusion

The organic agricultural Initiative provides seasonal jobs to about 30 Siwan women and men in its harvest center and benefits around 70 Siwan farmers. Several components are offered to Siwan farmers, including crop pre-financing schemes, cattle financing schemes and renewable energy initiatives that produce organic fertilizer.

EQI's packaging warehouse activity benefits Siwan farmers and provides job opportunities for women in the Oasis who are trained to carry out post-harvesting activities in accordance with organic certification requirements. At the same time, to increase Siwa's cattle wealth, EQI's Cattle- Financing Initiative will introduce 200 cows into Siwa in seven years, providing farmers with organic fertilizers and milk.

¹ Siwa Oasis. Official website. URL: www.siwaOasis_eg.com.

In support of the poor, EQI helped bring the first bank to Siwa and also built two buildings that include craft stores, a restaurant, as well as a cinema and library. The proceeds of the complex are invested into ecological management projects in Siwa. Throughout the month of Ramadan it established a space where it served meals for the local community. EQI has also worked to establish an endowment, targeting the poor with the objective of fighting poverty in the Siwa Oasis by supporting the development of small and microenterprises and the conception of more employment opportunities, accordingly.¹ Financed by the Canadian International Development Agency (CIDA), The Siwa Poverty Reduction & Enterprise Development Fund depends on pioneering financing methods founded on customary relaxed investment strategies, such as cost distribution. The Fund further provides Siwans with training and provides them with the chance to possess and run businesses that add to their knowledge and capabilities in efforts to improve their living conditions.

To improve the quality of where people live

Improve the satisfaction of people with their neighbourhoods as places to live. In addition, renewed interest in building in the Siwan tradition provides job opportunities for craftsmen. Fig6-30



Figure 6-34 the Siwan buildings historic assets

6.7.5 Economical objectives

To encourage sustained economic growth

¹ Environmental Quality International (EQI). Official website. URL: <http://eqi.com.eg/index.php?activemenu=Project%20Showcase&screenid=11>.

Improve business development and enhance competitiveness, The project has provided both workshop and home-based business prospects for more than 350 Siwan women entrepreneurs who apply their needlework skills to a line of attires, accessories, and household items.

There are two main production lines that are included in the traditional embroidery of Siwan women. The first is the production of blouses, knitwear, abbayas and galabeyas, shawls and sarongs, towels, bed linens and tablecloths. The second main production line is jewelry that is made of a variety of components including buttons, silver and embroidered leather. Fig6-30.



Figure 6-35 the traditional embroidery of Siwan women.

To reduce disparities in economic performance

Girls work at the workshop until they get married, then they work from their homes and send their finished products to the workshop with family members. The manager buys the basic fabrics, such as silk and linen, and gives it to the women to embroider. The embroidery process allows the average woman to earn 400 or more Egyptian pounds (US\$70) per month, a salary that often exceeds that of many Siwan men.¹

To encourage and accommodate both indigenous and inward investment

Adreere Amellal provides its tourists with a return-to-nature experience in an ecological and cultural context that maintains the Oasis lifestyle. The Siwan products are promoted

¹ International Finance Corporation (IFC). World Bank Group. Official website.URL: www.ifc.org/ifcext/mena.nsf/Content/PEPMENA.

and displayed in the Adrère Amellal boutique in Siwa, as well as in high-end boutiques and department stores in several European countries, such as Italy, France, and England.

To encourage efficient patterns of movement in support of economic growth

Reduce journey times between key employment areas and key transport interchanges, In 2001, Toni Scervino, a renowned Italian designer and co-founder of the Florentine haute couture enterprise in Italy, made an agreement with EQI to integrate the artistic stitchwork of the Siwan artisans into the Ermanno Scervino collection after seeing the beautiful embroidered galabayas they had made. Different parts of the garments are delivered to Cairo and from there to Siwa, where they are embroidered by Siwan women and then returned to be sewn together in Italy.¹ The Siwan garments were modeled in Milan Fashion week and received much acclaim. By 2003, Siwa's products were selling in Milan and shown in several popular fashion magazines in Italy. In Egypt, the garments are displayed in a showroom in Zamalek, an affluent residential district in Cairo.

To enhance the image of the area as a business location

Adrère Amellal also provides approximately 85 Siwans with income-generating opportunities each month in fields such as construction, maintenance, transportation, and other tourism-related roles. The organic agricultural Initiative; idea was to improve the Siwan farming techniques, develop post-harvesting processes and deliver a “product of excellence” under the Siwa brand name, to be sold in Egypt and abroad. Fig6-31.



Figure 6-36 The organic agriculture in Siwa

¹ Environmental Quality International (EQI). Official website. URL: <http://eqi.com.eg/index.php?activemenu=Project%20Showcase&screenid=11>.

To improve the social and environmental performance of the economy

The goal of EQI's Renewable Energy Initiative's aim is the replacement of butane fuel that is imported from Marsa Matrouh, a town that is a three-hour drive away from Siwa. To achieve this, 25 biodigesters will be installed. High-quality organic fertilizer is produced as a byproduct of this process, which further contributes to increasing household income.¹

6.8 ESNA City Developments

Project Information

Owner: Governorate of Luxor & GOPP. Ministry of Housing.

Project Area: 26 Feddan.

Main Consultant: CUBE Consultants, Cairo- Egypt 2010.



Figure 6-37 Esna City View the minaret and the temple

6.8.1 Project Background

The project aimed to develop Esna city via exploiting its special location and create tourists attractions which leads to increasing employment opportunities, initiating to higher rates of quality of life for inhabitants. Taking into consideration that such

¹ Environmental Quality International (EQI). Official website. URL: <http://eqi.com.eg/index.php?activemenu=Project%20Showcase&screenid=11>.

development procedures will be environment-friendly. In order to respond to these trends, the Ministry of Housing, General Organization of Physical Planning and Luxor Governorate had nominated our firm to participate in such development plan in 2010, for the study of a Comprehensive Development Plan for the City of Esna The Structure Plan, Heritage Plan and Investment Projects produced as components of the project address ways to accommodate the projected growth in population, tourism and agriculture, while preserving and enhancing the antiquities. The objective of the project is to establish and accomplish a work plan for environmentally sustainable tourism development that also benefits the local population.

6.8.2 Baseline Information

Historic Environment

In Upper Egypt, along the west bank of Nile River, where Esna is located at 55 km south of LUXOR city. Esna is a city that demonstrates how archaeological layers build up over time; it is a homeland of treasures of world renowned Greek – Roman monuments. From ancient Egyptian to Greek – Roman era, followed by Fatimid era, then Ottoman and finally the era of Mohamed Ali pasha. They represent some of the finest examples of mankind's early civilization and it is ranked among its greatest cultural achievements. This unique cultural heritage continues to attract visitors from all over the world in ever-growing numbers.

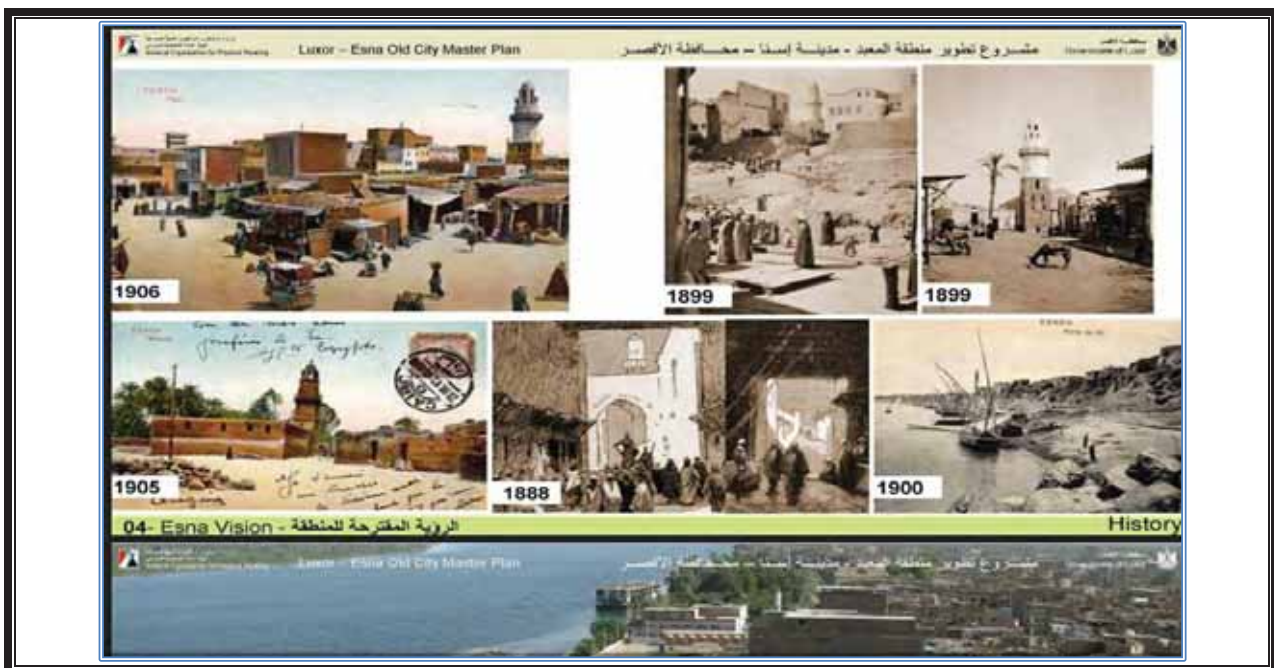


Figure 6-38 Esna historic Assets.

Heritage assets

Esna today is somehow a trade and farming town, with a weaving industry, it suffers from severe dreadful conditions of the physical environment and basic services for inhabitants. Furthermore, the high level of subterranean water at Esna was caused by the construction of the Esna barrages, which raise water levels behind them. The water has slightly affected the walls and foundation of the khnum temple which belong to the Greek – Roman era. Because of the ground level of the city of Esna which is nine meters higher than the level of the temple, the absence of a drainage system in the city had also added to the rising subterranean water level.

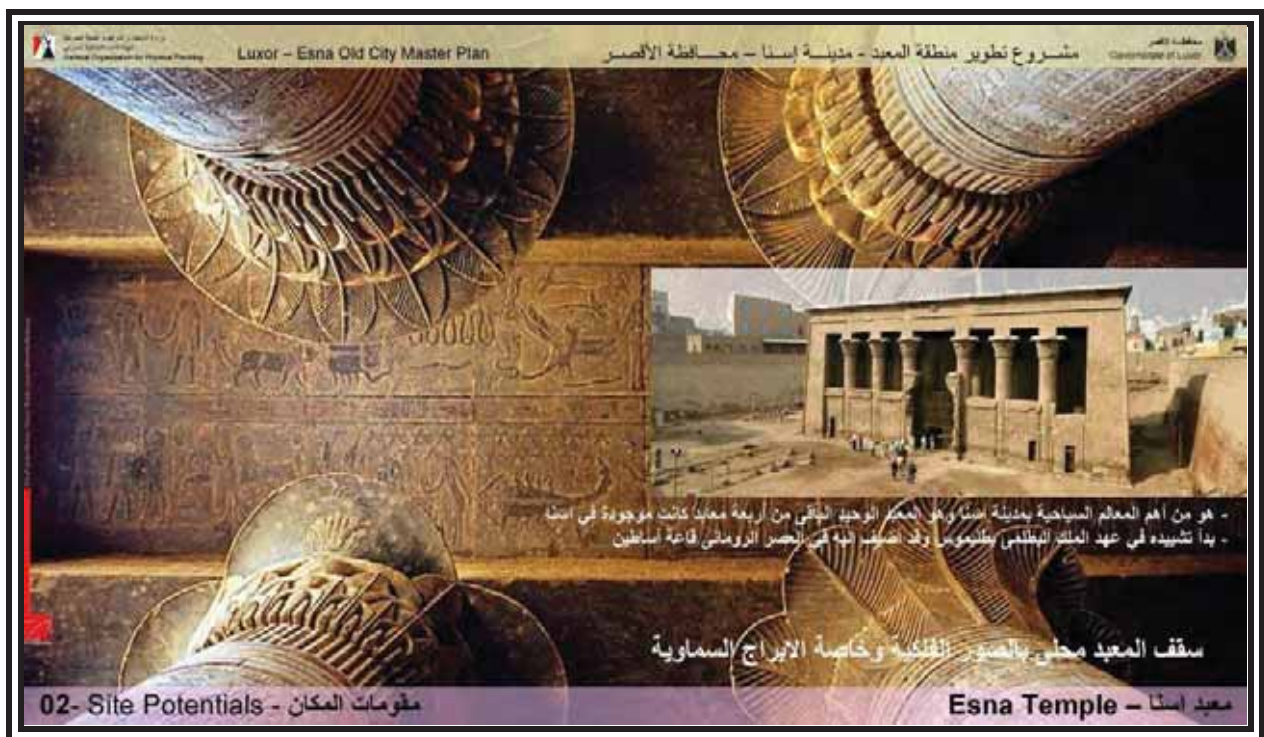


Figure 6-39 Esna Temple ceiling

6.8.3 Environmental objectives

To reduce the effect of traffic on the environment

Reduce traffic volumes, reduce the effect of heavy goods traffic on people and the environment, and Increase the proportion of journeys using modes other than the car. .

Oasis is mainly established for walkers only (certain time for services cars).



Figure 6-40 Esna development will be no Traffic inside.

Protect, enhance and manage the rich diversity of the historic environment

Luxor – Esna Old City Master Plan

مشروع تطوير منطقة المعبد - مدينة إسنا - محافظة الأقصر

أهداف الرؤية العمرانية للمنتطقة التراثية:
واحة إسنا التراثية – إحياء المدينة القديمة

(واحة صديقة للبيئة و الإنسان)
Eco City

التشويق العمراني للواحة

1. تسييج وطابع عمراني ثقافي منظم يمزج بين التسييج العمراني الأصلي والطرق والمحتدات المؤدية الى متسوب المعبد
2. مراعاة إتجاه الرياح في تصميم الممرات و الطرق
3. الوصول لأعلى نسبة تظليل بالواحة (فرق الارتفاعات، استخدام الأشجار ، المعظلات الخشبية و التسييجية)
4. استخدام الطاقة الشمسية في إتارة الممرات و الساحات
5. معالجة مياه الصرف و استخدامها في شبكات الري و حنفيات إطفاء الحريق و شبكة غسيل ممرات الحركة.
6. استخدام مواد طبيعية من البيئة في أعمال تشويق الواحة (احجار و خامات طبيعية ، زراعات و أشجار)
7. توفير بيئة عمرانية تعمل على إظهار المعاني الأثرية بعمل الساحات الثقافية الترفيهية حولها
8. استخدام أحدث النظم في عمل شبكات البنية التحتية (كهرباء ، مياه، صرف صحي ، إطفاء حريق، ري ، غسيل الممرات و الساحات، شبكات الاتصالات و المعلومات، شبكات كابلات الدش....)

05- Master plan analysis - المخطط العام المقترح

Figure 6-41

To reduce vulnerability to climate change

1. The use of natural, friendly- environment building materials. Use of solar energy
2. Using scientific method to get rid of wastes.
3. Increasing the green areas to be the lungs for inhabitants.
4. Natural ventilation in buildings with courtyards.
5. Harmony philosophy use of natural heritage colors for the oasis.
6. Oasis is mainly established for walkers only (certain time for services cars).
7. Safety design for buildings construction using bricks, stones and wood.

8. Compatibility with the historical and traditional nature of people.
9. Applying the latest advanced technology in the infrastructure networks design.
10. (Water - drainage - electricity - rain drainage- Satellite Cables - Information and communication network – Fire station.



Figure 6-42

6.8.4 Economic objectives

- 1- Preservation of cultural resources protects Egypt's heritage and promotes economic development.
- 2- Planned growth promotes sustainable economic development.
- 3- Meeting the contemporary needs of local residents is vital to the success of plans.

6.8.5 Social objectives:

1. The creation of the core of Esna City as a Heritage District, preserving, and improving the historical buildings in the City's old sections.
2. The development of a tourism zone in the core of the City and make facilities for other tourist activities.
3. The creation of a planned new community.
4. Divide the city into a range of sectors. Each sector contains a homogeneous region or more at the areas of the city (they have the same physical, economic and social characteristics).
5. Optimize the interface of the Nile to the city
6. Improve the connectivity of the city by relying on the river transport within the city between Luxor and Aswan (locating the city on the map of Nile cruises). As well as

improving the internal road network through the transfer of regional transit traffic outside the city to organize the work of internal road network.

6.9 Conclusions about the Role and Importance of Egyptian Historic Environment

Egypt historic environment may be valued in a variety of ways, from the aesthetic and emotional pleasure gained from experiencing historic sites, through the role of these assets as a contributor to quality of life and sense of cultural identify. The economic value of the historic environment may be most readily apparent in terms of the role of heritage assets as generators of revenue and job creation. More widely, Egypt's historic environment is a critical contributor to sustainable economic growth, and to the creation of attractive communities that are places where people want to live, work, visit and invest. Unquestionably, heritage represents a valuable national asset, and one which is fundamental to Egypt's core values and principles as a nation.

There is a compelling justification for public intervention and investment in Egypt's historic environment on economic grounds. This rationale for public intervention is based upon the correction of market failure owing to its 'public good' characteristics, and the range of positive benefits attributable to the historic environment which are not fully reflected in market transactions. Nevertheless, and notwithstanding an emerging body of international research evidence, the nature and importance of Egypt's heritage 'sector' is far from fully appreciated and often poorly understood. In part, this is a reflection of the complexities connected to accurately defining and delimiting the sector and with attempting to place economic value on categorization of activity that does not fit neatly into traditional economic classifications.

The operational definition for Egypt's historical environment utilized in this study aligns to the remit and coverage of those principal organizations active in conserving, maintaining, managing and/ or providing access to the nation's historic environment assets and sites, whilst also reflecting a practical requirement for credible data coverage and availability. Whilst acknowledging the degree of – mutually beneficial – interdependency with both the natural environment and cultural domains, we have taken care to specify as far as possible distinctive historic environment elements within the broader 'heritage' outline. And the following concluded table is for the sustainable objectives concerning culture heritage projects. Table 6-1

Table 6-1 Culture Heritage Conservation sustainable objectives

Target	Main objective	Sub Objective
Sustainable Conservation objectives	Environmental (E)	Reduce The Effect Of Traffic On The Environment
		Protect, Enhance And Manage The Rich Diversity Of The Historic Environment
		Improve Water Quality
		Improve Air Quality
		Maintain And Enhance Biodiversity, Flora And Fauna
		Reduce Vulnerability To Climate Change
		Provide For Sustainable Sources Of Water Supply
		Minimize The Production Of Waste
		Minimize The Waste By Reducing Demolition Activities
		Conserve Soil Resources And Quality
		Achieving High Quality And Sustainable Design For Buildings, Spaces And The Public Realm Sensitive To Locality
	Social (S)	Encourage A Sense Of Community Identity And Welfare
		Reduce Anti-Social Activity
		Improve The Education And Skills Of The Population Overall
		Provide Everybody With The Opportunity To Live In A Decent Home
		Improve Health Of The Population Overall
		Accessibility To Essential Services And Facilities
		Offer Everybody The Opportunity For Rewarding And Satisfying Employment
		Reduce Poverty And Social Exclusion
		Improve The Quality Of Where People Live
		Improve Accessibility For Those Most In Need
	Economic (EC)	Encourage Sustained Economic Growth
		Reduce Disparities In Economic Performance
		Encourage And Accommodate Both Indigenous And Inward Investment
		Encourage Efficient Patterns Of Movement In Support Of Economic Growth
		Enhance The Image Of The Area As A Business Location
		Improve The Social And Environmental Performance Of The Economy

Part III

Chapter 7 - SIA Framework for Cultural Heritage Conservation

- 7.1 Introduction
- 7.2 Defining the Historic Environment
- 7.3 Sustainability Impact Assessment Framework
- 7.4 Screening
- 7.5 Scoping
 - 7.5.1 SIA Objectives
 - 7.5.2 Decision-Making criteria
 - 7.5.3 Decision-making Indicators
- 7.6 Sustainability Report
- 7.7 Recommendations and Mitigation
- 7.8 Conclusions

7.1 Introduction

Heritage conservation is committed to the principles of sustainable development, which help people to understand value, care for and enjoy their historic environment. Heritage conservation promotes a wide definition of the historic environment covering not only areas, buildings and features with statutory protection but also those parts of the environment which are locally valued and important and the historic character of the landscape and townscape. The historic environment is more than an environmental and cultural asset; it is an important driver for economic development and delivering social objectives. The historic environment contributes positively to all aspects of sustainable development, as mentioned before. This chapter will collect previous Chapters conclusions in order to reach the proposed approach and sets out a Sustainable Impact Assessment frame work for culture heritage projects which occur at three stages: Screening, Scoping & Reporting. The overall aim of the SIA process is to provide a high level of protection for the historic environment; to avoid or minimize any adverse effects; to maximize potential benefits; and to ensure that appropriate mitigation, enhancement and monitoring are identified for delivery at the implementation stage.

7.2 Defining the Historic Environment

Historic environment has been defined for the purposes of impact assessment as comprising built heritage assets – those which are statutorily protected, together with components of the broader built heritage. The frame work will consider how the assets are conserved and how they link to other sectors of economic activity. Notably, the study has purposely considered those assets which may be more closely associated with the natural environment (such as National Parks), and those assets which more closely correspond to the cultural environment.

7.3 Sustainability Impact Assessment Framework

The sustainability impact assessment framework sets out the objectives (sub-objectives), decision-making criteria and indicators to be used in undertaking the assessment. The application of the framework to the assessment of the historic environment is based on stages. Where it is proposed to use a Panel to review the framework and undertake the appraisal it is important for historic environment interests to be covered through the inclusion of a heritage representative on the Panel. Fig 7-1.

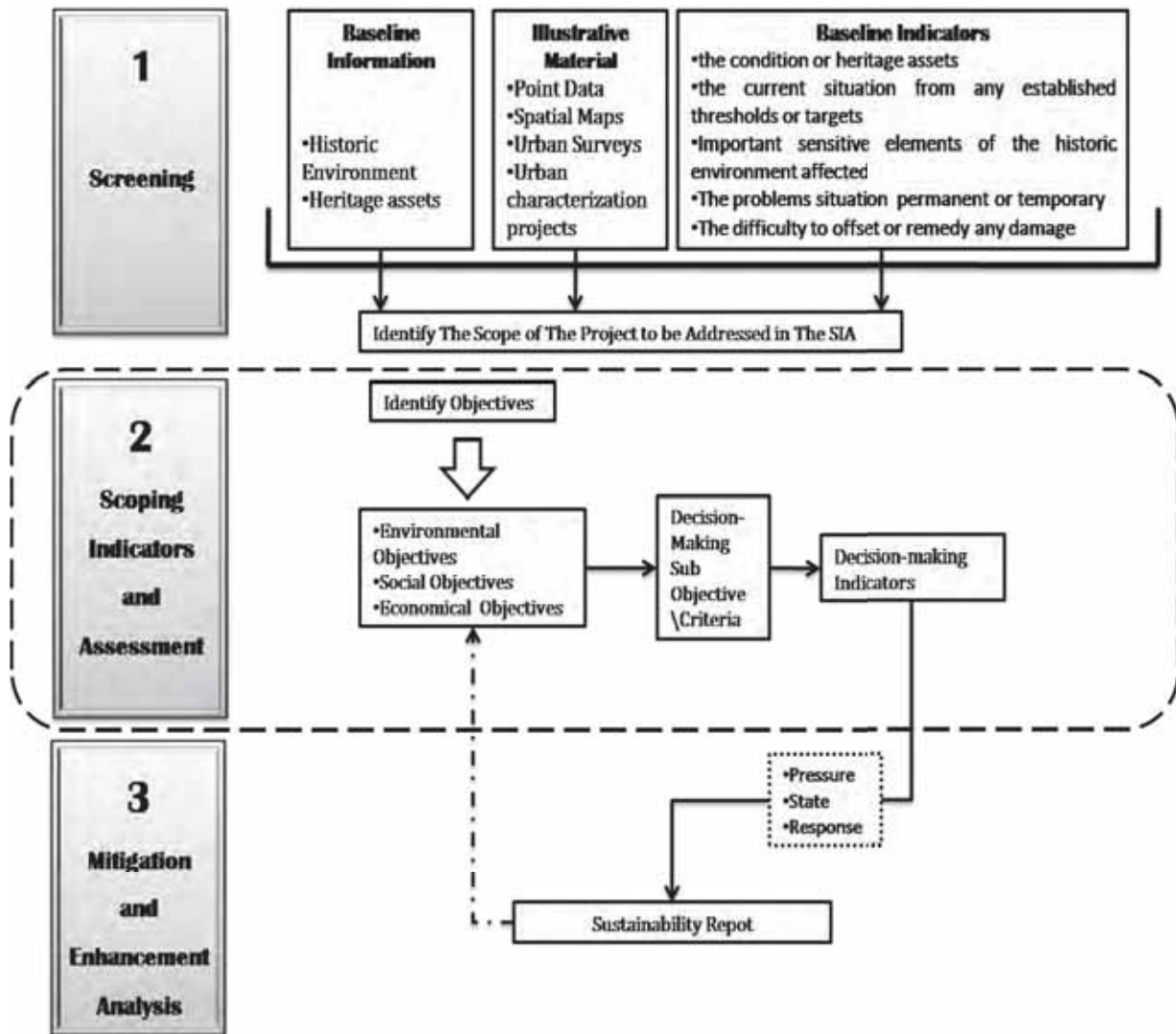


Figure 7-1 Impact Assessment System

7.4 Screening

This is the process that identifies the source or origins of impacts, in other words which are the stressors of the project. It also determines if a project, because of its nature and/or size, requires an SIA.

