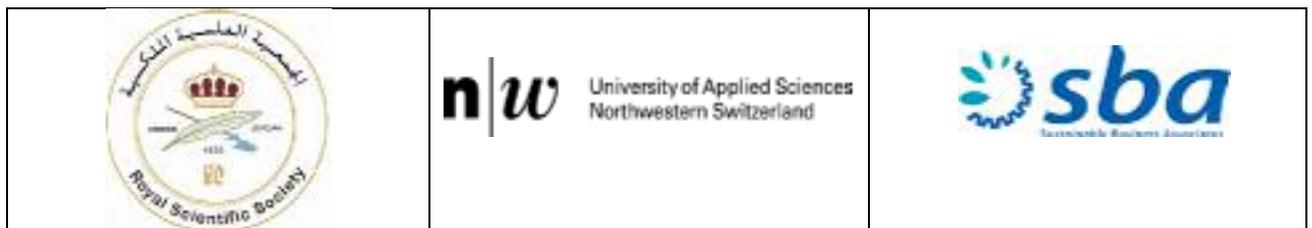# Sustainable Hotel Management in Jordan and Switzerland

September 2007

Study prepared by Joris Müller and partner

Preface

This study was prepared in the context of the Jordanian-Swiss cooperation project on Cleaner Production. The original document served as BSc-thesis at the University of Applied Sciences Northwestern Switzerland (FHNW), School of Economy.

Investigation was done in close cooperation with Bassam Hayek, Mohammed Mosa, Najeeb Al-Atiyat, Nuwar Al Husseini and Jehan Haddad from Royal Scientific Society (RSS), Environmetnal Research Center (ERC), Umaima Al-Majthoub from the Jordanian Hotel Association, Dieter Mutz and Christian Buser from FHNW, Institute of Ecopreneurship (IEC), Manfred Ritschard from FHNW, School of Business as well as Karim Zein from Sustainable Business Associate (SBA).

The names of the hotels and the persons interviewed are kept anonymous in order to assure an unbiased presentation of the results. It is not the intention of the study to benchmarks different hotels in Jordan based on environmental indicators but to provide general recommendations on how to improve environmental performance in the hospitality sector of Jordan.

Management Summary

Problem definition

Jordan is a small country with limited natural resources. With the goal to double the tourism sector by 2010 the demand for natural resources like water and energy will grow.

The goal of this study is the identification of potentials of sustainable hotel management in Jordan. Further, the study compares hotels in Jordan with sample hotels in Switzerland focussing on the management and the consumption of energy and water.

Proceeding

This study is based on internet research, analysis and interviews with relevant persons to the hotel sector in Switzerland and Jordan. The interviews were held either in Switzerland or in Jordan.

Findings and profit

This study shows an overview of the current situation in sustainable hotel management and strategic deductions for the future definitions in managerial, marketing and cost aspects. Furthermore a package of measures with ideas and proposals for the hotels and the government will be compiled.

To achieve the doubling of the tourism economy without negative environmental impacts Jordan should force companies toward sustainability.

The critical success factors for a sustainable hotel management are the management commitment staff training and strengthening awareness of Jordanian people.

The suggestions will help the government and the hotel to achieve a sustainable doubling of the tourism sector.

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Abbreviations

CDM	Clean Development Mechanism
CHF	Swiss Franc
CP	Cleaner Production
CPU	Cleaner Production Unit
DNA	Designated National Authority
DNV	Det Norske Veritas
EFQM	European Foundation for Quality Management
EMAS	EU Eco-Management and Audit Scheme
EMS	Environmental Management System
ERC	Environmental Research Center
EU	European Union
FHNW	University of Applied Sciences Northwestern Switzerland
GDP	Gross Domestic Product
GN	Guest Night
IEC	Institute for Ecopreneurship, FHNW
ISO	International Organisation for Standardisation
JD	Jordanian Dinar
JISM	Jordan Institution for Standards and Metrology
MDG	Millennium Development Goals
MWI	Ministry of Water and Irrigation
NEAP	National Environmental Action Plan
NES	National Environmental Strategy
NGO	Non-governmental Organisation
RSCN	Royal Society for the Conservation of Nature
RSS	Royal Scientific Society
SBA	Sustainable Business Associates
SECO	Swiss State Secretariat for Economic Affairs
SEPR	Service Energy Performance Rate
SGS	Inspection General Society
TÜV	Technical Monitoring Association
UNCCC	United Nation Framework on Climate Change
UNCCD	United Nation Convention to Combat Desertification
UNDP	United Nations Development Program
WTO	World Trade Organisation

1   Introduction

1.1   Initial Position

1.1.1   Jordan

Jordan, officially the Hashemite Kingdom of Jordan, is an Arab country in the Middle East in western Asia. It is bordered by Syria to the north, Iraq to the north-east, Palestine and Israel to the west, and Saudi Arabia to the east and south. It shares with Israel the coastlines of the Dead Sea, and the Gulf of Aqaba with Israel, Saudi Arabia, and Egypt.

Jordan consists mostly of arid desert plateau in the east, with Highland area in the west. The Great Rift Valley of the Jordan River separates Jordan and Israel. The highest point in the country is Jabal Ram (1,734 m), while the lowest is the Dead Sea (-430 m). Jordan is part of a region considered to be "the cradle of civilization".

Fig 1-1:   Map of Jordan

Major cities include the capital Amman in the northwest, Irbid and Az Zarqa, both in the north. The climate in Jordan is dry and hot, since the country is mainly desert. However, the western part of the country receives greater precipitation during the rainy season from November to March. Jordan is a small country with limited natural resources, but has improved much since its inception as a country. Its current GDP per capita soared by 351% in the Seventies. But this growth proved unsustainable and consequently shrank by 30% in the Eighties. But it rebounded with growth of 36% in the Nineties. Just over 10% of its land is arable, and even that is subject to the vagaries of a limited water supply. Rainfall is low and highly variable, and much of Jordan's available ground water is not renewable. Jordan's economic resource base centres on phosphates, potash and their fertilizer derivatives, tourism, overseas remittances, and foreign aid. These are its principal sources of hard currency earnings. Lacking forests, coal reserves, hydroelectric power, or commercially viable oil deposits, Jordan relies on natural gas for 10% of its domestic energy needs. Jordan used to depend on Iraq for oil until the Iraq invasion in 2003 by the United States.

Tourism is a very important sector of the Jordanian economy, contributing between 10 percent and 12 percent to the country's Gross National Product in 2006. In addition to the country's political stability, the geography offered makes Jordan an attractive tourism destination. Jordan's major tourist activities include numerous ancient places, its unique desert castles and unspoiled natural locations to its cultural and religious sites.[1]

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[1] http://en.wikipedia.org/wiki/Jordan

Tab. 1-1: Selected performance indicators for sector development[2]

Sector	Current	2012	2017	Current	2012	2017	Current	2012	2017
	Sector Output (JD Million)			Exports (JD Million)			Cumulative Employment		
Apparel	940	3'200	5'100	920	3'100	5'000	44'000	138'000	175'000
Pharmaceutical	280	560	900	200	430	720	5'500	7'200	11'500
Minerals	400	500	600	340	430	530	6'500	6'200	6'100
Iron and Steal	163	333	493				1'900	1'900	1'900
Furniture	70	220	310	15	110	150	8'400	16'300	17'000
Food and Beverage	560	1'600	2'300	150	810	1'200	26'000	50'000	53'000
Tourism	610	1'700	3'000				44'000	120'000	215'000
Healthcare	390	520	650						
IT Service	120	290	630	32	130	400	5'800	10'000	17'600
	Agriculture Subsidies as a % of GDP			Agriculture GDP as a % of Agriculture Subsidies			Agriculture Output per Unit of Water (USD per m^3)		
Agriculture	2.7%	1.5%	0.5%	81%	250%	350%	n/a	3.6	5.0

1.1.2 Royal Scientific Society

The Royal Scientific Society (RSS) is the largest applied research institution, consultation and technical service provider in Jordan, with more than 600 members of staff. There are seven technical centres and departments housing 38 specialized laboratories:

- Building Research Centre (BRC)
- Electronic Services & Training Centre (ESTC)
- Environmental Research Centre (ERC)
- Information Technology Centre (ITC)
- Mechanical Design & Technology Centre (MDTC)
- Industrial Chemistry Centre (ICC)
- Quality Assurance Department (QAD)

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[2] National Agenda (2006)

RSS renders many services to Jordanian society and the region at large in its specialist fields. It actively supports the Jordanian government by formulating opinions on issues involving research and technology policy, and is an adviser on new issues and controversial problems (such as the chronic water shortage, food and beverages, technical specifications, etc.). It represents Jordan on scientific and technical committees and boards and helps with the development of policies, strategies, and measures.

RSS also provides expert opinion on such issues as building codes. Its research activity also draws attention to health and social problems, for example contamination of mothers' milk by pesticides. RSS is active in building schools in remote areas with convenient specifications. Such projects are usually shunned by the private sector because of low profitability.

Through its membership on dozens of scientific, industrial, and academic boards, RSS exercises a variety of tasks in which its staff function as independent experts. In the scope of technical committee work, for example, standards and specifications are prepared and developed which are essential to the safety and well-being of society.