7.4.1 Baseline Information

It recommends that the baseline information should describe the current and future likely state of the historic environment, providing the basis for identifying sustainability issues, predicting and monitoring effects and alternative ways of dealing with them. It can use both quantitative and qualitative information, and needs to be kept up-to-date. The information needs to be tailored to the scale; type and topic of the development conservation plan document or other relevant plan. There may also be a need to look at

the wider geographic area in order to assess the likely significant environmental effects (e.g. traffic generation, setting issues).

Not all information may be available immediately and so any gaps in information on the historic environment will need to be highlighted as part of the baseline description. The establishment of a robust and comprehensive baseline will also assist in the later testing of the soundness of conservation plan documents. Ways of improving the availability of information can be included in proposals for monitoring the implementation of the plan. It is important that meaningful conclusions can be drawn from the baseline information; what it means for the plan and how the historic environment is to be dealt with.

When arranging baseline information it is important that the historic environment is broadly defined. All designated historic assets are considered together with non-designated features of local historic or architectural interest and value since these can make an important contribution to creating a sense of place and local identity. This covers buildings, and other structures and features, archaeological remains, historic open spaces and the wider historic landscape or townscape.

7.4.2 Illustrative Material

It is not easy to represent the historic environment spatially in a holistic way. Point data alone from individual designations does not provide an adequate overview. Fig7-2

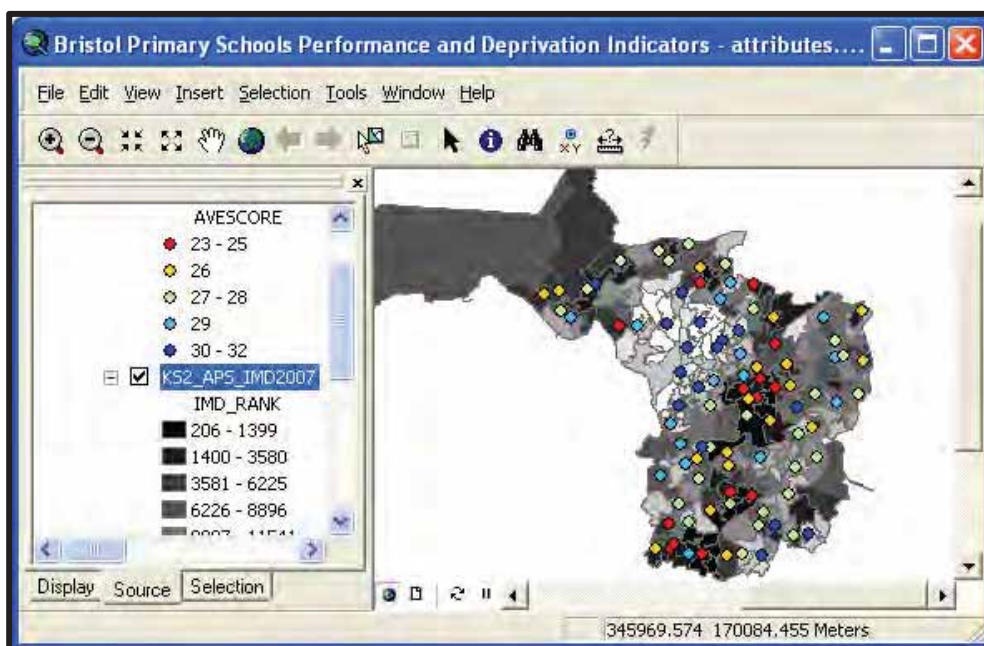


Figure 7-2 Point data map in GIS software

Source: URL: http://www.restore.ac.uk/geo-refer/images/map_point_data_aps+imdrank.png

Historic characterization can supplement this, broadening the understanding of the historic environment by describing the evolution of the present day landscape / townscape and identifying its surviving historic character. Through this process, an understanding about what gives a place its distinctive character and sense of place can be gained. Fig8-3. Data is available from the county/unitary Historic Landscape Characterization projects, Intensive and Extensive Urban Surveys and other urban characterization projects which must include.¹

- Which parts of the region/district are rich in heritage assets? (including visitor attractions)
- Are these heritage assets at risk from damage or neglect?
- Which areas have been designated because of their historic or landscape quality (World Heritage Sites, National Parks,)?
- What other non-designated heritage assets are important such as views and vistas?
- Has the landscape and townscape character of the plan area been defined, if so, what are its distinctive features?
- Is the distinctive character of the area under threat, if so, how?
- Which locations should be conserved, restored or enhanced?



Figure 7-3 the state of project after and before development and conservation

¹ Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents, ODPM 2005 p90.

When analyzing the baseline data on the historic environment, it is useful to identify relevant comparators and targets. These can be informed by the plan review and drawn from national, regional and local data sets, such as the Heritage at Risk Register.

7.4.3 Baseline Indicators

The selection of indicators for the historic environment may vary at different stages of the appraisal process and in relation to the particular development conservation plan document. State of the environment or contextual indicators can inform the baseline analysis, such as looking at the comparative range, quality and condition of historic assets and identifying possible targets. However, state of the environment indicators may not always be suitable for the appraisal or monitoring the significant effects of a plan. At these stages the priority is to devise indicators which will clearly demonstrate the impacts of the plan on the historic environment.

For each baseline indicator enough information is needed to answer the following questions:¹

- How good or bad is the condition or quality of heritage assets and places? Do trends show that it is getting better or worse?
- How far is the current situation from any established thresholds or targets?
- Are particularly sensitive or important elements of the historic environment affected?
- Are the problems reversible or irreversible, permanent or temporary?
- How difficult would it be to offset or remedy any damage?
- Have there been significant cumulative or synergistic effects over time? Are there expected to be such effects in the future?

7.4.4 Scope

The scope of the project to be addressed in the SIA process including:

- Conserving the Culture heritage of the area.
- Environmental capacity issues.
- Preserving and enhancing the historic environment resource.

¹ Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents, 2005 paragraph 3.2.9

7.5 Scoping

Scoping identifies the most important impacts caused by the project. This stage is perhaps one of the most difficult since it has to make an inventory of issues that can be affected by the project. Scoping looks in the past, the present and the future, in relation to elements that are connected with the project to be developed. It also determines the alternatives, criteria to be considered, mitigation measures and residual impacts. Usually indicators are incorporated to analyze and measure the impacts. Fig 7-4. The studies or analyses that have been performed prior to the present moment are not included here. It rather applies to the determination of the cumulative effects created by the elements intervening in the project.

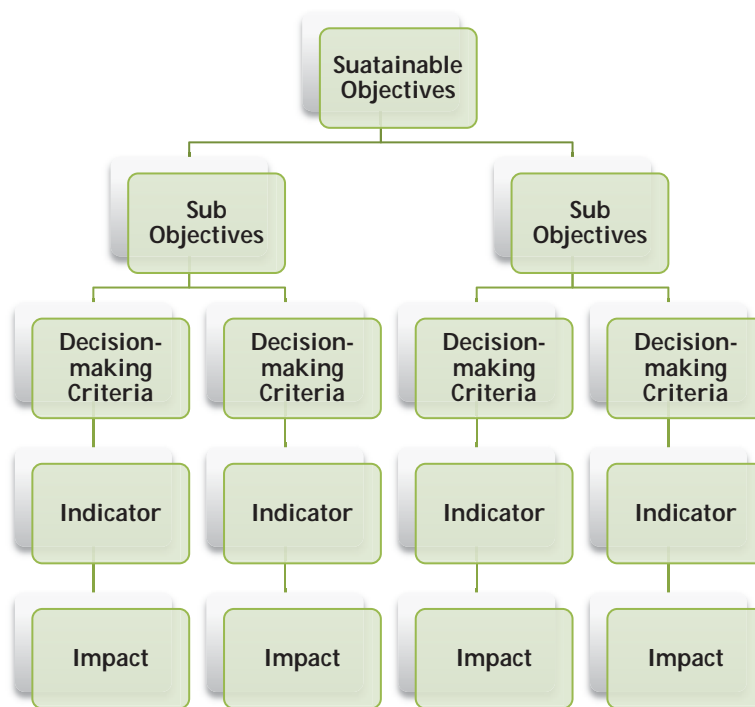


Figure 7-4 The Scoping Stage hierarchy of Data and Evaluation.

7.5.1 SIA Objectives

Whilst a specific objective for the conservation and enhancement of the historic environment will always be necessary, it may also be appropriate to take into account the historic environment under other objectives such as those covering regeneration, tourism, access to services, quality of life, landscape and townscape. A sustainable outcome is better achieved by an integrated approach. Recognizing that the number of objectives needs to be manageable, the list below presents a selection of objectives which can be tailored to local authority circumstances and the level and subject of the plan under

consideration. These are broad objectives; where a plan or document deals with a particular topic the objectives will be more specific. The list is divided into environmental, social and economic groups and includes sub objectives which may be applicable to other themes such as landscape and townscape. Chapter6 sets in details the environmental, social and economic objectives and a range of relevant sub objectives.

7.5.2 Decision-Making criteria

These are detailed decision-making criteria and related indicators in the SIA framework; it can help to ensure that all the key issues to be considered in the SIA are incorporated in the assessment framework. It is important to include separate decision-making criteria for the historic environment, in order that the identification of likely effects upon the historic environment is not masked. Tables 7-1, 7-2, 7-3 sets in details the environmental, social and economic criteria recommended in the following points to support objectives. A range of relevant decision-making criteria were selected in to support of the main objective for the conservation of historic environment.¹

Table 7-1 Environmental Sub Objectives and Decision-Making Criteria

Environmental Sub objectives		Decision-Making criteria
E1	To improve air quality	Improve air quality
E2	To improve water Quality	Improve the quality of inland water
		Improve the quality of coastal waters
E3	To conserve soil resources and quality	Minimize the loss of soils to development
		Maintain and enhance soil quality
E4	To minimize the production of waste	Lead to reduced consumption of materials and resources
		Reduce household waste
		Increase waste recovery and recycling
		Reduce hazardous waste
E5	To reduce contributions to climate change	Reduce waste in the construction industry
		Reduce emissions of greenhouse gases by reducing energy consumption
		Lead to an increased proportion of energy needs being met from renewable sources
E6	To reduce vulnerability to climate change	Reduce emissions of ozone depleting substances
		Minimize the risk of flooding from rivers and watercourses to people and property

¹ Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents, 2005

Environmental Sub objectives		Decision-Making criteria
		Minimize the risk of flooding to people and properties on the coast
		Reduce the risk of subsidence
		Reduce the risk of damage to property from storm events
E7	To reduce the effect of traffic on the environment	Reduce traffic volumes
		Reduce the need for overseas travel
		Reduce the effect of heavy goods traffic on people and the environment
		Increase the proportion of journeys using modes other than the car
E8	To maintain and enhance biodiversity, flora and fauna	Conserve and enhance natural/semi-natural habitats
		Conserve and enhance species diversity, and in particular avoid harm to protected species
		Maintain and enhance sites designated for their nature conservation interest
		Maintain and enhance woodland cover and management
E9	To provide for sustainable sources of water supply	Reduce water consumption
E10	To conserve and where appropriate enhance the historic environment	Protect and enhance sites, features and areas of historical, archaeological and cultural value in both urban and rural areas
		Minimize the waste by reducing demolition activities
		Achieving high quality and sustainable design for buildings, spaces and the public realm sensitive to locality
E11	To maintain and enhance the quality of landscapes and townscapes	Reduce the amount of derelict, degraded and underused land
		Improve the landscape and ecological quality and character of the countryside
		Decrease litter in towns and the countryside
		Protect, enhance and manage the character and appearance of the landscape including townscape, maintaining and strengthening local distinctiveness and sense of place.

Table 7-2 Social Sub Objectives and Decision-Making Criteria

Social Sub Objective		Social Decision-Making criteria
S1	Encourage a sense of community identity and welfare	Encourage engagement in community activities
		Increase the ability of people to influence decisions
		Improve ethnic relations
S2	To reduce anti-social activity	Reduce actual levels of crime
		Reduce the fear of crime
		Reduce actual noise levels
		Reduce noise concerns
S3	To improve the education and skills of the population overall	Improve qualifications and skills of young people
		Improve qualifications and skills of adults
		Qualifications of young people
S4	To provide everybody with the opportunity to live in a decent home	Reduce homelessness
		Increase the range and affordability of housing for all social groups
		Reduce the number on unfit homes
S5	To improve health of the population overall	Reduce death rates
		Improve access to high quality, health facilities
		Encourage healthy lifestyles
		Reduce health inequalities
S6	accessibility to essential services and facilities	Improve accessibility to key local services
		Improve accessibility to shopping facilities
		Improve the level of investment in key community services
S7	To offer everybody the opportunity for rewarding and satisfying employment	Reduce unemployment overall
		Reduce long-term unemployment
		Provide job opportunities for those most in need of employment
		Help to reduce long hours worked
		Help to improve earnings
S8	To reduce poverty and social exclusion	Reduce poverty and social exclusion in those areas most affected
		Improve affordability to essential services to the home

Social Sub Objective		Social Decision-Making criteria
S9	To improve the quality of where people live	Indicators of success in tackling poverty and social exclusion (children in low income households, adults without qualifications and in workless households, elderly in fuel poverty)
		Improve the satisfaction of people with their neighbourhoods as places to live
S10	To improve accessibility for those most in need	Make access more affordable
		Make access easier for those without access to a car

Table 7-3 Economic Sub Objectives and Decision-Making Criteria

Economic Sub Objectives		Economic Decision-Making criteria
EC1	To encourage sustained economic growth	Improve business development and enhance competitiveness
		Improve the resilience of business and the economy
		Promote growth in key sectors
		Promote growth in key clusters
EC2	To reduce disparities in economic performance	Improve economic performance in advantaged and disadvantaged areas
		Encourage rural diversification
EC3	To encourage and accommodate both indigenous and inward investment	Encourage indigenous business
		Encourage inward investment
		Make land and property available for business development
EC4	To encourage efficient patterns of movement in support of economic growth	Reduce commuting
		Improve accessibility to work by public transport, walking and cycling
		Reduce the effect of traffic congestion on the economy
		Reduce journey times between key employment areas and key transport interchanges
		Facilitate efficiency in freight distribution
EC5	To enhance the image of the area as a business location	Attract new investment and additional skilled workers to the area
EC6	To improve the social and environmental performance of the economy	Encourage ethical trading
		Encourage good employee relations and management practices

7.5.3 Decision-making Indicators

Decision-making indicators are measures of Conservation project impacts, outcomes, outputs, and inputs that are monitored during project implementation to assess progress toward project objectives. They are also used later to evaluate a project's success. Indicators organize information in a way that clarifies the relationships between a project's impacts, outcomes, outputs, and inputs and help to identify problems along the way that can impede the achievement of project objective.¹ Decision-making indicators for the appraisal or monitoring of the significant effects are always related to accompanying the objectives and decision-making criteria.² Fig7-5. Where the following points in indicators should be considered;

- The indicators are appropriate and relevant to the level and subject of the project evaluated;
- The indicators address positive and negative effects;
- Use is made of both qualitative and quantitative data;
- The indicators are kept under review as new data sets become available and or new issues are identified; and Accompanying targets are included.

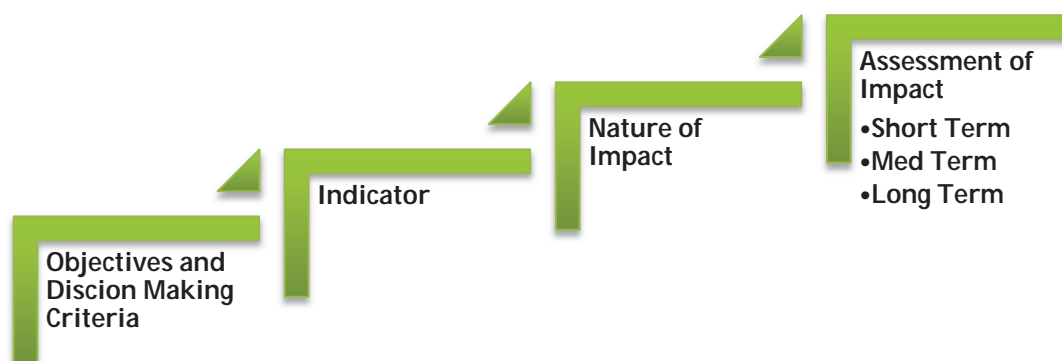


Figure 7-5 The Assessment Process in Scoping Stage

Selecting indicators which are directly linked to SIA objectives is a complex process which is increased in respect of the historic environment by the relative lack of consistently monitored data when compared to other topic areas. A strong monitoring

¹ Roberto Mosse and Leigh Ellen Sontheimer, Performance monitoring indicators handbook / World Bank technical paper ; no. 334-1996.

² Sustainable Development Indicators

framework for the historic environment must be included to meet the requirements of SIA in terms of:

- Identifying any unforeseen adverse effects of implementing the plan and enabling appropriate remedial action to be taken;
- Testing the accuracy of predictions made in the SIA and improving future practice;
- Checking the delivery and performance of mitigation measures;
- Determining whether the plan is contributing to the achievement of the objectives and targets for the historic environment;

The following Tables explain the overall suggested table for the Screening stage for any conservation project

Table 7-4 suggested table for the Screening stage for any conservation project

7.6 Sustainability Report

The purpose of this section is to provide advice on the appraisal of the plan and options, and on the presentation of recommendations and mitigation measures in Sustainability Report. This report will determine and justify at the scoping stage which plan /alternative will have less adverse effects on cultural heritage. It is recommended that the appraisal be an iterative process, addressing the sustainability issues identified in the Scoping Report to inform the development of the plan. Identification and prediction of potential significant effects (positive and negative) on the historic environment can involve the following general categories:

- Loss or damage to any heritage asset and/or its setting;
- Conservation and enhancement of any heritage asset;
- Loss, or erosion, of the historic character of the landscape/townscape;
- Impact on the 'at risk' status of assets, as well as wider level of risk to the historic environment;
- Impacts in the wider area, such as trans-boundary effects (e.g. traffic generation, setting issues);
- Cumulative impacts on heritage assets and places. Cumulative impacts can occur in three different ways, although these are not mutually exclusive:
 - Spatial – accumulation of impacts in different places;
 - Temporal – accumulation of impacts at one location over time;
 - Simultaneous – accumulation of impacts at one location simultaneously.

7.7 Recommendations and Mitigation

The sustainable report develops the identification and assessment of significant effects into recommendations for modifications to the plan. It is also advisable for the evaluation and selection of options to be explained in the report. Mitigation measures that are appropriate to the level of impact and type of harm involved may need to be identified if the avoidance of harm is not possible. The primary objective of SA is the avoidance of harm, with the highest level of protection being afforded to internationally and nationally important historic assets, although other historic assets are also irreplaceable and consequently avoidance of damage to these is also highly desirable. Mitigation measures to be implemented when proposals come forward are the most appropriate method of

dealing with situations where damage cannot be avoided. Compensation measures are not usually appropriate, as historic assets cannot be re-created (although it is possible to restore, for example an historic park and garden to reflect its original design and planting.). The Sustainability Report should include:

- Describe mitigation measures to prevent, reduce or offset significant adverse effects, and also recommendations for improving beneficial effects. These, together with other key recommendations for the modification of a plan or programme, should be clearly set out in the main body of the sustainable report and in the Non-Technical Summary.
- Indicate the likely effectiveness of the mitigation measures;
- Identify strategic mitigation rather than being too detailed and overly prescriptive, but vague, generalized statements should be avoided. The level of specificity in terms of mitigation will depend on the level of the plan being assessed, e.g. for an Area Action Plan it might be appropriate for the report to propose quite detailed mitigation proposals to offset any adverse impacts that cannot be avoided or to promote measures that would benefit the historic environment;
- Consider the need for exceptional measures;
- Consider remote compensation. This option is rarely appropriate for the historic environment because of its site specific and infinite nature. If it can be achieved, it should only be employed as a last resort;
- Cascade requirements to projects, where relevant. Mitigation measures should be picked up in EIA for qualifying projects and be incorporated into design/planning briefs;
- Identify responsibility for, commitment, and mechanisms for, delivering mitigation as an integral part of the monitoring process. Examples of possible mitigation measures for the historic environment might include:
 - Describe mitigation measures to prevent, reduce or offset significant effects, and also recommendations for improving beneficial effects;
 - Set these out, together with other key recommendations for the modification of a plan or programme, clearly in the main body of the Environmental Report and in the Non-Technical Summary rather than in the appendices;

- Strengthened references to the historic environment in the policy framework, criteria and guidance e.g. addition of a specific historic environment policy, regeneration policies, planning obligations, SPD guidance;
- Preparation of detailed historic environment policy guidance e.g. SPD, design guides;
- Undertaking of detailed historic characterization studies to inform development;
- Historic environment requirements (e.g. archaeological provisions) for project EIAs;
- Use of Article for Directions to protect the character of conservation areas;
- In very exceptional circumstances the dismantling and reconstruction of a building may be justified (remote compensation), although this might be identified at the strategic level of the plan, it is more likely to be dealt with at the project level.
- It is also recommended that the Environmental/Sustainability Report:
 - Record how the plan changes in response to the SEA/SA;
 - Clearly identify where recommendations of the SEA/SA have not been incorporated in the plan, together with an explanation of why not.
 - Set out how comments at earlier stages on the treatment of the historic environment in the appraisal process have been taken into account.

7.8 Conclusions

The Sustainability Appraisal Framework, particularly the indicators, provides the basis for monitoring a SIA. However, as indicated above, the delivery of mitigation measures is monitored and further, that SIA monitoring is an integral part of the Annual Monitoring Report for Conservation projects. Setting out the sustainable conservation objectives and sub objectives for culture heritage conservation projects can guide the improvement of historic environment or not, it is the criteria when comparing conservation alternatives with each other as an integral part in the Scoping stage for the suggested framework. The next chapter will focus on the sustainable objectives concerning culture heritage projects and then find the criteria weight for each sub objective.

Chapter8- Sustainable Cultural Heritage Criteria and Indicators

- 8.1 Introduction
- 8.2 Applied study Hypothesis
- 8.3 Applied study limitations
- 8.4 Applied Study Methodology
- 8.5 Conclusions

8.1 Introduction

While developing Culture Heritage; conservation must be involved in the assessment of the Development Plan Documents and other relevant plans. They are best placed to provide information and advice on: local historic environment issues and priorities; how a policy or proposal can be tailored to avoid or minimize potential adverse impacts on the historic environment; the nature and design of any required mitigation measures; and opportunities for securing wider benefits for the future conservation and management of historic assets. According to the suggested frame work in the previous chapter, this chapter sets out the Sustainable objectives which are built upon case studies analysis and on a detailed survey, related to culture heritage projects. The study's findings result from field surveys; will be applied in the next Chapter in the SIA framework. The chapter will choose a case studies in different culture heritage sites in Egypt mentioned in detail in the end of chapter6, the research will try to regenerate the sustainable objectives and sub objectives of these kind of projects, which it will be introduce to selected group of public users and professionals to evaluate these objectives, in order to test the research approach, then analyzing their opinions to choose the optimum sub criteria weigh and finding the relation between the three main objectives of Sustainable conservation for culture heritage Projects.

8.2 Applied study Hypothesis

- The ideological Hypothesis is that the culture heritage sites in Egypt should be conserved with a sustainable perspective similar to situations in many culture heritage sites around the world. However, understanding people's perception of the conservation objectives should shed light upon desirable types of changes to be made along the conservation plan.
- General public's participation through evaluation of conservation objectives and sub objectives is a clear effective affirmation of public priorities leading to a certain situation for conservation program and plan.

8.3 Applied study limitations

- The applied study will not examine general public participation in all conservation stages, but it will test public evaluation of what are the impacts after conservation stage.

- The applied study will be limited to the objectives fulfilled and evaluated on existing conserved projects.
- The applied study will not test public evaluation for all culture Heritage projects all over the world but will test it on different culture heritage sites in Egypt which represent the Egyptian personality (mentioned in chapter6).