To carry out studies and applied scientific research related to industry and environment, and to the various areas of development. ERC provides technical services and consultations and promotes the adoption of sound and best environmental practices conforming to sustainable development concept. ERC also undertakes applied research and studies to serve the development process of Jordan with attention given to environmental protection. [3]

1.1.3   Cleaner Production Project

After discussions were held between the Governments of Jordan and Switzerland in 2002, an appraisal mission was commissioned by SECO to work out a concept proposal for the application of CP in Jordan. A report was prepared in May 2003 and based on it a project proposal was elaborated. In November 2003 a Swiss consortium consisting of the University of Applied Sciences of Basel (FHNW), Sustainable Business Associates (SBA) and Carbotech was selected by SECO to act as Reference Centre for the project implementation. The Environmental Research Center of the Royal Scientific Society is the appointed project partner in accordance with the Memorandum of Understanding signed between Jordan and Switzerland in June 2001. ERC/RSS has a very good reputation for delivering cost-effective and high quality services in the environmental and energy field to industries. ERC/RSS has as core competences water and air pollution measurements and monitoring (ambient and plant measurements). The proposed CP project within ERC/RSS has a big potential of sustainability as the RSS has a market oriented approach.

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[3] http://www.rss.gov.jo/aboutus.html

The overall objective of the CP project is to contribute towards a sustainable industrial production mode in Jordan increasing the long-term competitive position of enterprises while reducing their environmental pollution by applying cost-effective measures and technologies. Jordan shall thus be also in a better position to benefit in a sustainable manner from a globalised economy.

The project objective is to enhance the capacity of the ERC/RSS in providing high quality services on a sustainable base to enterprises in the field of CP techniques and methodologies as well as Cleaner Technologies. [4]

1.1.4   Cleaner Production Unit

The Cleaner Production services offered by the Cleaner Production Unit (CPU) of the ERC materialize a successful cooperation with a Swiss Reference Center.

The Institute for Ecopreneurship (IEC) has proven knowledge in the development, organization and execution of graduate and post-graduate courses in the field of environmental technology and management. Its education and research activities are focused on industrial ecology, water resources management, CP and waste minimization. It is engaged in several national as well as in international projects and programmes for industrial waste prevention and CP. It has also organised numerous international training events in Switzerland and abroad.

CP is a new part of the project in the hotel and tourism sector. [5]

1.2   Goals of the study

The goal is the identification of potentials of sustainable hotel management in Jordan.

Further the study compares hotels in Jordan with example hotels in Switzerland focussing on the consumption of energy and water and the waste management.

This study sets out to show an overview of the current situation in sustainable hotel management and strategic deductions for the future definitions in managerial, marketing and cost aspects. Furthermore, a package of measures with ideas and proposals for the hotels and the Government will be compiled.

1.3   Out of Scope

Because of the complexity the social aspect will be out of scope.

This study is confined to the hotel sector, consequently the rest of the tourism sector will not be analysed.

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[4] http://www.cp.org.jo/project.htm

[5] http://www.cp.org.jo/aboutus.htm

1.4   Methods and Procedure

This study is based on internet research and interviews with persons relevant to the hotel sector in Switzerland and Jordan. The interviews were held either in Switzerland or in Jordan.

The data in chapters 3.4, 4.1 and 4.3 come from a survey which is part of the Green-Tas project managed by the Hashemite University. The project aims to develop strategies and instruments to pro-actively address the problems caused by increasing tourism in order to ensure a sustainable development of the sector in Jordan.[6]

1.5   Overview and Hints for Reading

For a better reading the exchange rate CHF to JD is always 0.5.

For a better understanding of the text only the male form will be used.

If there is no source the information has been researched by our own and based on interview findings.

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[6] Green-Tas Project (2006)

2   Political Framework

This part shows an overview over the environmental political framework in Jordan. It shows in chronological order the most important international agreements and the national laws and strategies of Jordan for the tourism sector.

Tab. 2-1:   Chronology of environmental planning in Jordan from 1991-2006

Year	Policy
1991	UN Framework on Climate Change (UNCCC)
1992	National Environmental Strategy (NES)
1994	National Environmental Action Plan (NEAP)
1996	UN Convention to Combat Desertification (UNCCD)
1998	Water Strategy
2000	National Agenda 21
2003	New Environmental Law
2003	Kyoto protocol
2004	Stockholm Protocol on Persistent Organic Pollutants
2004	National Strategy of Tourism
2005	National Energy Strategy
2006	The National Agenda

2.1   National Environmental Strategy (1992)

The national environmental strategy (NES) prepared in 1992 was an important first step for Jordan in confronting environmental problems. Formulated by some 180 Jordanian specialists, the NES catalogues all environmental pressures and problems and contains over 400 specific recommendations and suggested actions in the field of environmental protection and conservation. In a document of 10 thematic chapters, five strategic directions for action were recommended under the NES:

- Construction of a legal framework for environmental management including the enactment of a comprehensive environmental law and complementary environmental legislation and the creation of a national environmental impact assessment process.