8.4 Applied Study Methodology

The applied study methodology is a process that requires more of the analyst than simple familiarity and proficiency with statistical software tools. It requires a deeper understanding of the sample design, the survey data, and the interpretation of the results of the statistical methods. By following a more general outline for applied statistical analysis¹. Fig8-1 outlines a sequence of five steps that are fundamental to applied survey data analysis.

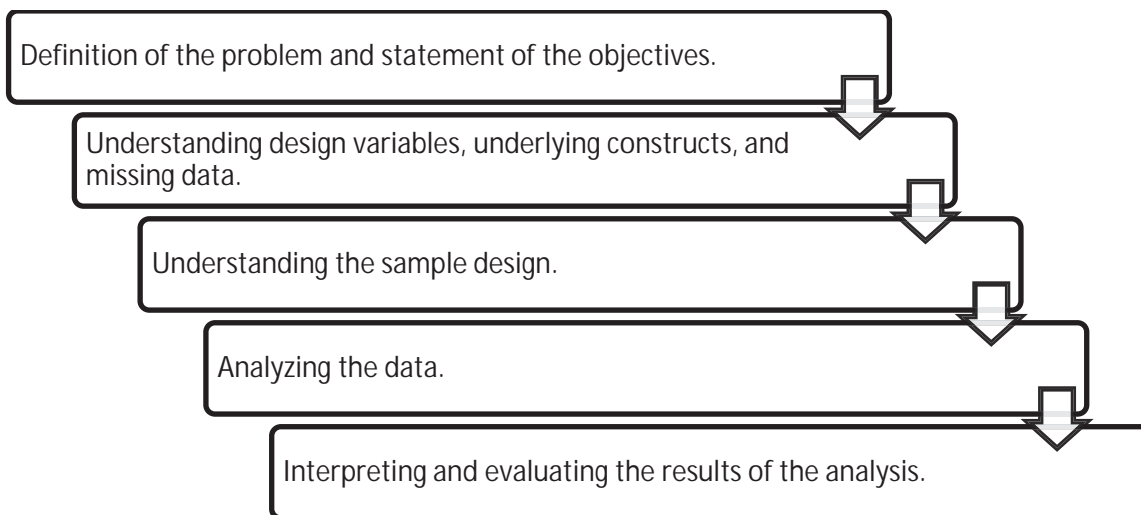


Figure 8-1 Steps in applied survey data analysis

The applied study methodology is supported by the succession of the following stages:

8.4.1 Applied Study Objective

The study main objective is creating an applicable developed methodology for Sustainable Impact Assessment for the Cultural Heritage Projects through setting out the

¹ Cox, D.R., Applied Statistics: A Review, *Annals of Applied Statistics*, 1(1), 1-16, 2007, 1.

mutual relations between cultural heritage sustainable objectives with each other and the users' degree of preference for each sub objective.

8.4.2 Applied Study Setting

Sampling design that generated the sample of elements (e.g., persons, businesses) from the target population of interest, given that the actual survey data with which the research will be working were collected from the elements in this sample. The sections in this chapter outline the key elements of complex sample designs that analysts need to understand to proceed knowledgeably and confidently to the next step in the analysis process.

8.4.2.1 Survey design

Before distributing a survey, pilot-test; first is distributed to ensure that the instructions, questions and scale items are clear, on the same type of people who will be used in the main study. Pilot test ensure that respondents can understand the survey or questionnaire items and respond appropriately. Pilot-testing should also pick up any questions or items that may offend potential respondents.

8.4.2.2 Preparing a Questionnaire

A pilot questionnaire was designed, tested and evaluated for both users and Experts. The survey questionnaire was modified according to the pilot test results. The data obtained from the field was tabulated and then analyzed. The cultural heritage examples which were examined in the survey were selected according to their different approach towards culture heritage to make the result applicable on cultural heritage as a general concept. The questionnaire contained 30 closed question involves offering respondents a number of defined response choices. (Appendix C). The majority of questions were sustainable objectives items based on a Likert-type scale from "strongly disagree" to "strongly agree" or from "not interested" to 'very interested".

8.4.3 Sampling Procedures and Sample Sizes

Due to the nature of the experiment, there must be a minimum level of cultural and technical background that enables sample members to evaluate and interact with the survey.

The sample was composed of 95 Projects residents or users with a variety of socioeconomic and demographical characteristics.

8.4.4 Statistical analysis

The sample preferences concerning evaluating the three main sustainable objectives,(Environmental, Social and Economic) and their sub objectives which were analyzed, in order to find the evaluation factor for each sub criteria so as to help in selecting highest preferred regeneration alternative, and to explore public users preferences for the conservation objectives. The guiding rule between the three main objectives will also be calculated.

Each evaluation for each sub-criterion determines users' preferences towards specific conservation indicator of conservation objective, these preferences the architects have to put them into consideration when conserving culture heritage projects to meet people needs and preferences. This will be more valuable in the assessment methodology.

8.4.5 The used methods of Statistical analysis

The collected data were first been emptying manually in data tables, then the data were been entered to the computer, first in Excel program to be entered next to (SPSS) which is shortcut to (Statistical Package for Social Sciences), with version 20.0.0.

This program is considered one of the strongest programs which have the ability of analyzing large data, and this program relies on the probability theory which we can predict from its results with the relations of different variables.¹ Statistics included in the base software are:

- Descriptive statistics: Cross tabulation, Frequencies, Descriptive, Explore, and Descriptive Ratio Statistics.
- Bivariate statistics: Means, t-test, ANOVA, Correlation (bivariate, partial, distances), nonparametric tests.
- Prediction for numerical outcomes: Linear regression
- Prediction for identifying groups: Factor analysis, cluster analysis (two-step, K-means, hierarchical), and discriminate.

¹ URL: <http://en.wikipedia.org/wiki/Spss>

8.4.6 The outputs of Statistical analysis

After analyzing the data with (SPSS) program, the outputs of the statistical analysis will be put in tables and charts in order to:

- Determining the mean factor and standard deviation of each sub-criterion.
- Determining the evaluation factor.
- Determining the sustainable conservation equation for culture heritage projects.
- Using comparative mean values to understand public users' preferences.

Each Sub criterion was coded by a symbol as shown in table 8-1, named a variable in SPSS program

Table 8-1 code entered for each sub objective

Target	Main Objective	Sub Objective/criterion	Code
Aspects For Sustainable Impact Assessment For Culture Heritage Projects	Environmental (E)	Improve Air Quality	E1
		Improve Water Quality	E2
		Conserve Soil Resources And Improve Its Quality	E3
		Minimize The Production Of Waste	E4
		Reduce Contributions To Climate Change	E5
		Reduce Vulnerability To Climate Change	E6
		Reduce The Effect Of Traffic On The Environment	E7
		Maintain And Enhance Biodiversity, Flora And Fauna	E8
		Provide For Sustainable Sources Of Water Supply "Reduce Water Consumption"	E9
		Conserve And Where Appropriate Enhance The Historic Environment	E10
		Maintain And Enhance The Quality Of Landscapes And Townscapes	E11
	Social (S)	Encourage A Sense Of Community Identity And Welfare	S1
		Reduce Anti-Social Activity	S2
		Improve The Education And Skills Of The Population Overall	S3
		Provide Everybody With The Opportunity To Live In A Decent Home	S4
		Improve Health Of The Population Overall	S5
		Accessibility To Essential Services And Facilities	S6
		Offer Everybody The Opportunity For Rewarding And Satisfying Employment	S7
		Reduce Poverty And Social Exclusion	S8
		Improve The Quality Of Where People Live	S9
		Improve Accessibility For Those Most In Need	S10
	Economic (EC)	Encourage Sustained Economic Growth	EC1
		Reduce Disparities In Economic Performance	EC2
		Encourage And Accommodate Both Indigenous And Inward Investment	EC3
		Encourage Efficient Patterns Of Movement In Support Of Economic Growth	EC4
		Enhance The Image Of The Area As A Business Location	EC5
		Improve The Social And Environmental Performance Of The Economy	EC6

a) Determining the mean factor and standard deviation of each sub-criterion

One-way one way analysis of variance ANOVA was processed and the output data of (SPSS) was in table 8-2, all the evaluation objective and sub-objective/criterion has mean factor; where all sub-criteria has the same weight. The next column is the standard deviation of each sub-criterion.

Table 8-2 The Mean Factor and the Standard Deviation of each Sub Criterion.

Target	Main objective	Sub objective/criterion	Mean factor	Standard deviation
Aspects for Sustainable Impact Assessment For Culture Heritage Projects	Environmental (E)	Improve Air Quality	3.21	1.015
		Improve Water Quality	2.59	1.099
		Conserve Soil Resources and Improve its Quality	3.00	1.055
		Minimize the Production of Waste	3.00	1.006
		Reduce Contributions to Climate Change	3.08	.991
		Reduce Vulnerability to Climate Change	3.44	.653
		Reduce the Effect of Traffic on the Environment	3.34	.993
		Maintain and Enhance Biodiversity, Flora and Fauna	3.59	1.219
		Provide for Sustainable Sources of Water Supply "Reduce Water Consumption"	2.79	.910
		Conserve and Where Appropriate Enhance the Historic Environment	4.30	.513
		Maintain and Enhance The Quality of Landscapes and Townscapes	4.13	.973
	Social (S)	Encourage a sense of community identity and welfare	3.88	.700
		Reduce anti-social activity	3.71	.860
		Improve the education and skills of the population overall	3.53	1.091
		provide everybody with the opportunity to live in a decent home	3.15	.731
		Improve health of the population overall	3.34	.693
		Accessibility to essential services and facilities	3.29	1.171
		Offer everybody the opportunity for rewarding and satisfying employment	3.10	1.109
		Reduce poverty and social exclusion	3.65	.956
		Improve the quality of where people live	4.10	.542
Improve accessibility for those most in need	3.39	1.073		

Target	Main objective	Sub objective/criterion	Mean factor	Standard deviation
	Economic (EC)	Encourage Sustained Economic Growth	3.79	.758
		Reduce Disparities In Economic Performance	3.35	.887
		Encourage And Accommodate Both Indigenous And Inward Investment	3.58	.808
		Encourage Efficient Patterns Of Movement In Support Of Economic Growth	3.54	.954
		Enhance The Image Of The Area As A Business Location	4.23	.763
		Improve The Social And Environmental Performance Of The Economy	4.08	.689

b) Correlation Analysis between Variables

Correlations measure how variables are related. Correlation coefficients significant at the 0.05 level are identified with a single asterisk, and those significant at the 0.01 level are identified with two asterisks. Then the correlation is significant and the two variables are linearly related, if the significance level is not significant and the two variables are not linearly related. As shown in table 8-3 the variables are strongly related to each other, most of the correlation matrix table is highlighted. Also there is a strong relation between variables which have the same main objectives.

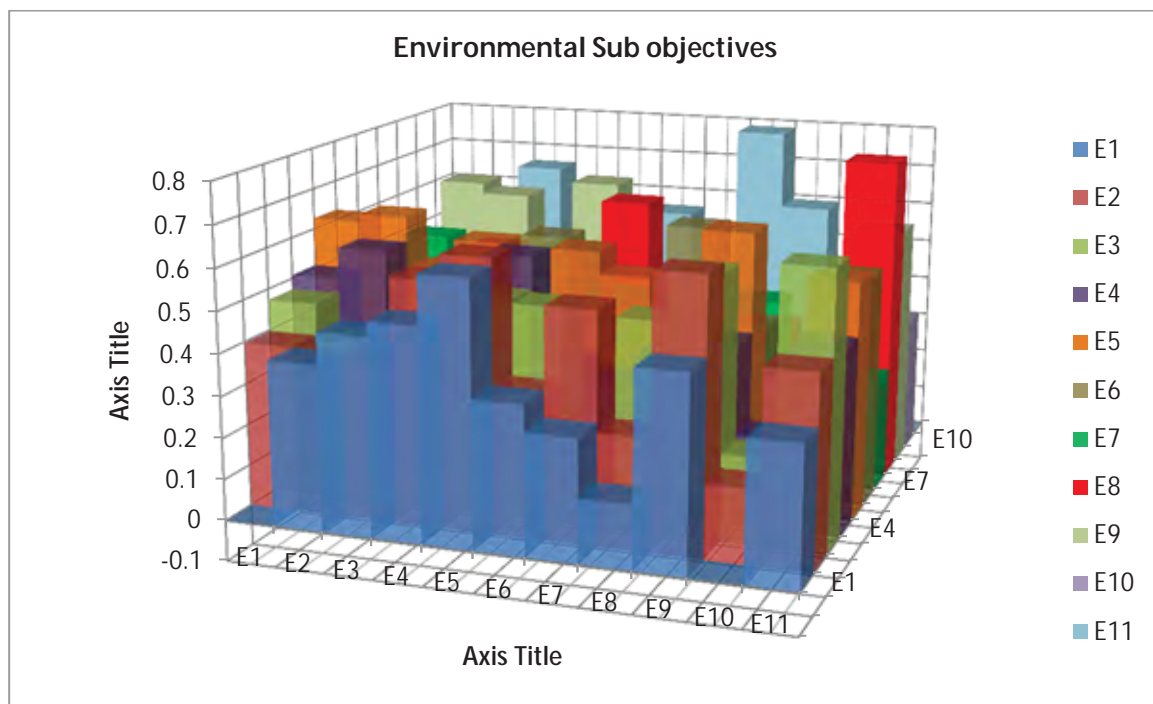


Figure 8-2 3D chart representing results of correlation table between the environmental variables with each other

Table 8-3 Correlation Matrix

	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	EC1	EC2	EC3	EC4	EC5	EC6	
E1	1	.397	.473	.508	.626	.355	.292	.154	.461	-.002	.332	.127	.055	-.216	.317	.203	.097	.026	.496	-.154	-.100	-.122	-.259	.323	.329	.341	-.258	
E2	.397	1	.382	.584	.645	.343	.547	.268	.646	.177	.452	.393	-.074	-.240	.031	.252	.428	.205	.308	-.057	.296	-.213	-.129	-.100	-.054	.068		
E3	.473	.382	1	.417	.521	.514	.012	.502	.620	.210	.653	-.051	-.042	.110	.197	-.173	.297	.227	.050	.022	.324	.301	.267	.277	-.031	.017		
E4	.508	.584	.417	1	.597	.347	.317	.382	.428	.221	.440	.323	-.117	.265	.293	-.200	.161	.079	.263	.046	.223	.190	.057	-.016	.013	-.181	-.018	
E5	.626	.645	.521	.597	1	.594	.540	.466	.664	.105	.568	.233	-.123	.330	.260	-.129	.221	.249	.453	-.061	.127	-.012	.246	.141	.248	.232	.095	
E6	.355	.343	.514	.347	.594	1	.433	.643	.414	.283	.551	.149	-.179	-.078	-.060	.247	.032	-.114	-.035	.018	.098	.190	.082	.141	.248	.232	.095	
E7	.292	.547	.012	.317	.540	.433	1	.242	.445	.196	.270	.480	-.137	.423	.108	.108	.688	.502	.341	-.125	.577	-.122	-.198	-.140	-.166	.018		
E8	.154	.268	.502	.382	.466	.643	.242	1	.354	.261	.781	.205	-.058	-.058	-.058	-.013	-.203	.203	.092	.351	.114	.425	.372	.433	.395	.218		
E9	.461	.646	.620	.664	.664	.414	.445	.354	1	.084	.588	.195	-.047	.321	.448	.448	.056	.056	.159	-.085	.111	.062	-.021	-.042	-.113	-.176		
E10	-.002	.177	.210	.221	.105	.283	.196	.261	.084	1	.330	.141	-.175	-.061	.216	-.075	.192	-.120	.139	.118	.039	.058	.211	.128	.261	.278	.150	
E11	.332	.452	.330	.440	.568	.330	.781	.330	.588	.330	1	.135	-.032	.277	-.134	-.032	-.032	-.082	-.020	.096	-.011	.277	.183	.230	.399	.132	.024	
S1	.127	.393	-.051	.323	.233	.149	.480	.296	.196	.141	.135	1	.065	.261	-.136	.349	.554	.228	-.161	.200	.453	-.075	-.234	-.073	.026	.196	.125	
S2	.066	-.074	-.042	-.117	-.123	-.179	.137	-.047	-.047	-.175	.335	.066	1	.487	.009	.484	-.105	.402	.061	.481	-.221	-.114	-.032	-.196	-.195	-.132	-.027	
S3	-.216	-.240	.110	.265	.330	-.078	.423	.321	-.129	-.081	.277	.261	.487	1	.361	.031	.447	.647	.567	.240	.425	.183	.436	.242	.249	-.007	.267	
S4	.317	.031	.197	.031	.265	.034	.034	.034	-.104	.216	.136	.136	.009	.361	1	-.001	.274	.106	.475	.121	.167	.035	.269	.131	.245	.211	.279	
S5	.203	.252	-.173	.290	.129	-.247	.108	-.035	.035	-.075	-.349	.484	-.031	.031	1	.269	-.012	-.012	.297	.327	-.042	-.247	-.339	-.329	-.241	-.160		
S6	.097	.428	.688	.161	.221	.032	.688	.448	.129	.192	.326	.554	-.105	.447	.274	.269	1	.568	.350	.094	.696	.272	.390	.337	-.231	.153	.067	
S7	.026	-.205	.227	-.079	-.249	-.114	.502	-.203	-.066	-.120	-.062	-.228	.402	.647	.106	-.012	.568	1	.511	-.143	.565	.191	.401	.232	.260	-.072	.089	
S8	.496	.306	.050	.263	.453	-.005	.341	-.092	-.159	.139	-.020	-.161	.061	.567	.475	.297	.350	.511	1	.215	.251	.542	.713	.592	.653	.422	.444	
S9	-.154	-.057	.022	.046	-.061	.018	.125	.351	-.085	.118	.056	.203	-.240	-.240	.121	.297	.094	-.143	.215	1	.237	.299	.190	.359	.384	.312	.251	
S10	-.100	.296	.324	.223	.127	.068	.577	.114	.111	.039	-.011	.453	-.221	.425	.167	-.042	.696	.565	.261	.237	1	-.100	-.184	-.173	-.107	.140	.080	
EC1	-.122	-.213	.391	.100	-.012	.190	-.122	.425	.062	.068	.277	-.075	-.114	.163	.035	.247	.272	.191	.542	.299	.100	1	.639	.616	.615	.325	.370	
EC2	.323	-.201	.284	.057	-.246	.082	.366	.276	-.095	.211	.163	-.234	-.032	.436	.269	-.	.272	.401	.713	.190	-.184	.639	1	.616	.702	.256	.432	
EC3	-.259	-.129	.267	-.016	-.165	.141	-.196	.372	-.021	.128	.239	-.073	.186	.242	.131	.329	.390	.232	.592	.359	-.173	.616	.616	1	.727	.445	.399	
EC4	.329	-.100	.277	.013	-.097	.248	-.140	.433	-.042	.261	.309	.026	-.195	.249	.246	.297	-.231	.260	.653	.384	-.107	.615	.702	.727	1	.615	.573	
EC5	-.258	-.054	.017	-.181	-.018	.018	.166	.018	-.113	.150	.132	.196	-.132	-.007	.211	.241	.153	-.072	.422	.312	.140	.325	.256	.445	.615	1	.497	
EC6	-.258	.068	.017	-.181	-.018	.018	.166	.018	-.113	.150	.132	.196	-.132	-.007	.211	.241	.153	-.072	.422	.312	.140	.370	.432	.399	.573	.497	1	

As shown in figure 8-2 that there is a strong relation between most of variables while there is no relation between conserving and where appropriate enhance the historic

environment sub criterion (E10) and improve of water quality (E2), Reduce Contributions to Climate Change (E5) and Provide for Sustainable Sources of Water Supply "Reduce Water Consumption" (E9). There is also no relation between Maintain and Enhance Biodiversity, Flora and Fauna (E8) and Improve Air Quality (E1) and between Reduce the Effect of Traffic on the Environment (E7) and Conserve Soil Resources and Improve its Quality (E3).

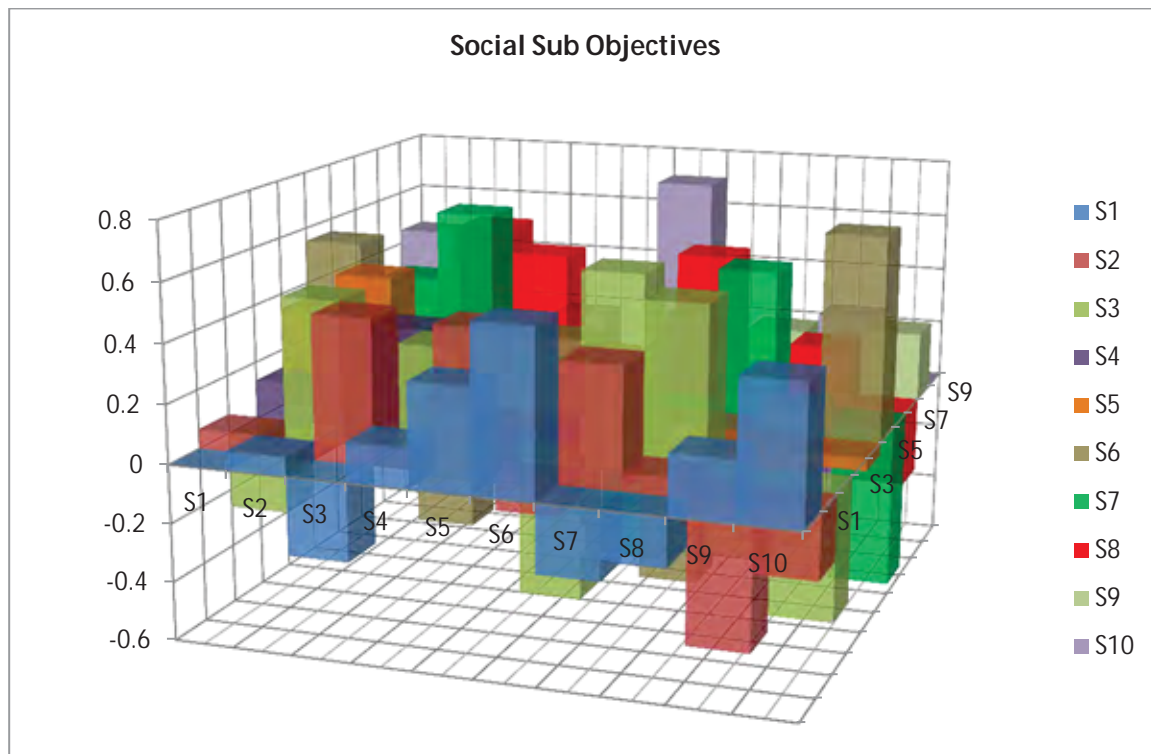


Figure 8-3 3D chart representing results of correlation table between the social variables with each other

As shown in figure 8-3 that there is a strong relation between most of variables while there is no relation between Provide Everybody With The Opportunity To Live In A Decent Home sub criterion (S4) and other Sub criterion except; Accessibility To Essential Services And Facilities (S6) and Reduce Poverty And Social Exclusion (S8). Improve Health of the Population Overall (S5) also has no relation with Improve the Education and Skills of the Population Overall (S3), Offer Everybody the Opportunity for Rewarding and Satisfying Employment (S7).

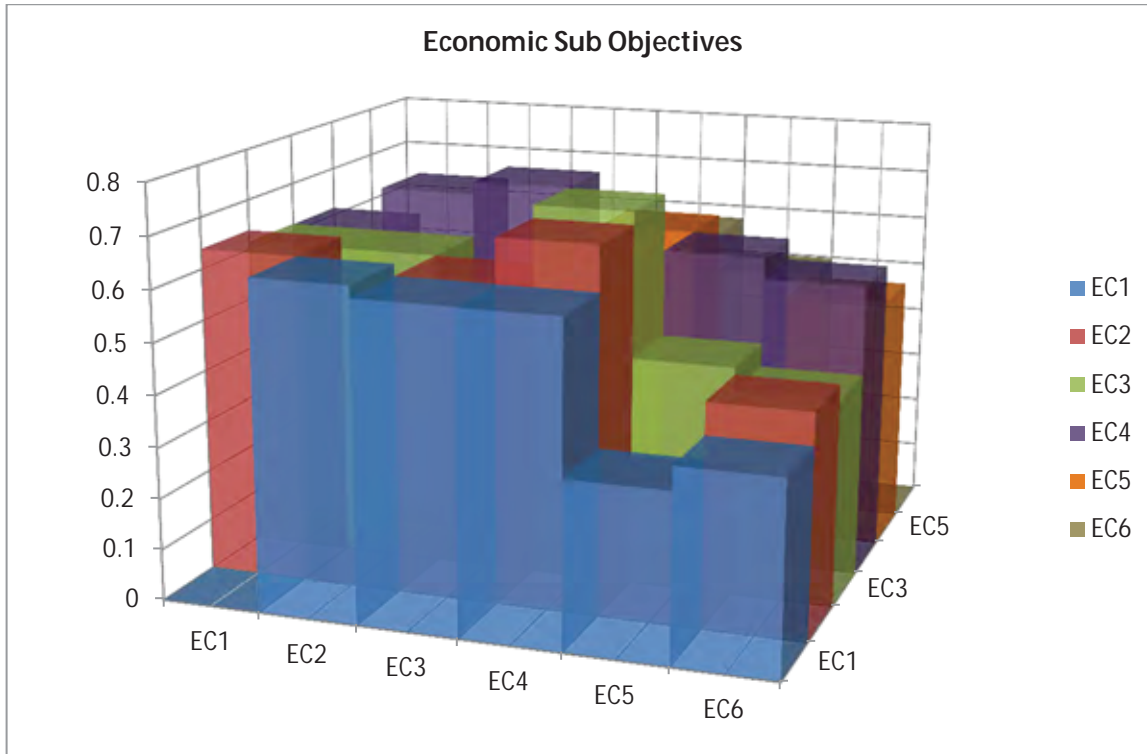


Figure 8-4 3D chart representing results of correlation table between the economic variables with each other As shown in figure 8-4 that there is a strong relation between all of economic variables with each other.

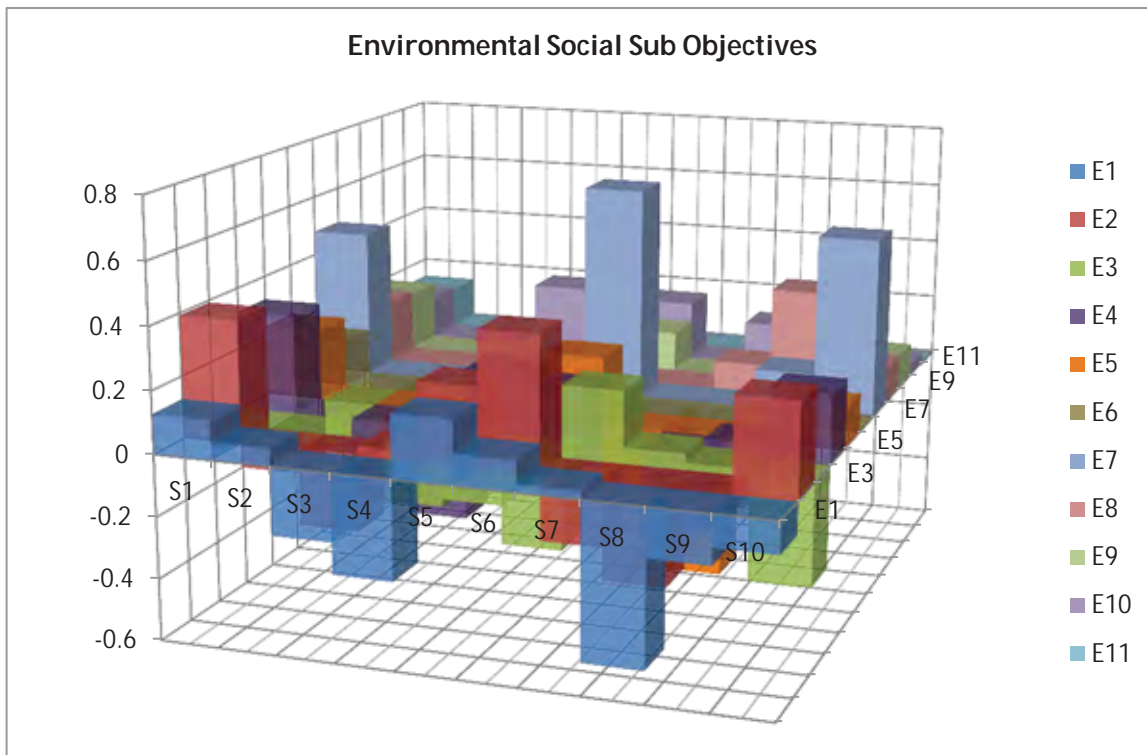


Figure 8-5 3D chart representing results of correlation table between the environmental variables with social variables. As shown in fig 8-5 that there is a strong relation between:

-
- Encourage a sense of community identity and welfare (**S1**) and Improve Water Quality (E2), Minimize the Production of Waste (E4), Reduce the Effect of Traffic on the Environment (E7), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Provide for Sustainable Sources of Water Supply "Reduce Water Consumption" (E9) .
 - Reduces anti-social activity (**S2**) and Maintain and Enhance Biodiversity, Flora and Fauna (E8), Maintain and Enhance the Quality of Landscapes and Townscapes (E11).
 - Improve the education and skills of the population overall (**S3**) and Improve Air Quality (E1), Improve Water Quality (E2), Minimize the Production of Waste (E4), Reduce Contributions to Climate Change (E5), Reduce the Effect of Traffic on the Environment (E7), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Maintain and Enhance The Quality of Landscapes and Townscapes (E11).
 - Provide everybody with the opportunity to live in a decent home (**S4**) and Improve Air Quality (E1), Conserve Soil Resources and Improve its Quality (E3), Minimize the Production of Waste (E4), Reduce Contributions to Climate Change(E5), Conserve and Where Appropriate Enhance the Historic Environment (E10).
 - Improve health of the population overall (**S5**) and Improve Air Quality (E1), Improve Water Quality (E2), Minimize the Production of Waste (E4), Reduce Vulnerability to Climate Change (E6), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Maintain and Enhance The Quality of Landscapes and Townscapes (E11).
 - Accessibility to essential services and facilities (**S6**) and Improve Water Quality (E2), Conserve Soil Resources and Improve its Quality (E3), Reduce Contributions to Climate Change (E5), reduce the Effect of Traffic on the Environment (E7), Conserve and Where Appropriate Enhance the Historic Environment (E10).
 - Offer everybody the opportunity for rewarding and satisfying employment (**S7**) and Improve Water Quality (E2), Conserve Soil Resources and Improve its Quality (E3), Reduce Contributions to Climate Change(E5), Reduce the Effect of Traffic on the Environment (E7), Maintain and Enhance Biodiversity, Flora and Fauna (E8).

- Reduce poverty and social exclusion (**S8**) and Improve Air Quality (E1), Improve Water Quality (E2), Minimize the Production of Waste (E4), Reduce Contributions to Climate Change (E5), Reduce the Effect of Traffic on the Environment (E7).
- Improve the quality of where people live (**S9**) and Maintain and Enhance Biodiversity, Flora and Fauna (E8).
- Improve accessibility for those most in need (**S10**) and Improve Water Quality (E2), Conserve Soil Resources and Improve its Quality (E3), Minimize the Production of Waste (E4), Reduce the Effect of Traffic on the Environment (E7).

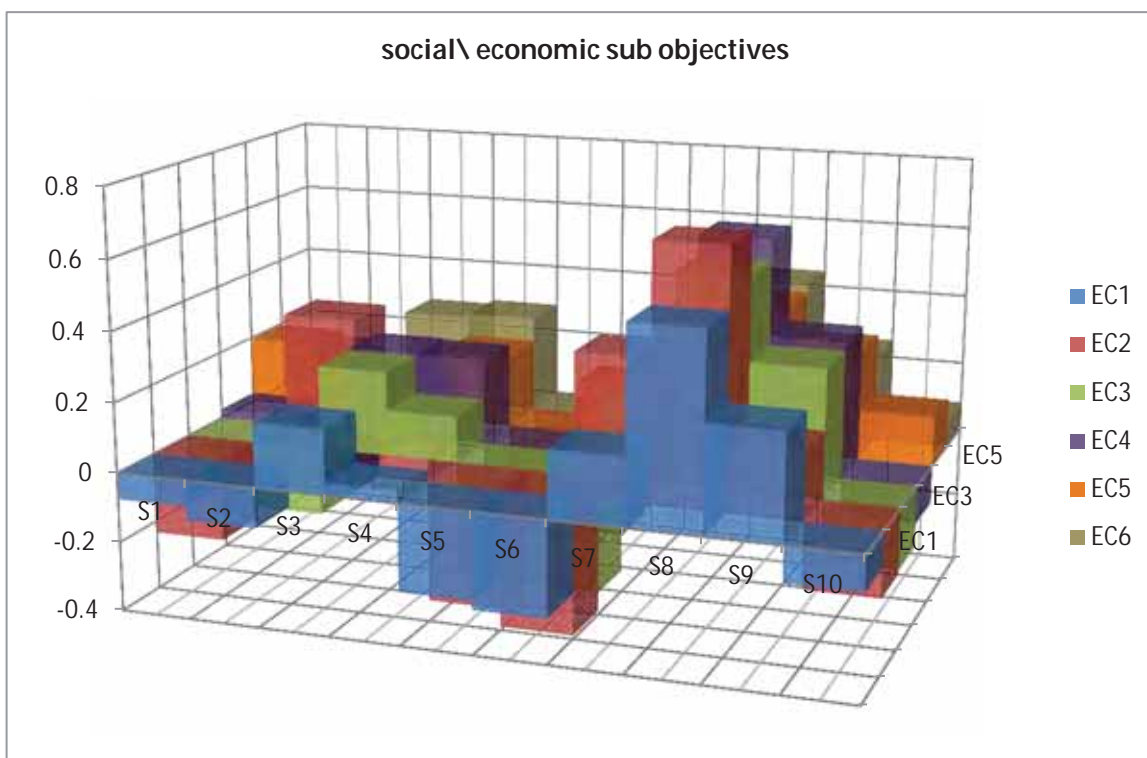


Figure 8-6 3D chart representing results of correlation table between the economic variables with social variables.

As shown in figure 8-6 that there is a strong relation between:

- Encourage a sense of community identity and welfare (**S1**) reduce disparities in economic performance (EC2), enhance the image of the area as a business location (EC5).
- Reduces anti-social activity (**S2**) and encourages and accommodates both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4).

-
- Improve the education and skills of the population overall (**S3**) and reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4), improve the social and environmental performance of the economy (EC6).
 - Provide everybody with the opportunity to live in a decent home (**S4**) and reduce disparities in economic performance (EC2), encourage efficient patterns of movement in support of economic growth (EC4), enhance the image of the area as a business location (EC5), improve the social and environmental performance of the economy (EC6).
 - Improve health of the population overall (**S5**) and encourage sustained economic growth (EC1), reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4), enhance the image of the area as a business location (EC5).
 - Accessibility to essential services and facilities (**S6**) and encourage sustained economic growth (EC1), reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4).
 - Offer everybody the opportunity for rewarding and satisfying employment (**S7**) and encourage sustained economic growth (EC1), reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4).
 - Reduce poverty and social exclusion (**S8**) and encourage sustained economic growth (EC1), reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient patterns of movement in support of economic growth (EC4), enhance the image of the area as a business location (EC5), improve the social and environmental performance of the economy (EC6).
 - Improve the quality of where people live (**S9**) and encourage sustained economic growth (EC1), reduce disparities in economic performance (EC2), encourage and accommodate both indigenous and inward investment (EC3), encourage efficient

patterns of movement in support of economic growth (EC4), enhance the image of the area as a business location (EC5), improve the social and environmental performance of the economy (EC6).

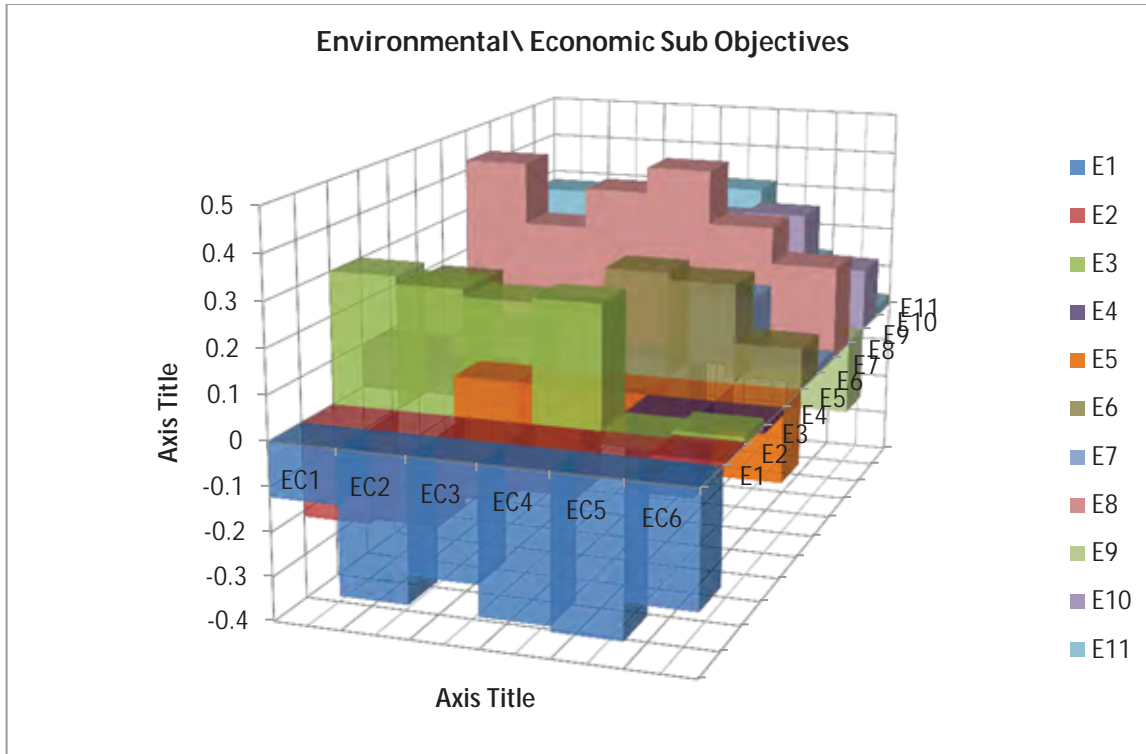


Figure 8-7 3D chart representing results of correlation table between the economic variables with environmental variables.

As shown in figure 8-7 that there is a strong relation between:

- Encourage sustained economic growth (**EC1**) and Improve Water Quality (E2), Conserve Soil Resources and Improve its Quality (E3), Reduce Vulnerability to Climate Change(E6), Maintain and Enhance Biodiversity, Flora and Fauna (E8),Maintain and Enhance The Quality of Landscapes and Townscapes (E11).
- Reduce disparities in economic performance (**EC2**) and Improve Air Quality (E1), Improve Water Quality (E2), Conserve Soil Resources and Improve its Quality (E3), Reduce Contributions to Climate Change (E5), Reduce the Effect of Traffic on the Environment (E7), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Conserve and Where Appropriate Enhance the Historic Environment (E10).
- Encourage and accommodate both indigenous and inward investment (**EC3**) and Improve Air Quality (E1), Conserve Soil Resources and Improve its Quality (E3), Reduce the Effect of Traffic on the Environment (E7), Maintain and Enhance

Biodiversity, Flora and Fauna (E8), Maintain and Enhance The Quality of Landscapes and Townscapes (E11).

- Encourage efficient patterns of movement in support of economic growth (**EC4**) and Improve Air Quality (E1), Conserve Soil Resources and Improve its Quality (E3), Reduce Vulnerability to Climate Change(E6), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Conserve and Where Appropriate Enhance the Historic Environment (E10),Maintain and Enhance The Quality of Landscapes and Townscapes (E11).
- Enhance the image of the area as a business location (**EC5**) and Improve Air Quality (E1),Reduce Vulnerability to Climate Change(E6), Maintain and Enhance Biodiversity, Flora and Fauna (E8), Conserve and Where Appropriate Enhance the Historic Environment (E10).
- Improve the social and environmental performance of the economy (**EC6**) and Improve Air Quality (E1),Maintain and Enhance Biodiversity, Flora and Fauna (E8) .

c) Factor Analysis

Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. Factor analysis is often used in data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables. Factor analysis can also be used to generate hypotheses regarding causal mechanisms or to screen variables for subsequent analysis. Factor analysis results table 8-4. Where Communalities indicate the amount of variance in each variable that is accounted for, the analysis shows that all variables will be considered.

Table 8-4 factor analysis communalities table

Communalities		
code	Initial	Extraction
E1	1.000	.660
E2	1.000	.711
E3	1.000	.815
E4	1.000	.693
E5	1.000	.808
E6	1.000	.631
E7	1.000	.742
E8	1.000	.815
E9	1.000	.654
E10	1.000	.368
E11	1.000	.787
S1	1.000	.669
S2	1.000	.695
S3	1.000	.805
S4	1.000	.683
S5	1.000	.737
S6	1.000	.854
S7	1.000	.710
S8	1.000	.832
S9	1.000	.563
S10	1.000	.678
EC1	1.000	.666
EC2	1.000	.730
EC3	1.000	.693
EC4	1.000	.828
EC5	1.000	.566
EC6	1.000	.539

d) Determining the evaluation of each sub-criterion

By analysis the factor of each criterion and its mean; the Evaluation Factor for each sub criterion was concluded as shown in table 8- 5.

Table 8-5 evaluation factor for each sub criterion

Target	Main Aspects	Sub Aspects	Code	Evaluation Factor
Aspects for Sustainable Impact Assessment For Culture Heritage Projects	Environmental (E)	Improve Air Quality	E1	3.5%
		Improve Water Quality	E2	3.8%
		Conserve Soil Resources and Improve its Quality	E3	4.3%
		Minimize the Production of Waste	E4	3.7%
		Reduce Contributions to Climate Change	E5	4.3%
		Reduce Vulnerability to Climate Change	E6	3.3%
		Reduce the Effect of Traffic on the Environment	E7	3.9%
		Maintain and Enhance Biodiversity, Flora and Fauna	E8	4.3%
		Provide for Sustainable Sources of Water Supply "Reduce Water Consumption"	E9	3.5%
		Conserve and Where Appropriate Enhance the Historic Environment	E10	1.9%
		Maintain and Enhance The Quality of Landscapes and Townscapes	E11	4.2%
	Social (S)	Encourage a sense of community identity and welfare	S1	3.5%
		reduce anti-social activity	S2	3.7%
		improve the education and skills of the population overall	S3	4.3%
		provide everybody with the opportunity to live in a decent home	S4	3.6%
		improve health of the population overall	S5	3.9%
		accessibility to essential services and facilities	S6	4.5%
		offer everybody the opportunity for rewarding and satisfying employment	S7	3.8%
		reduce poverty and social exclusion	S8	4.4%
		improve the quality of where people live	S9	3.0%
		improve accessibility for those most in need	S10	3.6%
	Economic (EC)	Encourage Sustained Economic Growth	EC1	3.5%
		Reduce Disparities In Economic Performance	EC2	3.9%
		Encourage And Accommodate Both Indigenous And Inward Investment	EC3	3.7%
		Encourage Efficient Patterns Of Movement In Support Of Economic Growth	EC4	4.4%

Target	Main Aspects	Sub Aspects	Code	Evaluation Factor
		Enhance The Image Of The Area As A Business Location	EC5	3.0%
		Improve The Social And Environmental Performance Of The Economy	EC6	2.8%

e) Comparing between the percentages of each objective, by comparing mean of each sub criterion, with each sub criterion with considering the evaluation factor.

As shown in figure (8-8) to figure (8-10) there are differences in value between the mean of each evaluation sub-criterion if all twenty seven sub-criteria have the same weight, and if the mean of each was multiplied by the evaluation factor.

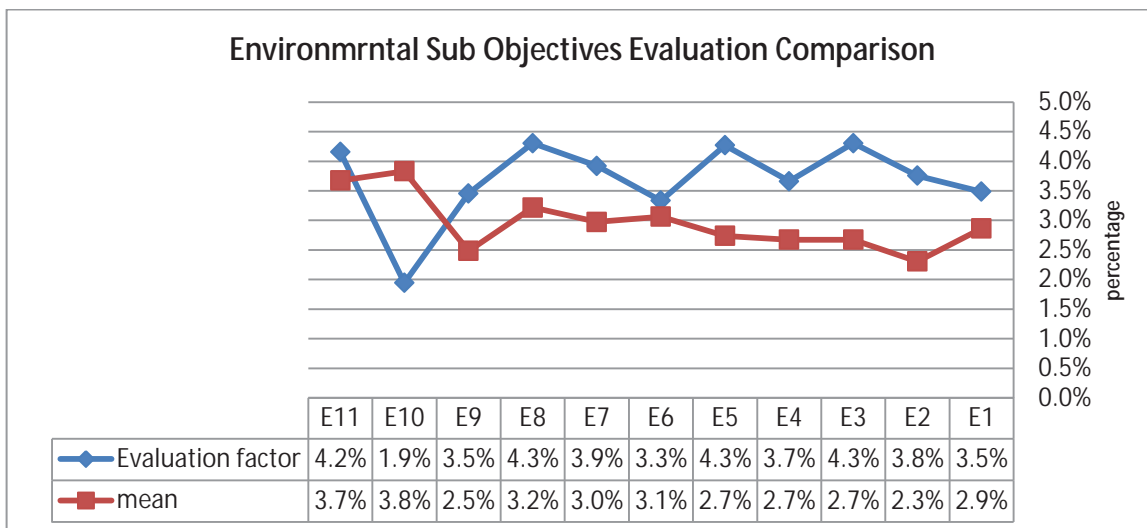


Figure 8-8 Environmental Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor

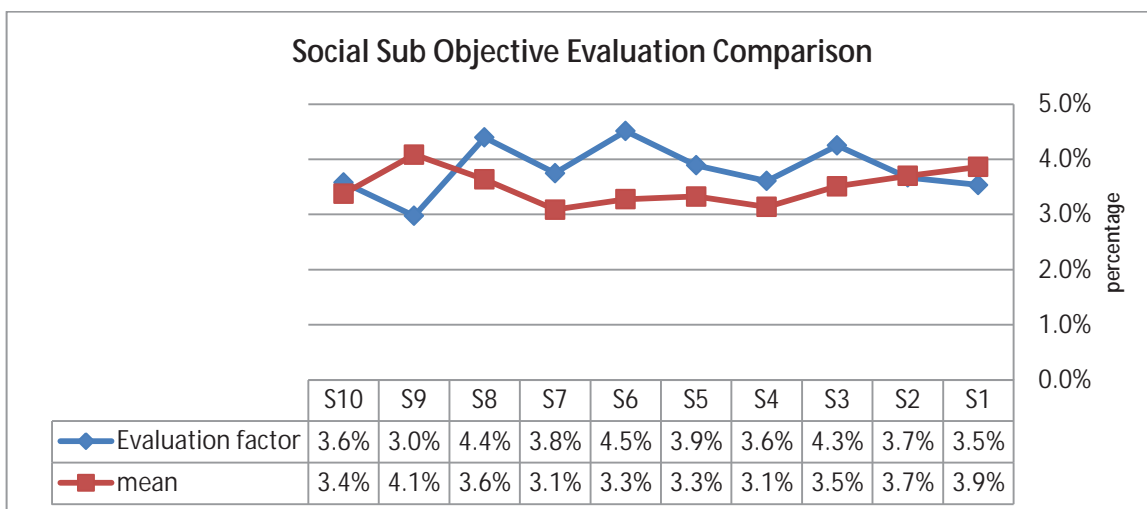


Figure 8-9 Social Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor

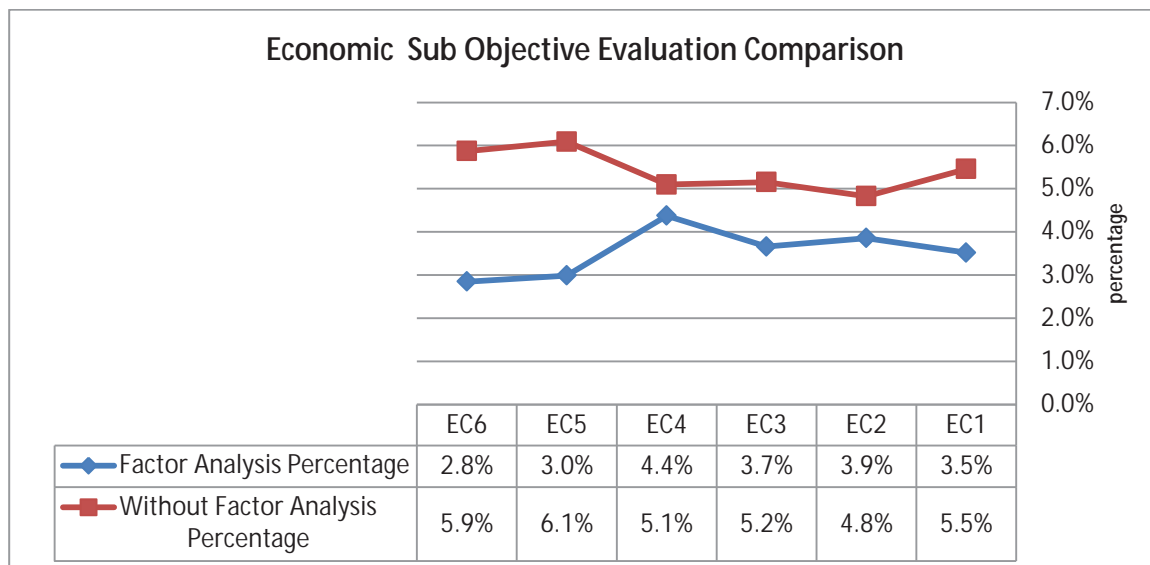


Figure 8-10 Economic Sub Objective differences between users' evaluation mean, once as all criteria have the same weight, the other with consideration of calculated evaluation factor

These differences have effective changes on the accumulative percentage of each criterion economic criterion has 32.5% with equal sub- criterion weight, and has 21% with taking in account the evaluation factor Fig8-11. These differences are important when we compare individual sub-criteria together. Which will be applied on Assessment of projects.