- Strengthening institutions working for environmental protection and conservation including funding staffing training equipment educational outreach and legal authority. This should include the environmental agency key ministries and NGOs.
- Focusing on cross-sectoral priorities such as water resources management and population expansion, which will have serious long term impacts if not addressed urgently.
- Managing protected areas, including the creation of new natural reserves (Wadi Rum, Dana, Burqa) and a marine national park in Aqaba, to complement the existing reserves and the rehabilitation of the core area of the Azraq oasis.
- Fostering public additional environmental and conservation education environmental health awareness mechanisms for public participation in natural resources environmental decision making and creation of a system of urban nature parks and green spaces.

However the NES was not able to set priorities among over 400 suggested actions. Moreover financial costs have not been calculated, institution capacity issues have not been addressed and the linkages with other national policies and strategies need to be clarified. The lack of prioritization has led the Government to spread its limited resources over a wide range of environmental initiative without a clear perspective on their cost effectiveness.

The NES included specific chapters on agriculture and land management, water resources, wildlife habitats, coastal areas and marine environment and energy. The thematic categorization by the NES was very helpful in developing a scientific policy framework for future policies and action plans in Jordan.[7]

2.2   National Environmental Action Plan (1994)

This document provided a comprehensive assessment of environmental problems and opportunities in Jordan, combined with a prioritized and phased plan of action for addressing these issues. The NEAP identified 41 priority environmental needs, which included four cross-sectoral environmental management capacity building needs and 37 sectoral environmental actions. Immediate attention was recommended for 19 priorities. Relevant for the tourism sector are the following:

- Pricing of water
- Enforcement of regulations in the water sector
- Restructuring of the water sector

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[7] Jordan Environmental Policy 2006

- Development of regulations to control urban/industrial pollution
- Improved management of national cultural and natural heritage
- Development of a national plan for heritage utilization[8]

2.3 Water Strategy (1998)

Due to the increase in water demand and the scarcity of supply, the Ministry of Water and Irrigation (MWI) adopted a Water Strategy in 1998 and supplemented it with different water policies in four water sectors aiming to make a balance between water demand and supply and emphasizing to give major role for private sector. The four policies are related to: groundwater management, irrigation water, water utilities and wastewater management. The Government of Jordan also embarked upon a privatisation program. The goal was to increase the efficiency of management and attracting private investment into the economy.

The most important issues emphasized by the Water Strategy can be summarized as follows:
- Establishing a comprehensive national water data bank to support a program of monitoring and a system of data collection, entry, updating, processing and dissemination of information.
- Prioritization of water resources allocation to meet the basic human needs followed by tourism and industrial purposes.
- Collection and treatment of wastewater shall be carried out according to standards that allow its reuse in unrestricted agriculture and other non-domestic purposes, including groundwater recharge.
- Appropriate wastewater treatment technologies shall be adopted with due consideration to economy in energy consumption, and quality assurance of the effluent for use in unrestricted agriculture.
- Marginal quality water and brackish water sources shall be enlisted to support irrigated agriculture.
- Special care will be given to the protection of water resources against pollution, quality degradation and depletion.
- Mining of renewable groundwater aquifers checked, controlled and reduced to sustainable extraction rates[9]

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[8] Jordan Environmental Policy 2006

[9] Jordan Environmental Policy 2006

2.4 National Agenda 21 (2000)

Jordan has prepared its National Agenda 21 document under the supervision of the General Corporation for Environment Protection and UNDP assistance. The document outlines several key areas related directly to natural resources, dry land issues and energy and it promotes the participatory approach at all levels to ensure success and sustainability. The Agenda also reflects the integrated approach to environment and development and converges with objectives of poverty alleviation and sustainable human development. Thus, Agenda 21 outlines a multi-disciplinary national plan of action for an environmentally sound and sustainable economic development. The Agenda 21 demonstrates an umbrella document that identifies combating desertification as a national priority and promotes its integration into the national policy and calls for the involvement of all stakeholders in the implementation of proposed programmes and actions. The agenda proposed a number of projects based on a set of priorities that were identified following a thorough review of public needs in general, and the environmental sector in particular. The Agenda 21 process also depended largely on information, and produced two strategies for environmental information and awareness as annexes to the main Agenda 21. The Agenda 21 introduced the concept of "integrated resource management" by linking the sectors of water resource management, land resource management, agricultural resources, energy resources and mineral resources in one chapter. The outline of the Agenda 21 failed to integrate biodiversity issues within the "integrated resource management" section and placed biodiversity under the section on "natural and cultural heritage" providing little conceptual linkages with natural resource management.

Regarding specific themes of the Rio Conventions, the National Agenda 21

- Combating Desertification
- Biodiversity
- Climate Change
- Agriculture Projects
- Energy Projects[10]

2.5 New Environmental Law (2003)

The main law governing environmental management in Jordan is the Environmental protection Law No. 1 for 2003 which has indeed established the Ministry of Environment in Jordan. The law considers the Ministry of Environment to be the competent authority for the protection of environment in the Kingdom, and the official and national authorities shall be bound to

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[10] Jordan Environmental Policy 2006

implement the instructions and resolutions issued under the provisions of this law which gives the Ministry all the juridical powers it requires implementing the law.

The ministry shall be considered as the competent authority for the protection of the environment in the Kingdom, and the official and national authorities shall be bound to implement the instructions and resolutions issued under the provisions of this law and the regulations issued in accordance therewith, under the penalty of legal responsibility provided for therein and in any other legislation.

The ministry shall be considered as the competent authority at the national, regional and international level, in respect of all the environmental issues and the donors in cooperation and coordination with the competent authorities.

- Regulation of Nature Protection.
- Regulation of environment protection from population in emergency case
- Regulation of water protection.
- Regulation of air protection.
- Regulation of sea environment & shores protection.
- Regulation of natural reserves and national parts.
- Regulation of Management of harmful & hazardous substances, transport and handling
- Regulation of Management of solid wastes.
- Regulation of Environment impact assessment.
- Regulation of soil protection[11]

2.6 Jordan and Kyoto Protocol (2003)

Jordan ratified the Kyoto protocol in 2003 to become only the third Arab country party to the protocol. A national committee was formed to develop project proposals and initiatives for the Clean Development Mechanism (CDM) of the Kyoto protocol. The Protocol came into force February 2005 and Jordan will work on mobilizing resources under the CDM to implement the Convention. Jordan has developed its Designated National Authority (DNA) to oversee all activities and planning for resource mobilization under the CDM. The Jordan DNA consists of many stakeholders from various sectors in the country. [12]

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[11] Climate Change Report 2005

[12] Climate Change Report 2005

2.7 National Tourism Strategy (2004)

The Ministry of Tourism has developed the National Tourism Strategy 2004-2010 with a private-sector led perspective on placing tourism as a major income-generating and revenue based sector. The tourism strategy states a mission that "Jordan will develop a sustainable tourism economy through a partnership of government, the private sector and civil society to expand employment, entrepreneurial opportunity, social benefits, industry profits and state revenue". This strategy is based on private sector investments in promoting national tourism, and includes ecotourism sites as "assets" for national tourism. The strategy does not take into consideration some basic "sustainable tourism" including carrying capacity, conservation and sustainable use of natural resources, and developing guidelines for management of natural heritage sites and ecotourism locations. The strategy states that tourism development in Jordan will be sustainable and characterized by:

- Preserving the environment and adopting ecologically sound policies.
- Respecting the lifestyles and cultures of its people and communities.
- Balancing the principles of profits with the need for socially responsible business practices.
- Adhering to the global code of ethics for tourism as advocated by the World Tourism Organization (WTO).
- Targeting the citizens and communities of Jordan as the primary beneficiaries of tourism.

The strategy is designed to bring about the following results by 2010:

- Increase tourism receipts form JD 570 million in 2003 to JD 1.3 billion
- Increase tourism-supported jobs from 40'791 in 2003 to 91'719,
- Achieve taxation yield to the government of more than JD 455 million

The strategy targets the following priority niche markets[13]:

- Cultural Heritage (Archaeology)
- Religious
- Eco-tourism
- Health and wellness
- Adventure
- Meeting, incentives, conferences and events
- Cruising[14]

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[13] Jordan National Tourism Strategy 2004-2010

[14] Jordan Environmental Policy 2006

2.8 National Energy Strategy (2005)

The strategy included environmental components by focusing on the development of renewable and sustainable energy sources which provides linkages between environmental protection and transition to sustainable energy. The strategy did not include issues of climate change and the opportunities for both environmental protection and sustainable energy through the Kyoto protocol, but the strategy is considered to be a suitable planning road map for sustainable energy production and consumption. The strategy states a target of 2% contribution of renewable energy in the total energy mix in Jordan and increasing the share of renewable energy for electricity to 8%. Jordan has also developed an energy efficiency strategy in 2004. [15]

2.9 National Agenda (2006)

The National Agenda was prepared in 2005 and launched in 2006 comprising a comprehensive political and socio-economic reform plan for the country until 2017. The National Agenda was based on extensive research and integrated inputs from key players and organizations from within and outside the government. The main goal of the National Agenda is to achieve consistent policies and ensure that they will not be subject to government change while taking into consideration the need to regularly develop and update these policies. The National Agenda contained a special section on environmental sustainability. This section focused on six issues including desertification and sustainable land management. The following issues are relevant for the tourism:

- Promote the application of clean-technologies and the adoption of environmental management systems, for example ISO 14001, as vehicles for better environmental management
- Encourage and expand utilization of renewable energy resources such as solar, wind, and gas generation from solid waste sites.
- Integrate policies relating to the protection of the Red Sea and its environment in relevant development policies including the implementation of appropriate monitoring programmes for water and coral reefs.
- Enhance control of beach recreational activities and patrolling and control the wastewater treatment system, dumping of litter, garbage and tires into the sea
- Conduct clean-up campaigns of the shoreline
- Encourage involvement of diverse sectors, promoting compatibility and balancing uses
- Enhance and increase public awareness on environmental issues
- Engage the public openly and transparently.[16]