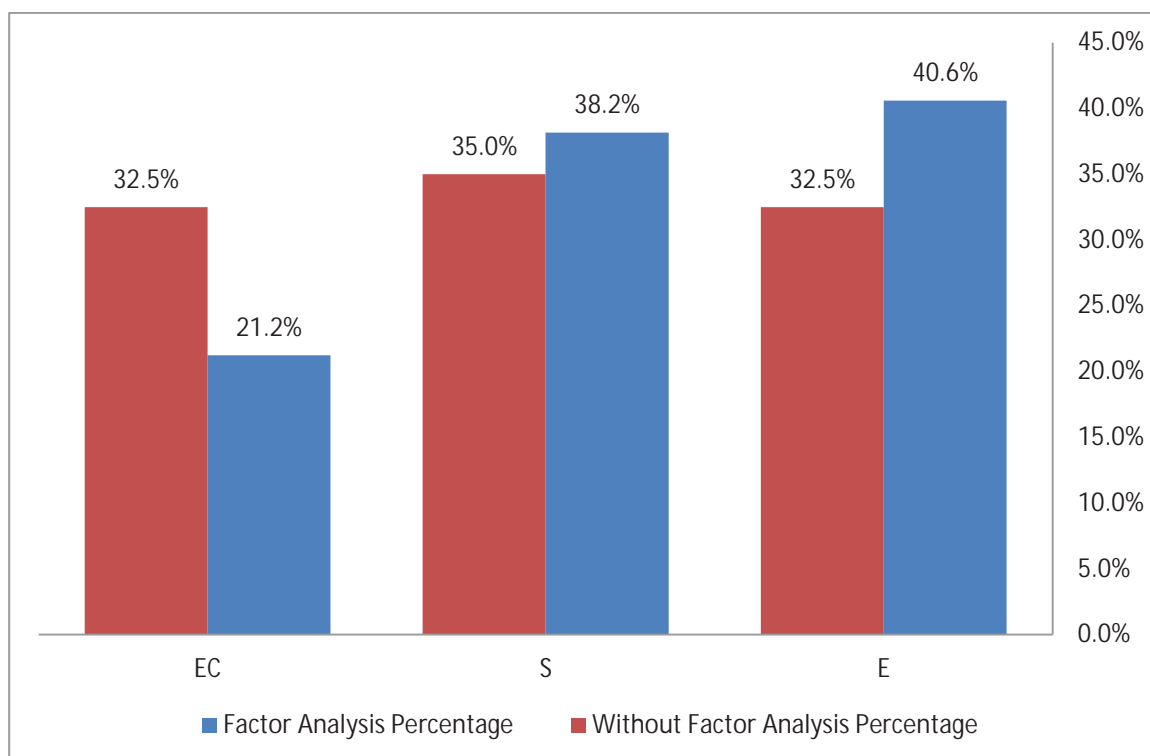


Figure 8-11 Main Objective differences between users' evaluation mean, with consideration of calculated evaluation factor.

f) Determining the Sustainable Conservation Equation for Culture Heritage Projects.

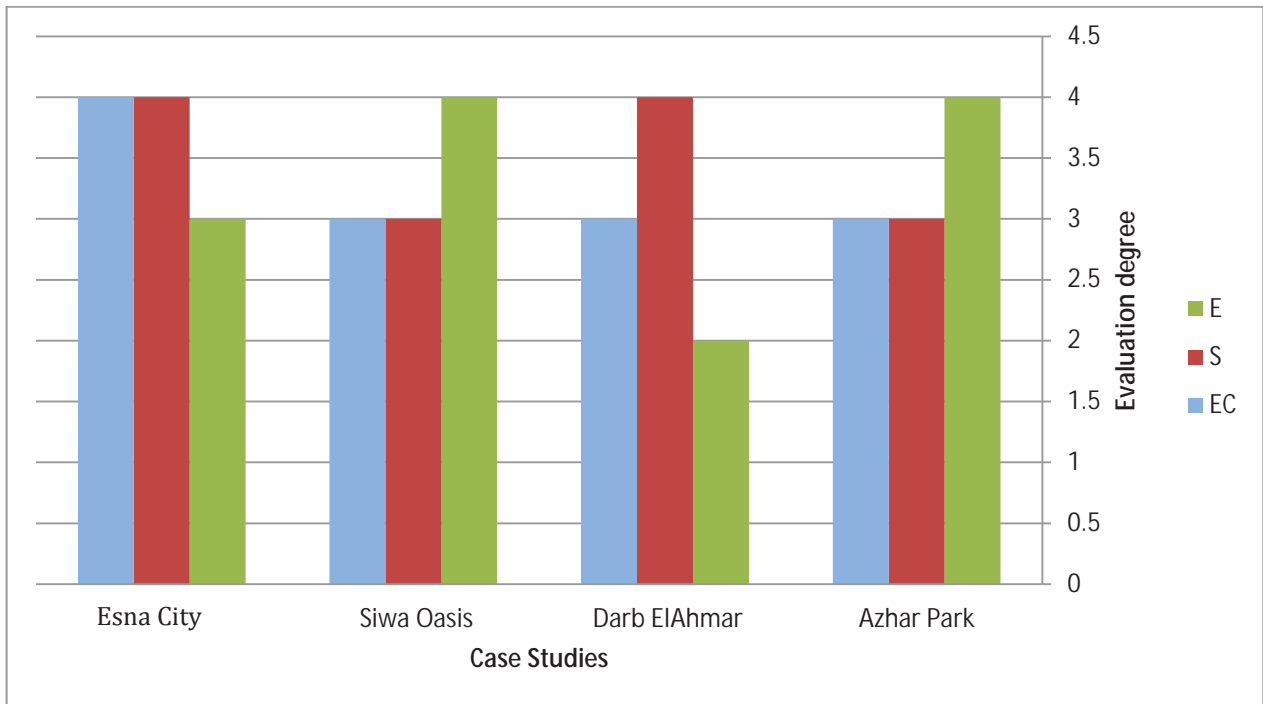


Figure 8-12 Main objectives evaluation by public users in the participation process for each project of case study.

Table 8-6 The Mean of the Main Objectives for each Case Study

Case Studies	Environmental	Social	Economic
Azhar Park	4	3	3
Darb ElAhmar	2	4	3
Siwa Oasis	4	3	3
Esna City	3	4	4

By calculating the mean for each objective in the case study conservation project, and using the algebraic analysis to find the controlling rule between the three main objectives as given in table (8-6) it was clear that there is a relation between the three main objectives of sustainable conservation; where a deducted equation was.

$$E + 2S - EC = 7 \quad \text{Where } |E - EC| = 1$$

It was also concluded that if $E > EC$ $S = 3$ and if $E < EC$ $S = 4$.

Where **E** for Environmental Objectives, **S** for Social Objectives and **EC** for Economic Objectives. In other words there is always one degree of difference between environmental objectives and the economic objectives. Also the social objective always varies between good and very good.

g) Comparing mean values to understand public users' preferences.

By comparing the mean values of different criteria for the four case studies public users' preferences for conservation objectives can be understood also understanding their needs which conservation program can be enhanced. The mean of each sub-criterion was determined in the Radar technique which was proposed to determine easily the strengths and weakness of each project.

Azhar Park was highly evaluated for environmental objective by users' participation, this project is very Environmental recommended because its high character of Improve Air Quality, Conserve Soil Resources and Improve its Quality, Reduce Contributions to Climate Change, but on the other hand the participant think that it is not good enough in improving water quality because it has not no relation between project and any water source. Fig 8-13

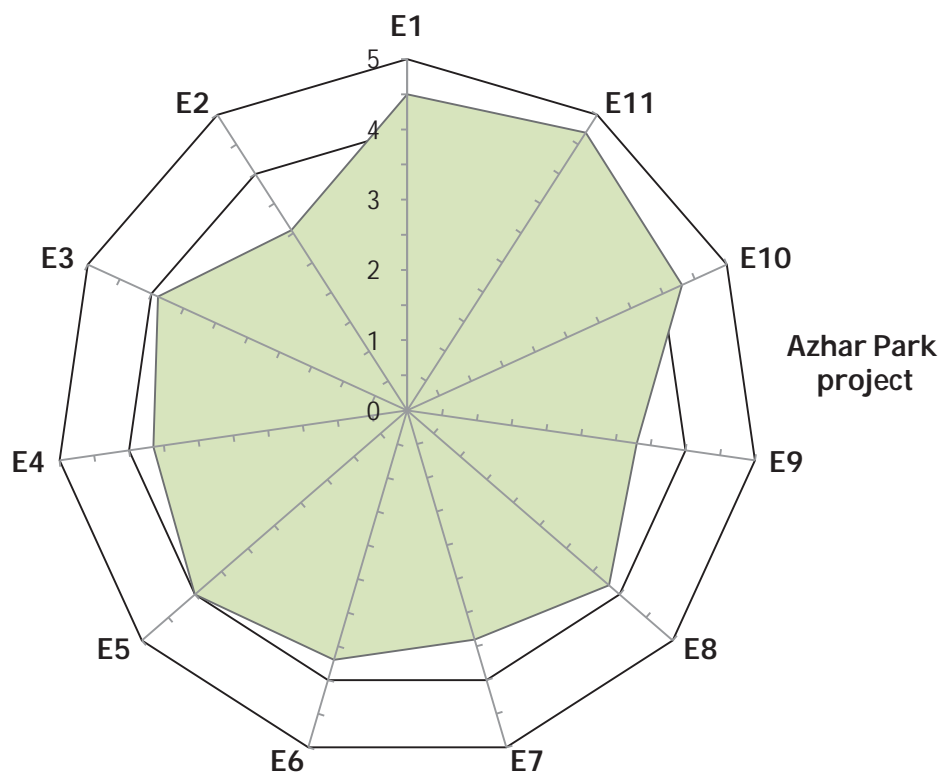


Figure 8-13 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).

While Azhar Park was medium evaluated for social objective by users' participation, this project is social recommended in Encouraging a sense of community identity and welfare, reduce anti-social activity, but on the other hand the participants think that it is not good enough in providing everybody with the opportunity to live in a decent home, which is reasonable cause it's a Park. Fig8-14.

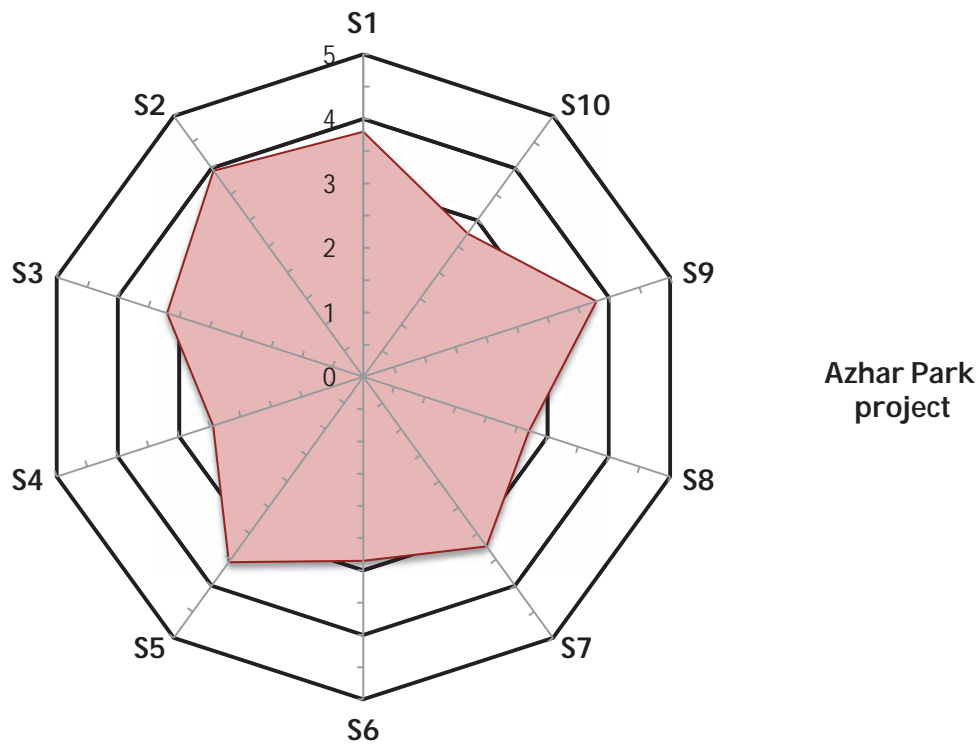


Figure 8-14 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Social objective).

Azhar Park was medium evaluated for economical objective by users' participation, this project was economical recommended in its enhancement for the image of the area as a business location, and improves the social and environmental performance of the economy, but on the other hand the participants think that it is not good enough in reducing disparities in economic performance. Fig8-15

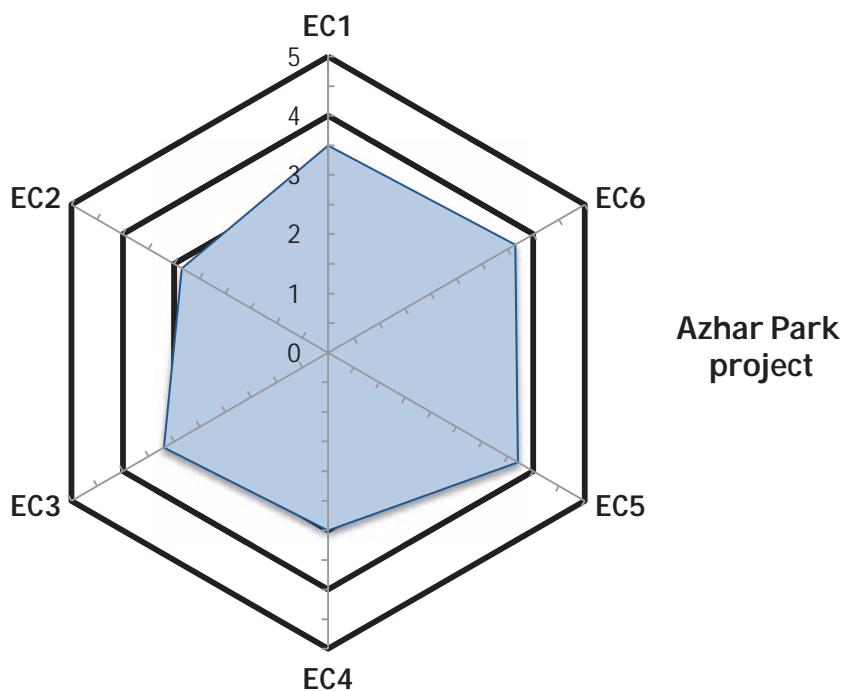


Figure 8-15 suggested format (Radar technique) for displaying how Azhar park project was evaluated by public users in the participation process in each sub-criterion (Economic objective).

Darb El Ahmar project is badly evaluated for environmental objective by users' participation, its Environmental recommended only its Conserve and Where Appropriate Enhance the Historic Environment, but on the other hand the participants think that it is not good enough in Conserve Soil Resources and Improve its Quality. Fig 8-16

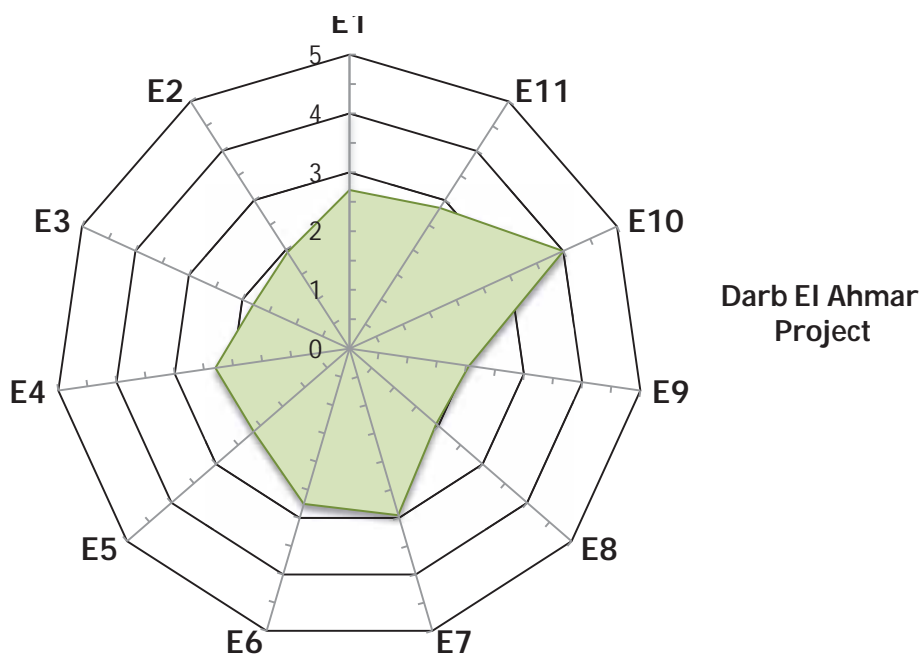


Figure 8-16 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).

Darb El Ahmar project is highly evaluated for social objective by users' participation, this project is very social recommended because it reduce anti-social activity, improve the education and skills of the population overall, but on the other hand the participants think that it is not good enough in improving accessibility for those most in need. Fig 8-17

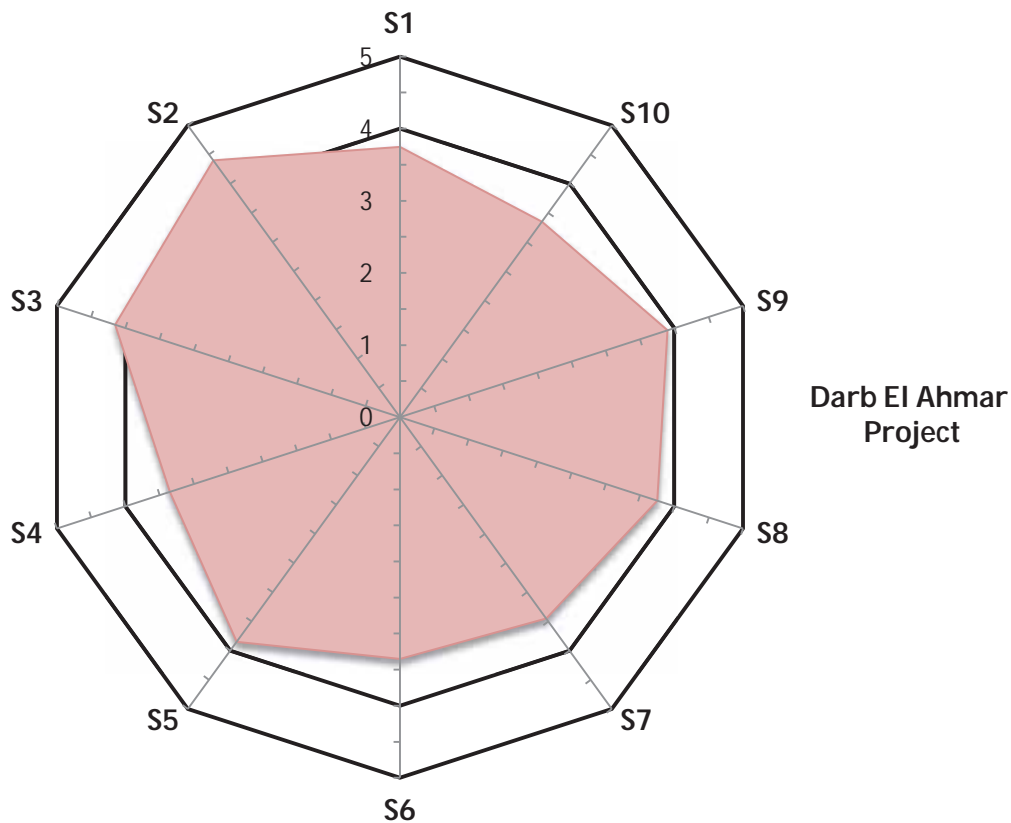


Figure 8-17 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Social objective).

Darb El Ahmar project was medium evaluated for economical objective by users' participation, this project is economical recommended because it enhances the image of the area as a business location, to improve the social and environmental performance of the economy, but on the other hand the participants think that it is not good enough in reduce disparities in economic performance. Fig 8-18

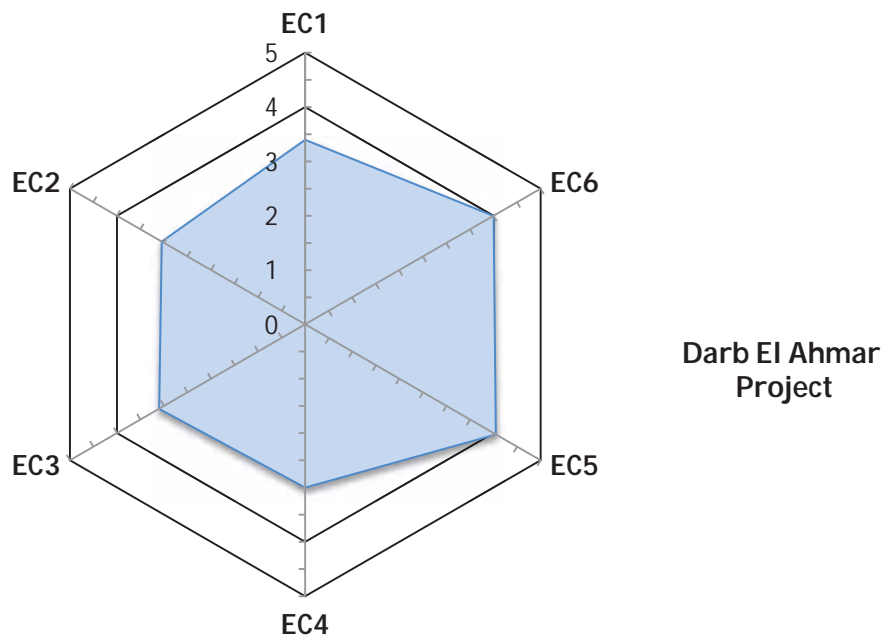


Figure 8-18 suggested format (Radar technique) for displaying how Darb El Ahmar project was evaluated by public users in the participation process in each sub-criterion (Economic objective).

Siwa Oasis project is highly evaluated for environmental objective by users' participation, this project is very Environmental recommended because it Reduce the Effect of Traffic on the Environment, Maintain and Enhance Biodiversity, Flora and Fauna, Conserve and Where Appropriate Enhance the Historic Environment, Maintain and Enhance The Quality of Landscapes and Townscapes, but on the other hand the participants think that it is not good enough in Conserve Soil Resources and Improve its Quality. Fig 8-19

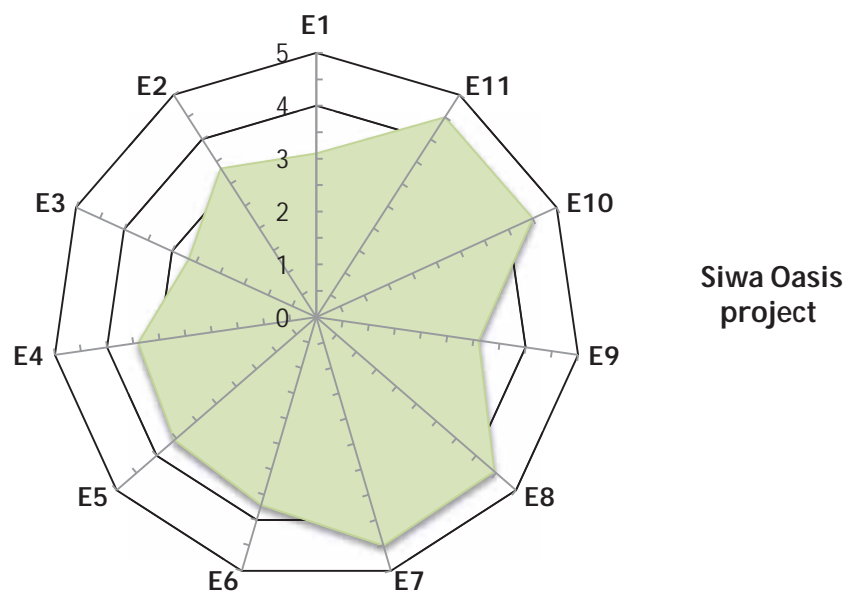


Figure 8-19 suggested format (Radar technique) for displaying how Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).

Siwa Oasis project is medium evaluated for social objective by users' participation, this project is social recommended because of its accessibility to essential services and facilities, improve the quality of where people live, improve accessibility for those most in need, but on the other hand the participants think that it is not good enough in offering everybody the opportunity for rewarding and satisfying employment. Fig 8-20

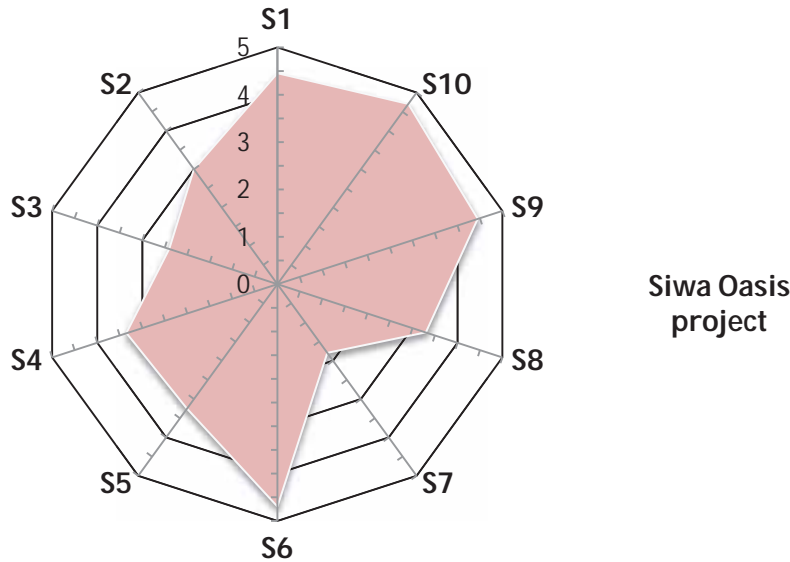


Figure 8-20 suggested format (Radar technique) for displaying Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Social objective).

Siwa Oasis project is medium evaluated for economical objective by users' participation, this project is economical recommended because it enhances the image of the area as a business location, to improve the social and environmental performance of the economy, but on the other hand the participants think that it is not good enough in reduce disparities in economic performance. Fig 8-21

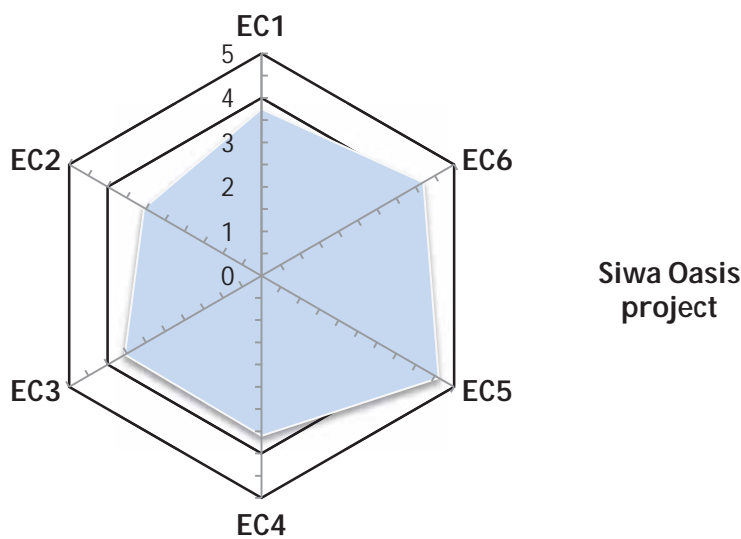


Figure 8-21 suggested format (Radar technique) for displaying how Siwa Oasis project was evaluated by public users in the participation process in each sub-criterion (Economic objective).

Esna City project is medium evaluated for environmental objective by users' participation, this project is Conserve and Where Appropriate Enhance the Historic Environment, Maintain and Enhance, The Quality of Landscapes and Townscapes, but on the other hand the participants think that it is not good enough in improving water quality. Fig 8-22.

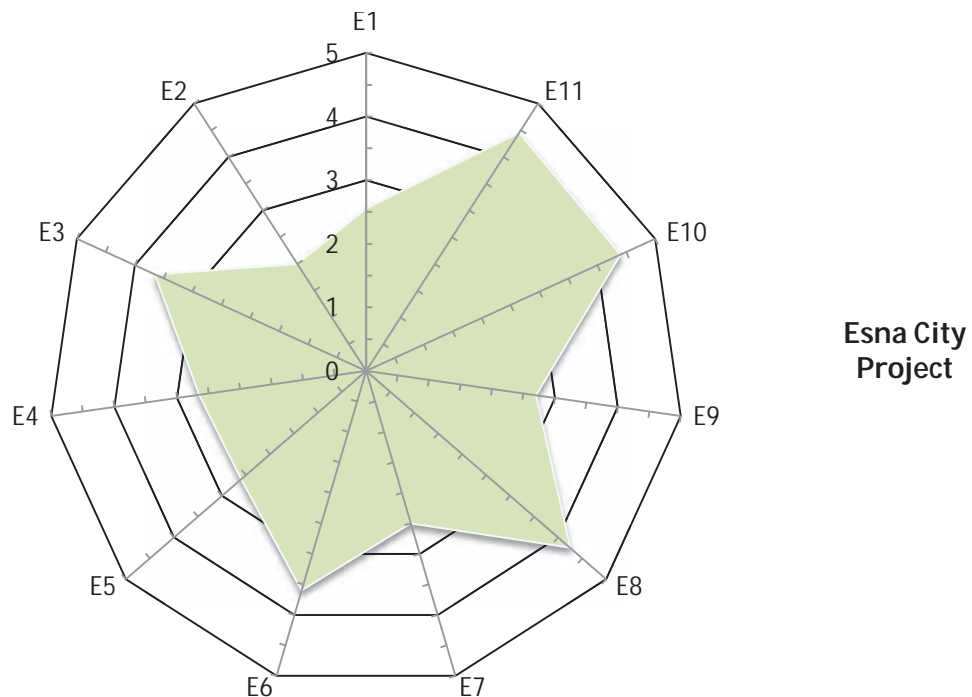


Figure 8-22 suggested format (Radar technique) for displaying how Esna City project was evaluated by public users in the participation process in each sub-criterion (Environmental objective).

Esna City project is highly evaluated for social objective by users' participation, this project is very social recommended because it improve the education and skills of the population overall, reduce poverty and social exclusion, improve the quality of where people live, but on the other hand the participants think that it is not good enough in improving accessibility to essential services and facilities. Fig 8-23.

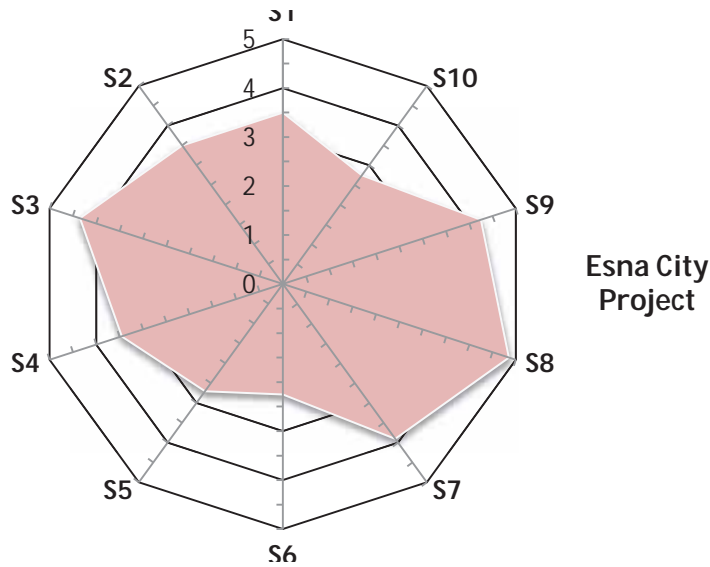


Figure 8-23 suggested format (Radar technique) for displaying how Esna City project was evaluated by public users in the participation process in each sub-criterion (social objective).

Esna City project is highly evaluated for economical objective by users' participation, this project is very economical recommended because To encourage sustained economic growth, To reduce disparities in economic performance, To encourage and accommodate both indigenous and inward investment, To encourage efficient patterns of movement in support of economic growth, To enhance the image of the area as a business location, To improve the social and environmental performance of the economy. Fig 8-24

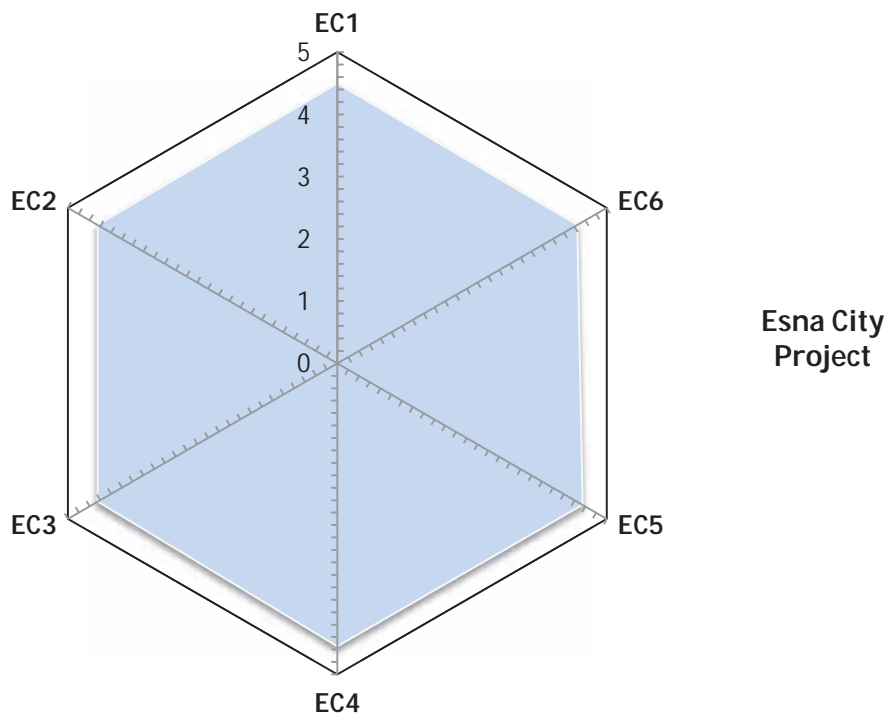


Figure 8-24 suggested format (Radar technique) for displaying how Esna City project was evaluated by public users in the participation process in each sub-criterion (Economic objective).

8.5 Conclusions

The analysis has found strong evidence that the sustainable objectives for culture heritage project are connected with each other. It demonstrates that towns and cities that are known for having historic environments are often highly regarded as places people want to visit and use economic benefit from it. This is shown in simple terms by a strong correlation between the three main objectives with each other.

In addition, historic buildings and places provide the opportunity for types of commercial activity that might otherwise not have the chance to develop. It, in particular, enables locally owned and unique businesses to operate. These are, depending on the circumstances, typically office and/or studio based businesses, hotels, shops and restaurants.

Chapter9- Computer Aided Sustainable Impact Assessment for Cultural Heritage Projects (CASIA_{CH})

- 9.1 Introduction
- 9.2 Applied Study Objectives
- 9.3 Limitation of the Study
- 9.4 The Assessment Tool
- 9.5 Assessment Tool Proto Type CASIACH
- 9.6 Case Study Gournia city Conservation.
- 9.7 Conclusion

9.1 Introduction

In the previous chapter a hypothetical design approach to improve and assessment sustainability in cultural heritage conservation projects was proposed. A major key of the efficiency of any assessment tool is its ability to be applied in the real context and its accurate results. In this chapter would mainly like to measure the ability of the proposed guide to specify how far the conservation of “culture heritage sites” from sustainability and to high light the right way to solve the causes of these deficiencies using its related sustainable indicators (mentioned in details in chapter 3). A good indicator alerts the designer to a problem before it gets too bad and helps to recognize what needs to be done to fix the problem. And proper indicators, in themselves, can produce results. In this chapter, the research will try to test the reliability of the approach, through an applied study to give the opportunity to evaluate the conservation of a specific culture heritage project in Egypt "Gourna City", in order to make an Impact Assessment for the whole Project. , and it is considered one of the few examples in Luxor city, the research will try to proceed the SIA frame work through a suggested program designed.

9.2 Applied Study Objectives

The applied study's objectives include two main objectives; the first is to test the applicability and reliability of the proposed approach, the second is to determine the efficiency of the proposed sustainable indicators and its ability to alert the designer to the deficiencies in the project. To achieve these goal some research tasks were discussed in the previous chapters:

- Determining and studying the approach field study (in chapter 5).
- Studying and analyzing culture heritage conservation projects, their objectives and their indicators (in chapter 6).
- Studying and determining Conservation evaluation criteria and sub criteria, in order to prepare evaluation criteria which can help in public participation process, then establishing a factor set for evaluation criteria and sub criteria (in chapter 7).
- Establishing a matrix between evaluation criteria, sub criteria and culture heritage projects indicators (in Chapter8).

9.3 Limitation of the Study

Constraints of the study will be as following:

9.3.1 Scope:

The scope of study will be aimed at the cultural heritage projects and its related sustainable conservation objectives. There are three main objectives in which culture heritage conservation can receive credits under our technique, including environmental, social and economic.

9.3.2 Phase of application

The applied study will be applied at the end of the conservation effort and before the phase of application, that the proposed guide will be used as a Tracking Tool. As mentioned before that the Stakeholders can use the same indicators approach throughout the design implementation to continually determine whether the conservation project is on track or not.

9.3.3 Levels of evaluation

It seems important to distinguish between information required to perform a comparative analysis (alternatives) from that required to explain how far the design (End result) from sustainability. Economic, environmental and social analysis will be in scope of work as they give relative numbers which is not metric but relative quantitative index for selecting between alternatives, or to give the significance of the effect of each sub objective. The study will be limited to measure the sustainability Effects predictions as generally broad-brush and qualitative values, e.g. be mildly negative, on a scale from strongly positive (++) to strongly negative (--).

9.4 The Assessment Tool

Assessment tool which should help end-users (political authorities, planning bodies, developers, consultants, interested stakeholders etc.) to choose an environment procedure which is adapted to their specific situation and which allows to take into consideration sustainable conservation objectives (ecological, economic, social and cultural). It follows the rules and prescriptions of SIA and integrates experience from realized assessments. It assists users by leading them through a series of steps which are

compulsory or not. At each step actions can be defined to specify the content and the results of the assessment. Assessment tool does not assist in the execution of the steps which are executed by specialists (consultants, public authorities).

9.4.1 Flexibility

This tool is designed to adapt to different national and regional situations and contexts. Although it includes all the existing steps and partial steps which could be found in EIA procedures as well as supplementary steps particular for sustainable development and urban cultural heritage, it can be customized for specific situations and contexts (generally by selection). The objectives can be chosen from existing lists or templates (by selection) or they can be defined from scratch. Limit and target values must be chosen explicitly. The responsibility for the execution of a chosen action must be defined by the users. It is possible to add comment to all actions.

9.4.2 Distributed

The assessment tool will be a web based tool allowing distributed applications. This will also permit to integrate additional modules and features and to build a database of finished assessments which can serve in the future as partial or full templates for new assessments.

9.4.3 Implementation of SIA Procedures in Assessment Tool

The assessment tool is intended to be used quickly by people with the qualifications and experience typically found in competent authorities, and using the information, which is readily available about the project and its environment. It is intended to produce an individual information guideline protocol, how to carry out an SIA for a plan or a project.

The user will find his way through the SIA procedure by navigating step by step through the assessment tool surface getting information about each single step, about the methods, possibilities, and necessities he has to consider, about specialists he has to consult and knowledge he do not have and has to take into consideration. Assessment tool supports the conduction of SIA, which are processes with several important purposes. They are an aid for decision-making. For the decision-maker, for example the local authority, they provide a systematic examination of the consequences of a proposed action, and sometimes alternatives, before a decision is taken.

SIA is normally wider in scope and less quantitative than other techniques, such as cost-benefit analysis. It is not a substitute for decision-making, but it does help to clarify some of the trade-offs associated with a proposed development action, which should lead to more rational and structured decision-making. The SIA process has the potential to be a basis for negotiation between the developer, public interest groups and planning regulator. This can lead to an outcome that balances the interests of the development action and the urban environment. Many developers no doubt see SIA as another hurdle for them to jump in order to proceed with their activities; the process can be seen as yet another costly and time-consuming activity in the permission process. However SIA can be of great benefit to them since it can provide a framework for considering location and design issues and environmental issues as parallel. It can be an aid to the formulation of development actions, indicating areas where the project can be modified to minimize or eliminate altogether the adverse impacts on the environment. SIA can be the signal to the developer of potential conflict; developers may use the process to negotiate solutions that may eliminate or offset negative environmental impacts, reduce local opposition and avoid costly public inquiries. The consideration of environmental impacts early in the planning life of a development can lead to environmentally sensitive development.

The assessment tool may offer a possibility to structure the process and to make the decision process transparent for all concerned parties. It may guarantee a certain standard of necessary steps, which have to be considered by the conducting party. Therefore it will be easier for the reviewing authority to assess the result of such an assessment even if a (voluntary) SIA may be done by a private sector developer.

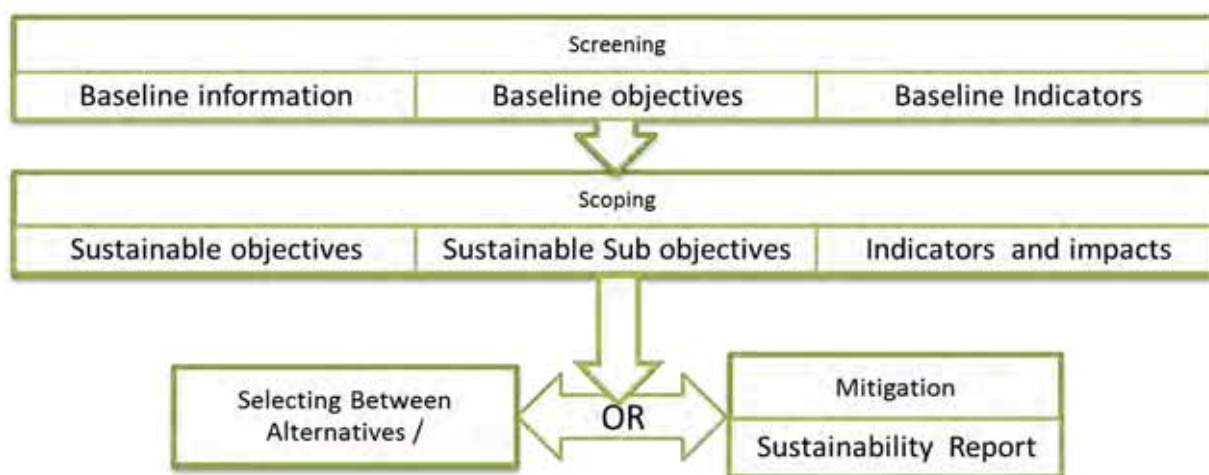


Figure 9-1 The SIA Tool Interacting steps

Several interacting steps typify the early stages of the SIA process. These include deciding whether an SIA is needed at all (screening), consulting with the various parties involved to seek to produce an initial focus on some of the key impacts (scoping), and an outline of possible alternative approaches to the project, including alternative locations, scales and processes. Scoping and alternatives can greatly improve the quality of the process. Early in the process the analyst will also wish to understand the nature of the project concerned, and the environmental baseline conditions in the likely impacted area. Projects have several dimensions (e.g. purpose, physical presence, processes and policies, over several stages in the project life cycle); a consideration of the baseline also involves several dimensions. For both projects and the impacted environment, obtaining relevant data may present challenges.

The assessment tool should assist the professional user in managing the assessment process, which is determined by all those connections. Tool ties the links between the consideration of the sustainability baseline, the procedural steps of the assessment, necessary tools, methods and conducting specialists and provides necessary information.

9.4.4 Structure of Assessment Tool

The system is composed of several (hierarchical) levels. All operations (at all levels) have an identical structure: **Assessment tool** is composed of Fig9-2

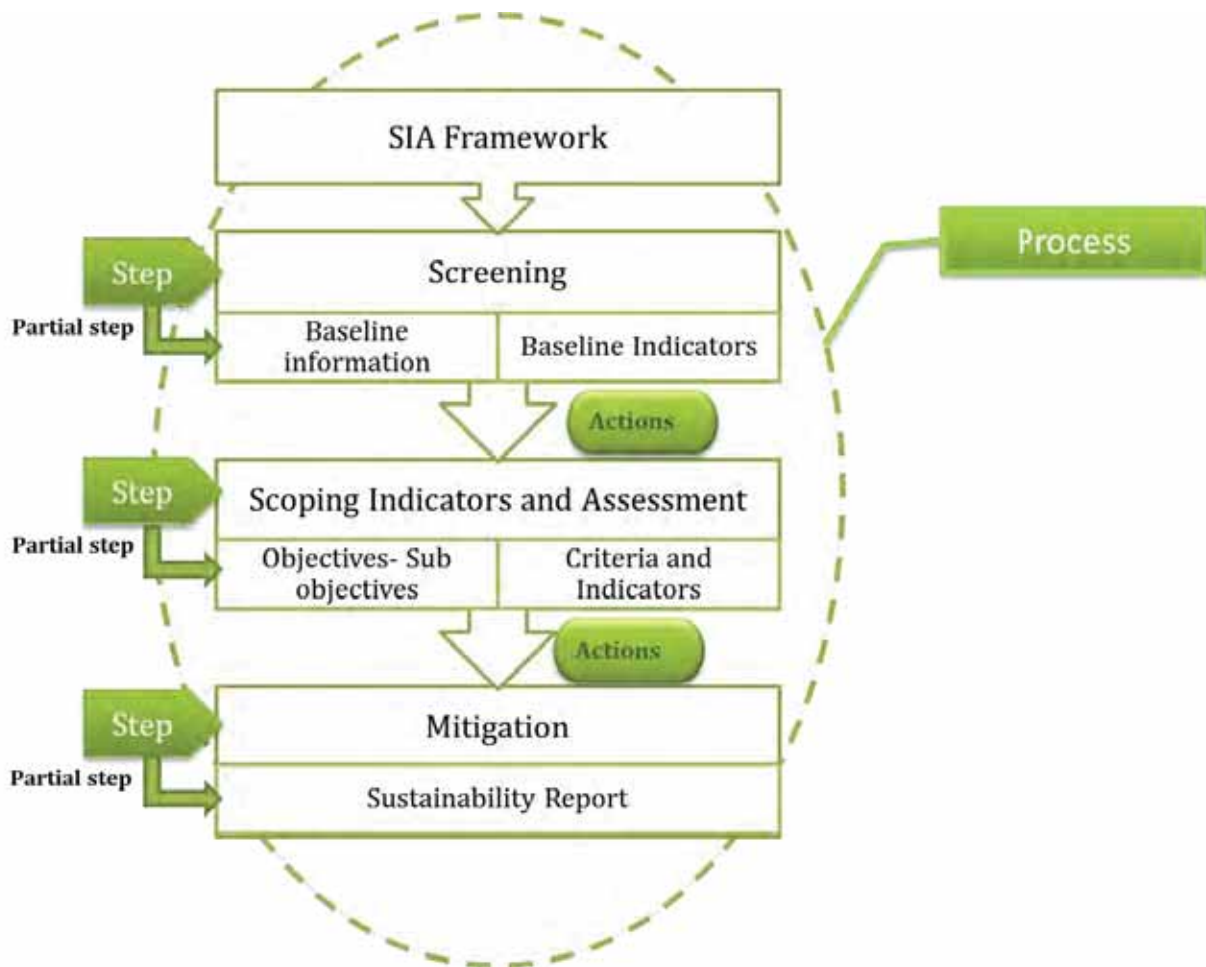


Figure 9-2 the system hierarchy levels.

At each level (process, step, partial step, action) there are different further possibilities:

Navigation

- go to preceding operation (level)
- go to next operation – skip (level)
- go back to first operation in level
- go to a specific other operation
- show situation in the process (map)
- show history of operations

Information available at each operation

- definition of the operation
- methods available

- target values available
- examples (case studies)
- literature, references, standards

Results

- place an operation in the procurement report
- remove an operation from the procurement report
- add comment to option
- produce report
- show report
- save report
- print report

Examples of Options

- Define an objective
- Define an indicator
- Define an assessment procedure
- Define an information & participation procedure

Component of CASIA_{CH}

- Input (fields)
- Procedure (in fact succession of process, steps and actions which refer to the content of the database)
- Data base (containing texts, images, tables, values)
- Output (presentation, saving and printing of documents)
- Workbench (for specialised users only :
- Definition of new operations (process, steps, partial steps, actions)
- Modification of existing operations
- Input in data base
- Modification of content of data base

9.5 Assessment Tool Proto Type CASIA_{CH}

The tool Prototype is a web database application that is based on *three-tier architecture*. This combination provides cheap ubiquitous access to the functions and information integrated in CASIA_{CH} via internet. It has an existing user base with standardized web browser software that runs platform independent on ordinary computers. For further developers, web server software is freely available responding to requests for documents and programs.