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[15] Jordan Environmental Policy 2006

[16] National Agenda (2006)

2.10 Conclusion

The environmental political framework in Jordan consists of:

- Signed international agreements
- National strategies
- The environmental law

The Ministry of Environment and also the environmental law were established in 2003. The law is relatively new and the government has little experience in this area and the enforcement is not very strict. Jordan has created a division of Law Enforcement Environmental Police to protect the natural resources and ensure compliance with the environmental law. In theory, the idea of an environmental police force in Jordan may seem both logical and necessary. However, practice is another thing and their success is little[17]

The environmental awareness in the population is on a low level. It is a long process to change their awareness about environmental protection. Also the general behavior to be aware of what are the limits of the constant demand of natural resources does not exist.

Jordan's National Tourism Strategy outlines the steps for doubling the Kingdom's tourism economy by 2010. To achieve the doubling of the tourism economy without negative environmental impacts Jordan should force companies toward sustainability.[18] Experiences in Switzerland have shown that the only successful way is to have strict laws and regulations and a qualified monitoring system.

Water

In the Water Strategy there is a Wastewater Management Policy which includes treatments of wastewater. Treatment through the public network is the best option however only applicable where the infrastructure exists, which is rarely the case in sparsely populated resort areas. In Petra there used to be a project to treat the waste water from the hotels. But because of the high energy consumption and cost this project was stopped.

Energy

The National Energy Strategy includes environmental components by focusing on the development of renewable and sustainable energy sources but in almost no case the hotels use renewable and sustainable energy. Either because the space is not available or because of missing information related to the technical know-how.

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[17] Jordan Business (2007)

[18] Green-Tas; Description and Analysis of Selected Success Stories (2006)

Solid Waste

The per capita amount of solid waste generated daily in Jordan is approximately 1 Kg/capita/day.[19] This is expected to increase on account of development activities, population growth, and changing patterns of Jordanian consumption behavior.

A national policy or strategy for solid waste management does not exist. There are no standards or specifications for solid waste management in Jordan. As a result, solid waste management systems have not been developed to adequate levels and collected waste is generally "managed" in dumps.

However, a new by-law specifically to address solid waste management is now under discussion and, if approved, will be promulgated under the environmental law.

Not all solid and packaging waste produced can go for recycling. The municipalities do not provide any collection, sorting or recycling facilities. Yet, only aluminum, other metals, batteries, kitchen oils and some types of paper are taken for recycling by companies. There is a problem concerning paper recycling as well as glass recycling. [20]

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[19] CDM in Jordan (2006)

[20] Green-Tas; Determination of the environmental

3 Management Aspects

3.1 Environmental Management System

The Environmental Management System (EMS) is part of a management system of an organization (enterprise etc.), in which specific competencies, behaviors, procedures and demands for the implementation of an operational environmental policy of the organization are defined.[21]

EMS can assist an organisation to meet its increasingly heavy load of responsibility for the future condition of our world environment. In many cases, the introduction of an environmental management system can also aid cost savings, and reduction of environmental liability.

There are a number of standards available around which a company can model its Environmental Management System. On the international scene there is ISO 14001. This standard is part of the ISO 14000 series of standards providing not only a specification but guidance and advice on a wide range of environmental issues including auditing, labeling, life-cycle assessment etc.[22]

In the EU, in addition to the ISO 14001 there one the EU Eco-Management and Audit Scheme (EMAS) and the eco-label award.

Key elements of an EMS

The following points are the key element of any EMS:
- Policy Statement - a statement of the organization's commitment to the environment
- Identification of Significant Environmental Impacts - environmental attributes of products, activities and services and their effects on the environment
- Development of Objectives and Targets - environmental goals for the organization
- Implementation - plans to meet objectives and targets
- Training - ensure that employees are aware and capable of their environmental responsibilities
- Management Review

A set of international standards brings a world-wide focus to the environment, encouraging a cleaner, safer, healthier world for us all. The existence of the standards allows organizations to focus environmental efforts against an internationally accepted criterion.[23]

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[21] http://en.wikipedia.org/wiki/Environmental_management_system

[22] http://www.praxiom.com

[23] http://www.praxiom.com

3.2 European Foundation for Quality Management (EFQM)

The EFQM Excellence Model is a framework for organisational management systems, promoted by the European Foundation for Quality Management (EFQM) and designed for helping organisations in their drive towards being more competitive. Regardless of sector, size, structure or maturity, to be successful, organisations need to establish an appropriate management system. The EFQM Excellence Model is a practical tool to help organisations do this by measuring where they are on the path to excellence; helping them understand the gaps; and then stimulating solutions. Over the years a number of research studies have investigated the correlation between the adoption of holistic Models, such as the EFQM Excellence Model, and improved organisational results.