This Tool is built around a three-tier architecture model, shown in Fig.9-3 . At the base of the application is the database tier, consisting of the database management system that manages the database containing the data users query. In this underlying stage are also dedicated folders that contain information objects. Built on top of the database tier is the complex middle tier, which contains most of the application logic and communicates data between the other tiers. On top of this is the client tier, usually web browser software that interacts with the application.

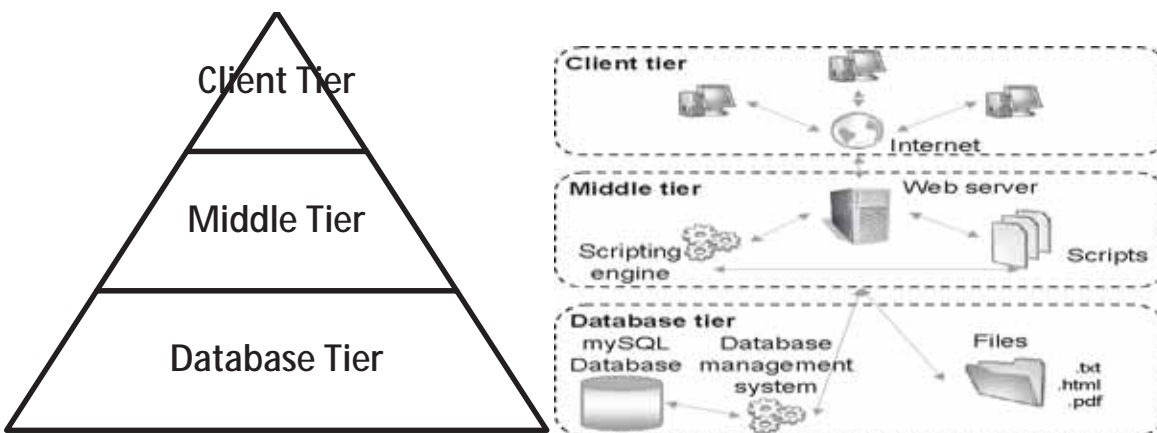


Figure 9-3 the architecture model for program.



Figure 9-4 Start screen of the CASIA_{CH} tool

After the welcome screen Fig.9-5, CASIA_{CH} gives a general overview of the content the program provides. Here the user can get a quick overview of the several steps and their content.

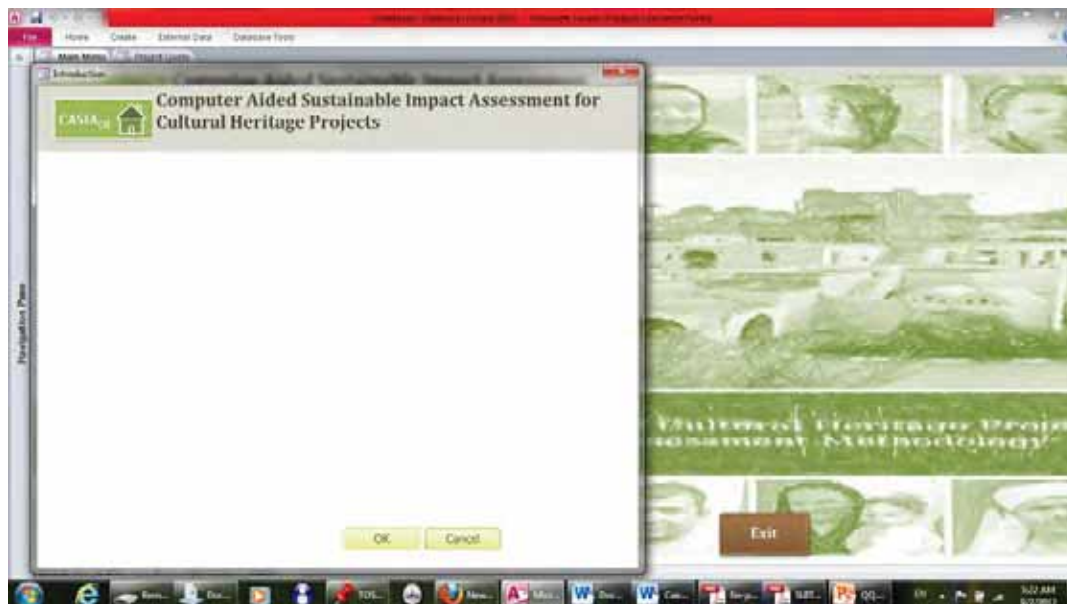


Figure 9-5 Introduction to the several possible cases in CASIA_{CH}

CASIACH provides several different cases for the establishment of a planning framework. Before the first step the user has to decide which case he selects and what the trigger is in his project. Fig. 9-6 the two cases are:

- Case 1: Project/Design and three suggested alternatives.

- Case 2: Impact Assessment for Project Conservation which was carried out then monitoring (according to the planning framework) detects any significant change; an SIA will be released by the end report.

A screen will appear, and the participant has to fill in some demographical information; name, phones, e-mail, job title, then he has to choose either Case1 or Case2 Fig 9-7.

The screenshot shows a web browser window titled 'welcome screen Query2'. The main heading is 'welcome Please enter your Personal Data'. On the left, there is a list of labels: ID, Name, E-mail, Job Title, and Phone. To the right of these labels are input fields. The ID field contains '(New)'. Below the input fields are two buttons labeled 'Case 1' and 'Case 2'. At the bottom of the window, there is a search bar and some navigation icons.

Figure 9-6 Personal Information and Selecting the Case.

When Case1 is pressed project information entry will appear. Fig9-8.

The screenshot shows a web browser window titled 'Project Query'. The main heading is 'Please Enter Project Information'. On the left, there is a list of labels: Project Name, Project ID, Street Address, City, Date Conserved, Date Ended, and Conservation Organization. To the right of these labels are input fields. Below the input fields are three buttons labeled 'Alternative 1', 'Alternative 2', and 'Alternative 3'. The window is overlaid on a desktop environment with a taskbar at the bottom.

Figure 9-7 project Information Entry Screen for Case1

The participant should evaluate each point with range from excellent to poor, where (excellent is 5, good is 4, neutral is 3, fair is 2, poor is 1), participant should answer all the points, if he did not do that he we not be able to move to the next page. Fig 9-9. After finishing the first evaluation, warning screen appears, to inform the participant that he finish this section and will move to the next alternative.



Figure 9-8
Then after evaluating the three Alternatives a comparative table will be shown

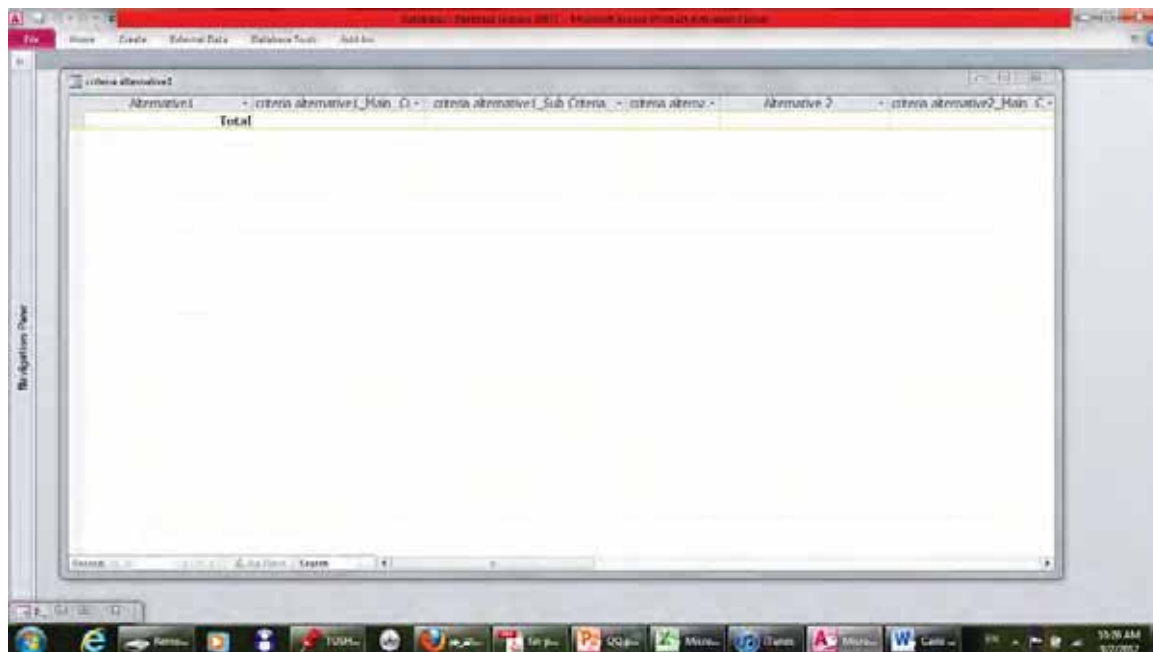


Figure 9-9
Then a final report will be given and it can be printed also

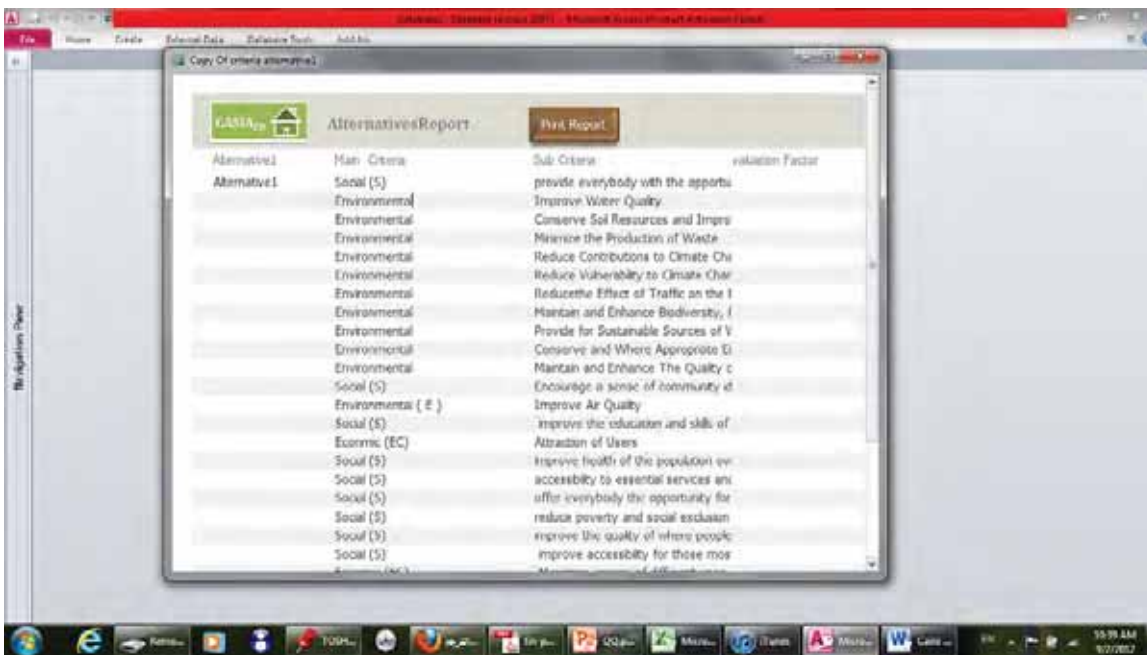


Figure 9-10 the alternative final report

When Case2 is pressed in fig 9-7 . Project information entry will appear. Fig9-12

9.6 Case Study Gournia city Conservation.

- Location: Luxor on the West Bank of the Nile River, within the World Heritage property of Ancient Thebes in Egypt.
- Project Type: conservation for cultural heritage village.
- Designed and built between 1946 and 1952 by the famous Egyptian architect Hassan Fathy (1900-1989).
- World Heritage List: Although New Gournia is situated inside the boundary of the World Heritage Property of Ancient Thebes with its Necropolis (inscribed in 1979 on the World Heritage List).



Figure 9-11 Gournia city

9.6.1 Historical back ground

It was created to shelter the community of Old Gournia (*Gournii*) who had lived above the tombs in the ancient cemetery of Thebes and whose relocation was considered as a solution to reduce the damages to the Tombs of the Pharaonic period. The main characteristics of New Gournia village consist of its reinterpretation of a traditional urban

and architectural setting, its appropriate use of local materials and techniques, as well as its extraordinary sensitivity to climatic problems. It demonstrated, within the era of “modern movement” that sustainability and social cohesion could also be met with vernacular architectures, local materials and techniques. For this reason, it is an outstanding example of sustainable human settlement and appropriate use of technology in architecture and planning. Exposed in one of the major architecture and planning references, *Architecture for the Poor: An Experiment in Rural Egypt* by Hassan Fathy, published in 1973, these ideas inspired a new generation of architects and planners worldwide through an integration of vernacular technology with modern architectural principles.

9.6.2 Baseline information

One of the fundamental goals of the proposed UNESCO initiative is to valorize the pioneering ideas and philosophy of Hassan Fathy’s work and to reinforce its relevance to contemporary sustainability concerns. Fathy’s tenets derived from humanistic values about the connections between people and places and the use of traditional knowledge and materials especially the exceptional advantages of earth as full-fledged construction material. New Gournā was a critical experiment in the implementation of that philosophy. Thus, the safeguarding of New Gournā is about more than just preserving its original design and fabric but also about promotion, communication and education.

Another important project focus lays on restoration and management concerns. The alteration and destruction of original structures and features are ongoing. The degraded state of conservation of New Gournā becomes evident through the destruction and collapse of major buildings due to lack of maintenance. Urgent restoration measures are needed to stop irreversible changes and loss. The number of original mud brick houses in Hassan Fathy’s Gournā is considerably reduced. The few public buildings such as the Khan and the market are in danger of collapse and the remaining open spaces are more and more encroached. The lack of infrastructure and maintenance of public facilities thus constitutes an important threat to the village as well as the ongoing very intense construction activity with reinforced concrete pillars in inconsistent out-of-scale buildings.

9.6.3 Phase of application

The case study will be applied at the end of a survey effort and before the Mitigation phase, which the application will be on screening and Scoping stage. As mentioned before that the Stakeholders can use the same indicators approach throughout the conservation implementation to continually determine whether the project is on track or not.

9.6.4 The Levels of Evaluation for CASIA_{CH}

It seems important to distinguish between information required to perform a comparative analysis (alternatives) from that required to explain how far the project (End result) from sustainability. This is what meant by Case2 in CASIA_{CH}. Fig9-12

Figure 9-12 Application of Case2.

Then project data will be entered as in Fig 9-13

Figure 9-13 Project Data entry

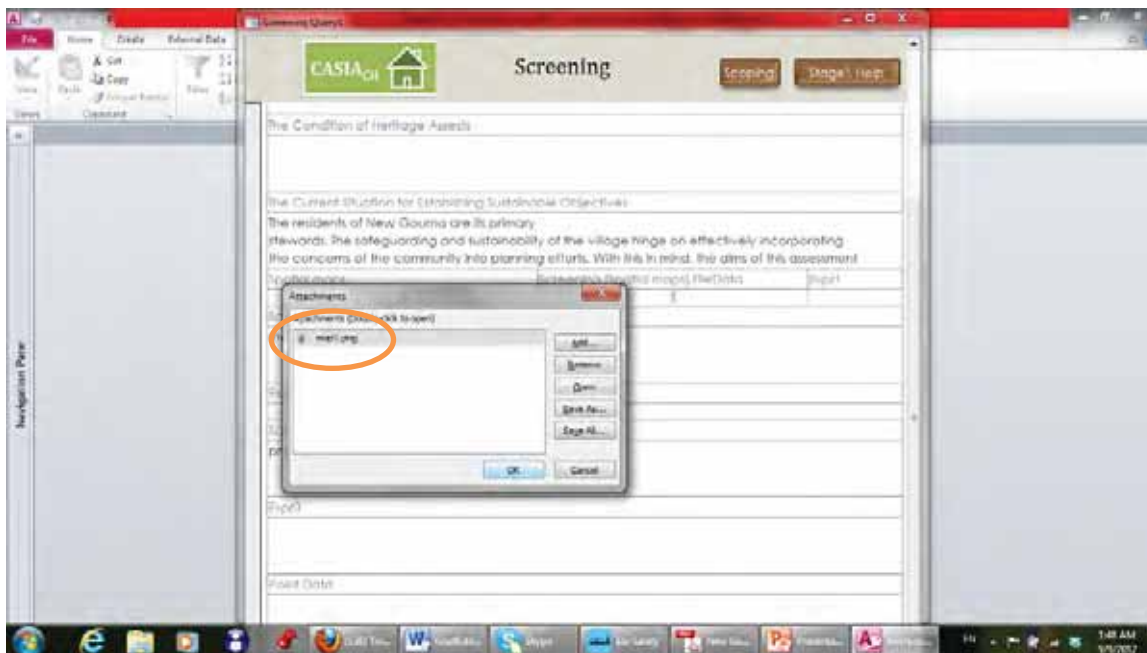
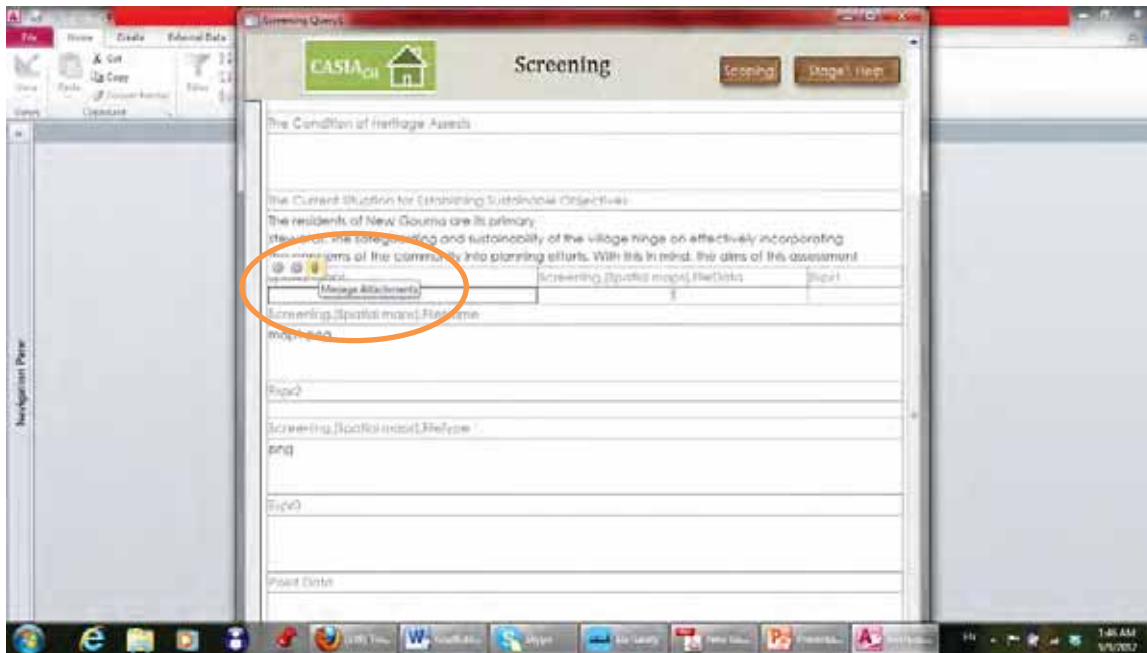


Figure 9-14 attaching files in Screening Stage.

All base line information is stored as data base

Then Scoping stage will start in the assessment of the project. Fig 9-15.



Figure 9-15

A final report will be printed showing the total assessment for whole project.

9.7 Conclusion

CASIA_{CH} uses three different levels of application that can be alternated without influencing each other. The first level is the underlying information stored in different text-based files. These files can easily be modified with a text-editor without understanding the implementation structure. The second level is the navigation surface that can be adjusted separately. The third level is the scripting part. It is made in English and is not accessible for the general user. The different levels of application ensure the best possible solution for a user. Whereas individual contents can be easily modified by everyone, the general structure of the tool demands profound computing knowledge to change the settings.

The content is kept in folders in ordinary file types that can be modified with simple text tools. It is also possible to change the files if the information background changes. The content of these files is directly integrated in the output files that the php scripting engine displays on the user screen.

Chapter10

Conclusions and Recommendations

10.1 Conclusions

Through the theoretical and the practical study of the thesis, the following Conclusion points were reached:

10.1.1 Conclusions about Impact Assessment

- Sustainable development aspects (long term, intergenerational justice etc.) cannot be considered without fundamentally changing the procedure of using the Impact assessment, The EIA process starts too late in the development process.
- Project for EIAs have a partially bad reputation (expensive, time extensive, unsuccessful)
- Conservation development project forces greater consideration for the indicators to clarify the objectives and logic of the program.

10.1.2 Conclusions about Conservation

- So much experience of conservation has been gained, that it is now possible to speak of a "philosophy of conservation" which is generally applied through the world. Briefly this aims to interfere with the surviving building as little as possible and in particular, to avoid replacing the unique qualities produced by time in an ancient monument with those qualities associated with a new building. These aims are in conflict with the need to find a means of keeping an aging fabric standing, often in the face of problems entirely unforeseen by the original builders, as is the case in Cairo. This can only be resolved by thought, skill and patience which need understanding, training, experience and time.
- Cultural Heritage aspects are hardly included or exclusively related to individual listed monuments.
- The historic environment, and specifically the maintenance and repair of traditional buildings, has a fundamental role to play in maintaining the environmental quality of many towns and cities across Egypt, which in turn, plays a particularly important role in attracting tourists to a given locality (thereby supporting businesses in other sectors, such as retail). It also plays a positive role in creating well-being for people living, or simply passing through, attractive, well maintained historic townscapes.
- On a national level, the importance of maintaining historic buildings (particularly clusters of historic buildings/townscapes) is reflected in some of the grant programmes being delivered by core organizations within the historic environment

sector. It is notable that many small grant projects have also stimulated significant levels of investment amongst private sector property owners in maintaining and repairing historic buildings.

- The case studies have also emphasized the role that heritage can play in delivering environmental enhancements to historic townscapes. For example, through the Azhar Park Project, the renovation of former decaying historic buildings, along with associated public realm enhancements, is playing an integral role in improving the city's physical environmental fabric.
- The maintenance of historic buildings also plays an important role in improving the environmental quality of surrounding areas, which in turn plays a key role in supporting and conserving biodiversity. The Siwa Oasis case study, for example, demonstrates the role that renovating existing traditional buildings can play in reducing the pressure to develop new buildings on greenfield sites.

10.2 Recommendations

Through the theoretical and the practical study of the thesis, the following recommendation points were reached:

10.2.1 Recommendations for SIA frame work

- SIA has been criticized because it is argued that the decision is very often in favor of the developer because he is who that normally pays for this study. For that reason it is strongly suggested to utilize an independent panel of experts who will analyze the SIA and make a corresponding and unbiased analysis and appropriate recommendations.

10.2.2 Recommendations for Future Data Collection and Monitoring the Importance of Historic Environment

- Constraints of the current study have meant that primary research has necessarily been restricted, the assessment having been largely reliant on secondary data sources and findings of existing surveys, supplemented by evidence from stakeholder consultations. Indeed, the research process has identified a series of gaps in the existing evidence base, particularly relating to shortages in sub-national level data, and data relating to individual heritage assets/ specific groups of assets.

The research would therefore make a number of specific forward recommendations in respect of enhancing the quality of the evidence base which can be made available to the Heritage Council and, in turn, better inform future management and investment decisions. To further facilitate the ongoing monitoring of historic environment and its importance to national and sub-national economies it should be desirable to improve data collection in a number of key areas. These include:

10.2.3 Recommendation to be considered in Identification and Designation of the Historic Environment

- While a number of organizations and data sets provide information on Egyptian historic environment, it is the case that there is considerable variation in the way that data corresponding to different historic asset types is collected and compiled. It is notable for example that there is currently no central record pertaining to the number, scale and geographical breakdown of Architectural Conservation Areas and Protected Structures (with regular applications being submitted for additional buildings/townscapes to receive designation). Although, to date, research regarding the location and distribution of these assets has been carried out for quite a number of Egyptian culture heritage sites, the survey remains incomplete and offers partial coverage at the national level. Similarly, nationally collected information on the condition of the historic environment is deficient, though the presence of management plans and inspection regimes for assets means a considerable amount is known locally.
- It is desirable for the sector to establish a more complete and integrated set of centrally held records - providing, in one place, essential information that is of practical use for the sector in managing Egypt's historic environment. Through a programme of arrangement and integration of existing data holdings supplemented where possible by any outstanding survey work required for specific territories, a valuable resource outcome would involve production of a national compendium database, ultimately providing heritage partners with Egypt-wide coverage for historic assets, and including key characteristics connected to asset type, designation and condition. If this information were to be made available in digital format and appropriately geo-coded then this would

constitute a particularly powerful database resource, and would enable GIS mapping and other spatial analysis data applications.

10.2.4 Recommendation to be considered in Resourcing and Investment Activity

- A considerable range of organizations and individuals are involved in caring for Egypt's historic environment like CULNAT. The associated management information can be informative about the scale of investment in the sector, together with the effectiveness of general management of the historic environment. While it is possible to develop approximate estimates corresponding to public investment in the sector based on published management information for core heritage organizations, presently, there remains a number of notable deficiencies in the compilation of such resourcing and investment data.
- One particular area of limited information relates to the resourcing and investment of local authorities for the historic environment in Egypt. Given the importance of the role local authorities play in managing the historic environment, and the fact that local authority areas vary considerably in terms of their population, land area and distribution of historic environment assets, it is currently very difficult to compile reliable and consistent information for local authority resourcing and funding of historic environment related activities. This is likely to be further complicated given that responsibilities may be distributed across a number of service areas within individual local authorities. As a basis for collecting further core data on local authority resourcing and investment we would suggest the commissioning of separate survey research covering Egyptian local authorities. This could take the form of a questionnaire survey and would be designed to cover key items of staffing, expenditure and income, and relevant management information in connection with the historic environment.

10.2.5 Recommendation to be considered in Enhancements to economic data

- Looking forward, and for the purpose of seeking to further refine any future impact assessments of the sector, including in terms of local and regional breakdowns, there are a number of enhancements to existing economic data that would likely be needed. One key area relates to data associated with the built heritage construction sector. While existing industry data corresponding to

expenditure on repair, maintenance and improvement may be used to provide proxy estimates of the overall value of the construction sector attributable to the historic environment (including the greater part of total private sector investment), this data is restricted in terms of its breakdown or granularity.

Appendix

Appendix A. Criteria for Outstanding Universal Value

Appendix B. Criteria for Inclusion on the List of World Heritage in Danger

Appendix C Online Survey

Appendix D Gournna Maps

Appendix A. Criteria for Outstanding Universal Value

Source: “Operational Guidelines for the Implementation of the World Heritage Convention,” January 2008, pp. 20-21.

“The [World Heritage] Committee considers a property as having outstanding universal value if the property meets one or more of the following criteria. Nominated properties shall therefore:

- i) represent a masterpiece of human creative genius;
- ii) Exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town planning or landscape design;
- iii) Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- iv) Be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);
- vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- viii) to be outstanding examples representing major stages of earth’s history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- ix) to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; and

x) to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.”¹

¹ The Operational Guidelines are available URL: <http://whc.unesco.org/en/guidelines/>

Appendix B. Criteria for Inclusion on the List of World Heritage in Danger

Source: “Operational Guidelines for the Implementation of the World Heritage Convention,” January 2008, pp. 48-49.

“Criteria for Cultural Sites—List of World Heritage in Danger

Ascertained danger:

- i) serious deterioration of materials;
- ii) serious deterioration of structure and/or ornamental features;
- iii) serious deterioration of architecture or town-planning coherence;
- iv) serious deterioration of urban or rural space, or the natural environment;
- v) significant loss of historical authenticity;
- vi) important loss of cultural significance; or

Potential danger:

- i) modification of juridical status of the property diminishing the degree of its protection;
- ii) lack of conservation policy;
- iii) threatening effects of regional planning projects;
- iv) threatening effects of town planning;
- v) outbreak of threat or armed conflict;
- vi) gradual changes due to geological, climatic, or other environmental factors.”

“Criteria for Natural Sites—List of World Heritage in Danger

Ascertained danger:

- i) A serious decline in the population of the endangered species or the other species of outstanding universal value for which the property was legally established to protect, either by natural factors such as disease or by man-made factors such as poaching;
- ii) Severe deterioration of the natural beauty or scientific value of the property, as by human settlement, construction of reservoirs which flood important parts of the property, industrial and agricultural development including use of pesticides and fertilizers, major public works, mining, pollution, logging, firewood collection, etc.;
- iii) Human encroachment on boundaries or in upstream areas which threaten the integrity of the property; or

Potential danger:

- i) a modification of the legal protective status of the area;
- ii) planned resettlement or development projects within the property or so situated that the impacts threaten the property;
- iii) outbreak or threat of armed conflict;
- iv) the management plan or management system is lacking or inadequate, or not fully implemented.”¹

¹ Additional factors the World Heritage Committee may wish to take into account when considering adding a site to the Danger List are listed on page 50 of the “Operational Guidelines for the Implementation of the World Heritage Convention,” January 2008.

Appendix C Online Survey

دور المعايير المستخدمة من أجل حفاظ مشاريع التراث الثقافي

هذا الاستبيان جزء من بحث مقدم كجزء من متطلبات الحصول على درجة الدكتوراه في الفلسفة في الهندسة المعمارية والهدف من هذه الرسالة هو اقتراح إجراء إطار منهجي متكامل لتقييم الأثر المستدام لمشاريع حفاظ التراث الثقافي. نحن نقدر اخذك جزء من وقتك لملء الاستبيان الخاص بنا.

(Personal information (optional)

1. الرجاء ترك اسمك وعنوانك البريدي حتى نتمكن من الحصول على اتصال معكم:

الاسم

البريد الإلكتروني

الدرجة العلمية

[التالية](#)

1/4

دور المعايير المستدامة من أجل حفاظ مشاريع التراث الثقافي

2. المشروع الذي سوف تقيمه

3. ما التصنيف العام لحالة المشروع قبل التطوير؟ *

- ضعيف
 متوسط
 جيد
 جيد جدا
 ممتاز

4. ما التصنيف العام لدرجة الاستدامة تعطيتها لهذا المشروع بعد التطوير؟ *

- ضعيف
 متوسط
 جيد
 جيد جدا
 ممتاز

5. الاهداف البيئية

يرجى الإشارة الى مستوى الاتفاق مع العبارات التالية: *

أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين جودة الهواء
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين نوعية المياه
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحفاظ على موارد التربة ولوعيتها
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من إنتاج النفايات
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من المسافرات في تغير المناخ
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من التعرض لتغير المناخ
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من تأثير حركة المرور على البيئة
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على مسافة وتعزيز التنوع البيولوجي، والحياة البرية والحيوية
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على توفير مصادر مستدامة للمياه "بعض استهلاك المياه"
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحفاظ وعت الإقضاء تعزيز البيئة التاريخية
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على مسافة وتحسين نوعية المنظر الطبيعية ومنظر المسيلة

دور المعايير المستدامة من أجل حفاظ مشاريع التراث الثقافي

6. الاهداف الاجتماعية للمشروع

يرجى الإشارة إلى مستوى الاتفاق مع العبارات التالية: *

أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تشجيع الشعور بالهوية المجتمع والرفاه
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من الشغل المعنى للمجتمع
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين التعليم والمهارات من إجمالي عدد السكان
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على توفير الجميع فرصة للعيش في منزل لائق
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين الصحة من إجمالي عدد السكان
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين فرص الحصول على الخدمات الأساسية والمرافق
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تعزيز فرص مجزية للعمل ومرتبة للجميع
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من الفقر والاستبعاد الاجتماعي
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين نوعية حيث يعيش الناس
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين إمكانية الوصول إلى من هم في حاجة

7. الاهداف الاقتصادية للمشروع

ويرجى بيان مستوى الاتفاق مع العبارات التالية *

أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تشجيع النمو الاقتصادي المستدام
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على الحد من التفاوت في الأمان الاقتصادي
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تشجيع واستيعاب الاستثمار على حد سواء الأصلية والداخل
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تشجيع أنشط فعالة من الحركة في دعم النمو الاقتصادي
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين صورة المنطقة كموقع الأعمال
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	المشروع ساعد على تحسين الأمان الاجتماعي والبيئي للاقتصاد

Sustainable dimension for Urban Heritage conservation - Mozilla Firefox

File Edit View Hgtry Bookmarks Tools Help

(1) Facebook مكنوب (Yahoo!) Survis > Survey List Sustainable dimension for Urban Heritage... x

www.surveymonkey.com/survey/3TTKWSSE9XV/3?wosid=CvXVnNK3YUoZo8YySLWH0

Search Facebook Search 29°C Search Music Games CS

You are currently previewing this survey. No responses will be collected.

Sustainable dimension for Urban Heritage conservation

We really appreciate that you have taken the time to fill out our survey.

Personal information (optional)

1. Please leave your name and email so we can get in touch with you:

Name:

Email address:

Scientific degree

[Next >](#)

1/4

start Cairo Universit5... الفصل التاسع (Re... casesstudy Fulltext.pdf (SEC... Sustainable dime... Untitled page - Mi... EN 5:40 PM

Sustainable dimension for Urban Heritage conservation

2. Please enter the name of the project you're evaluating: *

3. What is the overall rating for the sustainability would you give the project? *

- Poor
- Average
- Good
- Very Good
- Excellent

4. Please indicate your level of agreement with the following statements: *

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Project improve air quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve water Quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project conserve soil resources and quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project minimize the production of waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce contributions to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce vulnerability to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce the effect of traffic on the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project maintain and enhance biodiversity, flora and fauna	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project provide for sustainable sources of water supply "Reduce water consumption"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project conserve and where appropriate enhance the historic environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project maintain and enhance the quality of landscapes and townscapes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sustainable dimension for Urban Heritage conservation

5. Please indicate your level of agreement with the following statements: *

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Project encourage a sense of community identity and welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce anti-social activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve the education and skills of the population overall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project provide everybody with the opportunity to live in a decent home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve health of the population overall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve accessibility to essential services and facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project offer everybody the opportunity for rewarding and satisfying employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce poverty and social exclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve the quality of where people live	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project improve accessibility for those most in need	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Economic criteria Please indicate your level of agreement with the following statements: *

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Project encourage sustained economic growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project reduce disparities in economic performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project encourage and accommodate both indigenous and inward investment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project encourage efficient patterns of movement in support of economic growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Project enhance the image of the area as a business location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

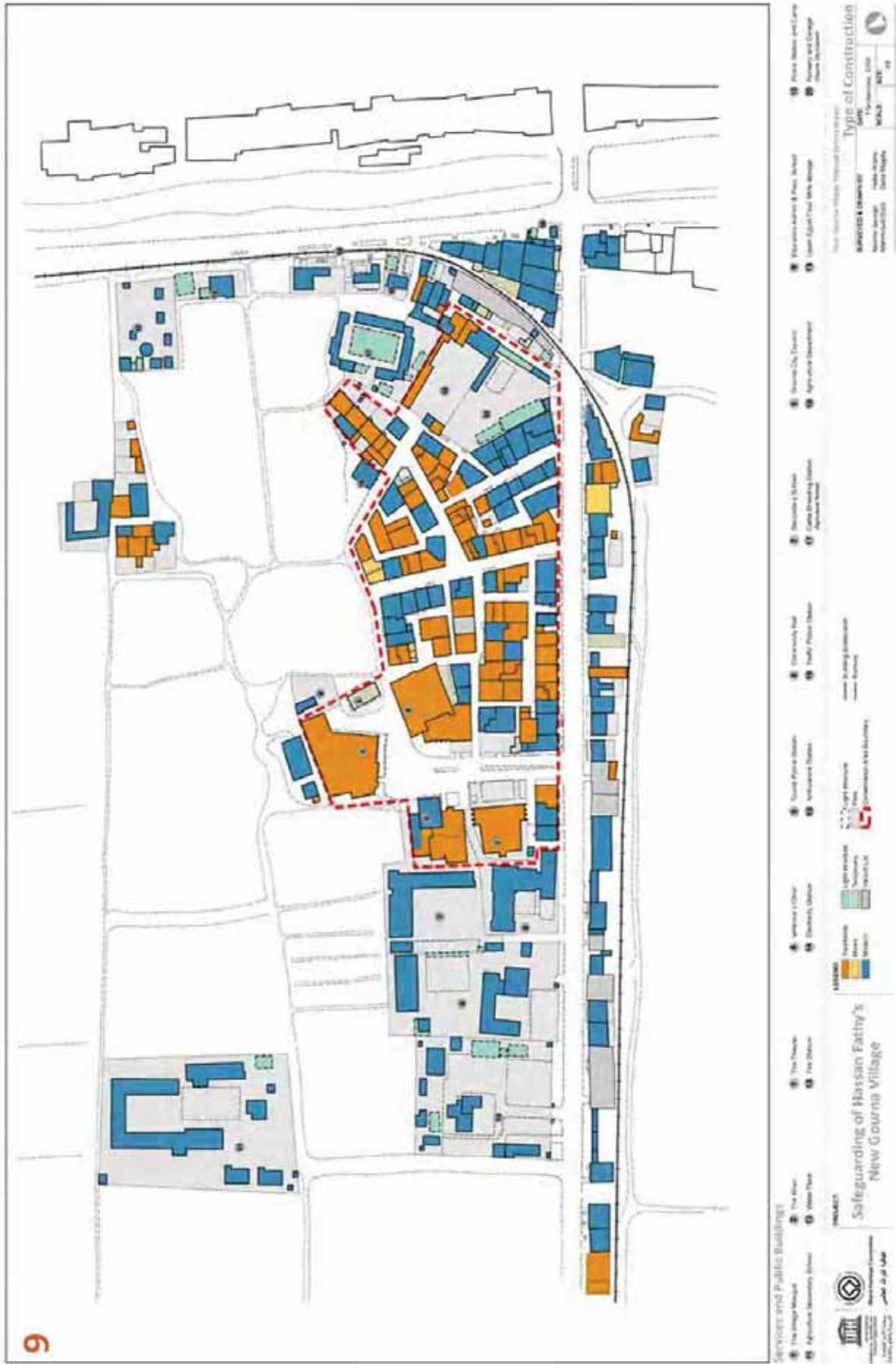
Appendix D Gourna Maps

1. New Gourna Village Survey Map 1
2. New Gourna Village Survey Map 2

Existing Conditions Maps

3. Urban Fabric (Solids and Voids)
4. Building Heights Map
5. Ground Floor Land Use Map
6. Overall Building Conditions Map
7. State of Integrity Map
8. Architectural Significance Map
9. Type of Construction Map
10. Recommended Actions Map
11. Status of Ownership Map
12. Households, Businesses & Others





References

➤ Books

- Abouseif, D. B. "Reconnaissance Report of Damages to Historic Monuments in Egypt, following the 1992 Dashour Earthquake." State University of New York, Buffalo. 1994.
- A Cunningham, "Modern Movement Heritage" Taylor & Francis 1998.
- Aga Khan Trust For Culture, project brief 2005.
- Cliff Moughtin With Peter Shirley, Urban Design: Green Dimensions, Architectural Press, Second edition 2005.
- Cultural Heritage and Development, the International Bank for Reconstruction and Development press 2001.
- Cultural heritage and development in the Arab world / editors, Fekri Hassan, Aloisia de Trafford, Mohsen Youssef ; foreword Ismail Serageldin. – Alexandria,Egypt : Bibliotheca Alexandrina, 2008.
- Cox, D.R., Applied Statistics: A Review, *Annals of Applied Statistics*, 2007.
- Dennis Rodwell, Conservation and Sustainability in Historic Cities Blackwell Publishing 2007.
- Derek Worthing, Stephen Bond, "Managing Built Heritage"Wiley-Blackwell 2008.
- European Environment Agency, *Environmental Signals 2000*, Environmental Assessment Report No. 6, 2000.
- Gamal Hamdan,The Personality of Egypt (Shakhsiya Misr) Third Edition volume I ,II, III .1984
- Giles Atkinson, Simon Dietz, Eric Neumayer, "Handbook of Sustainable Development " Edward Elgar Publishing | 2007 |
- Hildebrand Frey, Designing the City, Towards a more sustainable urban form Taylor & Francis e-Library, 2005.
- Hussein Abaza, Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach, Copyright UNEP 2004.
- John Feather, Managing the documentary heritage: issues for the present and future. In: (Gorman, G.E. and Sydney J. Shep [eds.]), *Preservation management for libraries, archives and museums*. London: Facet. 2006.

- J. Zhao, *Towards Sustainable Cities in China*, SpringerBriefs in Environmental Science .2011
- Kuik O, Verbruggen, H. *In search of indicators of sustainable development*. Dordrecht: Kluwer Academic Publishers.1991.
- Levine, R. "The Charter of European Cities and Towns towards Sustainability", *Proceedings of the Twentieth National Passive Solar Conference, ASES*, 1995.
- Lloyd Jones, David, "Architecture and the Environment: Bioclimatic Building Design". The Overlook Press, New York (1998)
- Maarouf, Nazeih. *Awards of the First International Islamic Artisans-at-Work Festival*. Catalogue of winning entries at the festival held in Islamabad, October 1–14, 1994. Istanbul, Turkey: IRCICA (Research Centre for Islamic History, Art, and Culture). 1999.
- Michael Forsyth, *Understanding Historic Building Conservation* Blackwell | 2007|
- Mourato, Susana. "Effects of Air Pollution on Cultural Heritage: A Survey of Economic Valuation Studies." Report prepared for die UN Economic Commission for Europe. Centre for Social and Economic Research on die Global Environment (CSERGE), University College London. Processed. 1997.
- Munier N. *Handbook on urban sustainability*. Dordrecht: Springer. 2007.
- Norbert Muller, Peter Werner & John G. Kelcey *Urban Biodiversity and Design (Conservation Science and Practice)* Wiley-Blackwell (May 18, 2010)
- Munier N, *multi criteria environmental assessment* Kluwer academic publishers,2004.
- Paola Sassi, *Strategies for Sustainable Architecture* Publisher: Taylor & Francis |edition 2006|
- Robert Riddell, *Sustainable Urban Planning, Tipping the Balance* Blackwell Publishing Ltd 2004.
- Sadler, B. *A Framework Approach to Strategic Environmental Assessment: Aims, Principles and Elements of Good Practice*, , J. (ed.)*Proceedings of International Workshop on Public Participation and Health Aspects in Strategic Environmental Assessment*. Regional Environmental Centre for Central and Eastern Europe, Szentendre, Hungary 2001.

- Sadler, B. From environmental assessment to sustainability appraisal, *Environmental Assessment* Institute of Environmental Management and Assessment, Lincoln and EIA Centre, University of Manchester. *Yearbook 2002*
- Sippe, R.(Criteria and standards for assessing significant impact, in Petts, J. (ed.) *Handbook of Environmental Impact Assessment (Volume 1)*, Blackwell Scientific, Oxford, UK. 1999.
- Steven G. Heeringa, Brady West, *Applied survey data analysis-* Taylor and Francis Group, LLC, 2010.
- Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents, ODPM 2005
- Sustainable Development Strategy Study Group, Chinese Academy of Sciences. *China's Sustainable Development Strategy Report 2003*. Beijing: Science Press. 2003.
- Sustainable Land Development and Restoration: Decision Consequence Analysis Publisher: Butterworth-Heinemann, 2010.
- Thérivel, R. and Minas "Ensuring effective sustainability appraisal", *Impact Assessment and Project Appraisal*. Beech Tree Publishing, Surrey, 2002.
- Williamson, Radford, Bennett, "Understanding Sustainable Architecture", Press-London & New York, 2003.
- Wim Denslagen - *Romantic Modernism: Nostalgia in the World of Conservation* Amsterdam University Press | 2009 |
- World Bank *Environmental Assessment Sourcebook* (3 Vols., various updates), Environment Department, World Bank, Washington DC. (1991 et seq.)
- World Commission on Environment and Development, —Our Common Future, Oxford University Press, New York, 1987.

➤ Internet Sites

- BBC. 2006. "Royals spend night in eco-hotel."
URL: http://news.bbc.co.uk/2/hi/uk_news/4837106.stm.
(Accessed March 2006)

- Office of Sustainability and the Environment. Santa Monica Sustainable City Plan. URL:http://www.smgov.net/Departments/OSE/Categories/Sustainability/Sustainable_City_Plan.aspx
(Accessed February 2010)
- URL: <http://www.marquis-kyle.com.au/bcsignificance.htm>
(Accessed March 2006)
- URL:http://www.nrca.org/publications/coastal/monitoring_rep/reports/MONITORINGREPORT4.htm
(Accessed July 2010)
- Siwa Oasis. Official website.
 - URL: www.siwaOasis_eg.com.
(Accessed
- International Finance Corporation (IFC). World Bank Group. Official website.
 - URL: www.ifc.org/ifcext/mena.nsf/Content/PEPMENA.
(Accessed February 2010)
- Sustainable Seattle,
URL: <http://www.sustainableseattle.org/About>
(Accessed February 2010)
- Environmental Quality International (EQI). Official website.
 - URL:<http://eqi.com.eg/index.php?activemenu=Project%20Showcase&screenid=1>
1.
(Accessed
- ISO 14001

➤ Papers

- Amahan, Ali. Héritage cultural; au Maroc Study commissioned by the World Bank. Rabat, Processed. 1999.
- Crocci, Giorgio. Studies on Seismic Vulnerability of Minarets in Cairo and Criteria for Improving Their Safety. Università degli Studi di Roma., 1997.
- Galal Abada, Grassroot Initiatives versus Governmental Efforts to Preserve Urban Heritage in Egypt, Bibliotheca Alexandrina, 2008.

- Egyptian-Italian Environmental Cooperation Program. “Siwa Environmental Amelioration Project, Second Phase.” Project Document, October 2002.
- Hilden, M. Evaluation of the significance of environmental impacts, in *Report of the EIA Process Strengthening Workshop*, Environment Protection Agency, Canberra. (1997)
- Jones, C. E., et al.. UK environmental statements 1988-1990: an analysis. Occasional Paper No. 29, Department of Planning and Landscape, University of Manchester 1991
- Melikian, Souren. “The Destruction of Art and History in Iran and Afghanistan.” Paper presented at the Symposium on the Anthropology of Cultural Heritages, School of American Research, Santa Fe, N. Mex. 1997.
- Tagemouati, Naima Lahbil. *Patrimoine, tourisme et emploi*. Cas du sud du Maroc. Study commissioned by the World Bank. Rabat Processed. 1999.

➤ Online Documents

❖ World Heritage Convention.

- Operational Guidelines for the Implementation of the World Heritage Convention, The Operational Guidelines are available
- URL: <http://whc.unesco.org/en/guidelines>
(Accessed
- World Heritage Convention,
- URL: <http://whc.unesco.org/en/conventiontext/>.
(Accessed
- Article 11(4), World Heritage Convention.
- Article 13(8), World Heritage Convention.
- The World Heritage Committee’s advisory bodies,
- URL: <http://whc.unesco.org/en/advisorybodies/>.
- (Accessed

❖ UNESCO

- The Centre is the focal point and coordinator within UNESCO for all matters related to the World Heritage Convention. For more information,
- URL: <http://whc.unesco.org/en/134>.

(Accessed

- UNESCO a. *Conserving Cultural and Biological Diversity: The Role of Sacred Natural Sites and Cultural Landscapes*. Paris: UNESCO. 2006
- United Nations. "Economic and Social Commission for Western Asia. Sustainable Development Planning in ESCWA Member States." 2001.
- UNESCO latest revision 2005

❖ Getty Organization

- Historic Cities and Urban Settlements Initiative (Conservation at the Getty)" [cited 2009].
- Available from http://www.getty.edu/conservation/field_projects/historic/
-

❖ ICOMOS

- *ICOMOS, International Cultural Tourism Charter. Principles And Guidelines For Managing Tourism At Places Of Cultural And Heritage Significance*. ICOMOS International Cultural Tourism Committee. 2002.
- Australia ICOMOS
URL: <http://australia.icomos.org/publications/charters/>
(Accessed
- Australia ICOMOS, 1979; revised 1999. The Burra Charter, Guidelines to the Burra Charter for the establishment of cultural significance.
- Burra Charter, Australia ICOMOS, 1999
- China Principles, China ICOMOS, 2002

➤ Periodicals & Reports

- Ashe, J. and Sadler, B. Conclusions and recommendations, in Report of the EIA Process Strengthening Workshop, Environment Protection Agency, Canberra. 1997.
- Chamber of Tourism Products. *The Economic Impact for the Trading and Manufacturing of Tourism Products in the Egyptian Tourism Sector*. Cairo., 2000.
- Shannon C. Mathematical Theory of Communication, the Bell System Technical Journal, 27, 379--423. in 1948
- Wood, C. 1991. EIA of policies, planes and programmes. EIA Newsletter 5, 2-3.

- Commission of the European Communities. Report from the Commission on the implementation of Directive 85/337/EEC of April 1993. COM (93) 28 final. Brussels: CEC. 1993.
- IRCICA (Research Centre for Islamic History, Art, and Culture). 1999. "The First International Seminar on Traditional Carpets and Kilims in the Muslim World: Past, Present, and Future Prospects for Developing This Heritage in the Context of Continuous Changes of the Market Design, Quality, and Applied Techniques, November 1999, Tunis." Istanbul, Turkey.