The model can be used in four ways:

- As a framework which organisations can use to help them develop their vision and goals for the future in a tangible, measurable way
- As a framework which organisations can use to help them identify and understand the systemic nature of their business, the key linkages and cause and effect relationships
- As the basis for the EFQM Excellence Award, a process which allows Europe to recognise its most successful organisations and promote them as role models of excellence for others to learn from
- As a diagnostic tool for assessing the current health of the organisation. Through this process an organisation is better able to balance its priorities, allocate resources and generate realistic business plans.

The EFQM Excellence Model is a non-prescriptive framework based on nine criteria. Five of these are 'enablers' and four are 'results'. The 'enabler' criteria cover what an organisation does. The 'results' criteria cover what an organisation achieves. 'Results' are caused by 'enablers' and feedback from 'results' help to improve 'enablers'. The model, which recognises there are many approaches to achieving sustainable excellence in all aspects of performance, is based on the premise that excellent results with respect to performance, customers, people and society are achieved through leadership driving policy and strategy, that is delivered through people partnerships and resources, and processes.[24]

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[24] EFQM in Wikipedia
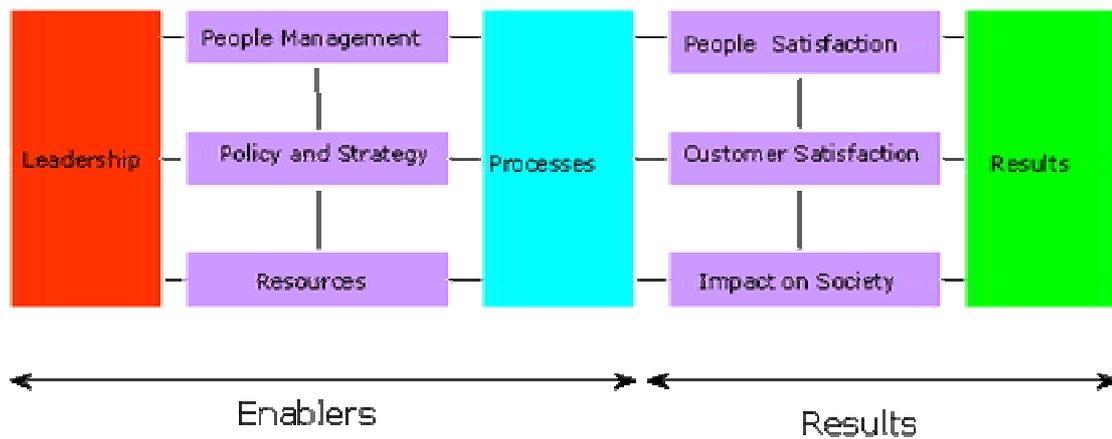
Fig 3-1:   EFQM scheme

3.2.1 ISO 14001

ISO is the International Organization for Standardization. It was set up in 1947 and is located in Geneva, Switzerland. Its purpose is to facilitate and support international trade by developing standards that people everywhere would recognise and respect. ISO achieves this purpose through the participation and support of its member bodies. These member bodies represent standards organizations from 146 countries.

ISO 14001 was published in 1996 and revised in 2004 to improve compatibility with ISO 9001 (quality management) and to clarify the existing text without adding any new requirements. It is part of the ISO 14000 series of standards which include standards in the fields of environmental auditing, environmental performance evaluation, environmental labelling and life cycle assessment. The particular standard is applicable to all types and sizes of organisations worldwide. It aims at developing a systematic management of the activities of an organisation in relation to the environment, aiming at the continual improvement of its environmental performance.

The ISO 14001 provides an organisation with a structured process and a framework with which to achieve and systematically control the level of environmental performance it sets for itself. In order to achieve its objectives the EMS encourages organisations to consider implementation of best available technology where appropriate and where economically viable. However, it does not itself state specific environmental criteria as the main aim is the continual improvement and not achieving a certain level of environmental performance. Yet, in the long run organisations with an effective EMS are expected to improve their performance. Apart from the main environmental

aspects, occupational health and safety issues may as well be incorporated in the system although the standard does not address such requirements.[25]

The ISO 14001 EMS methodology consists of five steps:

- Environmental policy setting
- Planning the EMS
- Implementation and operation of the EMS
- Checking and corrective action
- Establishment of an EMS review procedure.
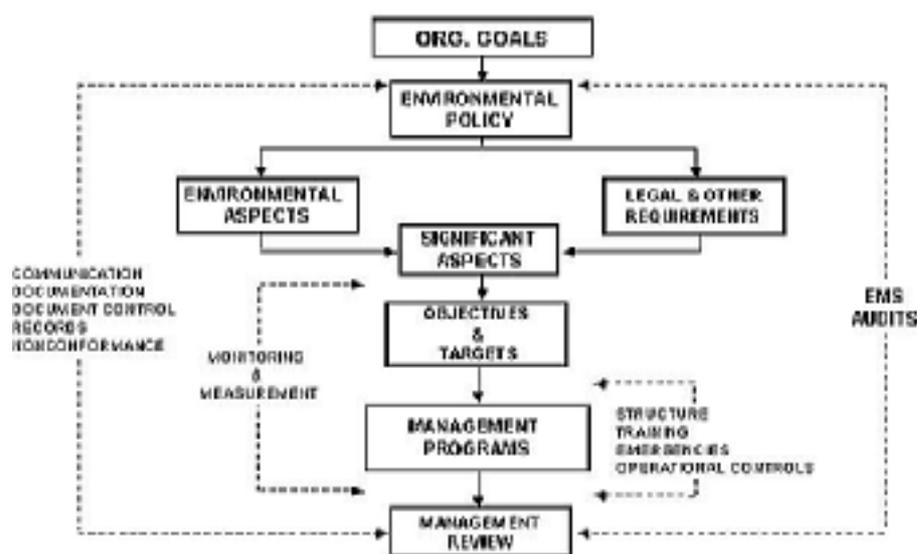
Fig 3-2:   The ISO 140001 framework[26]

The following points are the key requirements of the ISO 14001:

- Environmental Policy
  - o develop a statement of the organization's commitment to the environment
- Environmental Aspects and Impacts
  - o identify environmental attributes of products, activities and services and their effects on the environment
- Legal and Other Requirements
  - o identify and ensure access to relevant laws and regulations
- Objectives and Targets and Environmental Management Program

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[25] Green-Tas; Evaluation of Alternative Environmental Systems (2006)

[26] Green-Tas; Evaluation of Alternative Environmental Systems (2006)

- o set environmental goals for the organization and plan actions to achieve objectives and targets
- Structure and Responsibility
    - o establish roles and responsibilities within the organization
- Training, Awareness and Competence
    - o ensure that employees are aware and capable of their environmental responsibilities
- Communication
    - o develop processes for internal and external communication on environmental management issues
- Operational Control
    - o identify, plan and manage the organization's operations and activities in line with the policy, objectives and targets, and significant aspects
- Emergency Preparedness and Response
    - o develop procedures for preventing and responding to potential emergencies
- Monitoring and Measuring
    - o monitor key activities and track performance including periodic compliance evaluation
- Evaluation of Compliance
    - o develop procedure to periodically evaluate compliance with legal and other requirements
- Non-conformance and Corrective and Preventive Action
    - o identify and correct problems and prevent recurrences
- EMS Audit
    - o periodically verify that the EMS is effective and achieving objectives and targets

3.2.2 EU Eco-Management and Audit Scheme (EMAS)

The EMAS is a management tool for companies and other organisations to evaluate, report and improve their environmental performance. The scheme is voluntary and is applicable to public or private organizations operating in the European Union member states. The scheme has been available for participation by companies since 1995 and was originally restricted to companies in industrial sectors.

An EMAS logo has been adopted to signal an organization's EMAS registration. The logo shall always bear the registration number of the organisation.

The EMAS follows the same procedure as the ISO 14001. In particular, ISO 14001 has been integrated in the EMAS scheme as the EMS required. According to Article 1 of the Regulation the objective of EMAS is to promote improvements in the environmental performance of organisations by various means, one of which is the introduction and implementation by the organisations of environmental management systems based on the ISO 14001 requirements. The adoption of ISO 14001 as the management system element of EMAS, allows the European organisations to progress from ISO 14001 to EMAS without undue duplication of effort.

Fig 3-3:   The EMAS logo

However there are some basic differences between the ISO 14001 and EMAS requirements. In particular, a number of additional steps and some modifications are required for an ISO 14001 certified organisation to meet the EMAS requirements as described in the EMAS regulations. Apart from the five main stages of ISO 14001 there are two additional elements that are required for acquiring EMAS. The first one is the preparation of an Environmental Statement that allows the EMS to become publicly available whilst the second is the external validation and registration of this statement before this is further disseminated.

Fig 3-4:   Procedure followed for acquiring EMAS

The key points of EMAS are:
- third party verification
- compliance with legal requirements
- managing environmental impacts

- improving environmental performance
- provision of information to the public[27]

The most important difference between EMAS and ISO 14001 is that EMAS focuses more directly on the improvement of the organisation's environmental performance whilst ISO 14001 places more emphasis on establishing and improving the EMS as a whole.[28]

Tab. 3-1: Differences between EMAS and ISO 14001[29]

	EMAS	ISO 14001
Preliminary environmental review	Verified initial review	No review
External communication and verification	Environmental policy, objectives, environmental management system and details of organisation's performance	Environmental policy made public
Audits	Frequent and methodological audits of the environmental management system and of environmental performance	Audits of the environmental management system (frequency or methodology not specified)
Contractors and suppliers	Required influence over contractors and suppliers	Relevant procedures are communicated to contractors and suppliers
Commitments and requirements	Employee involvement, continuous improvement of environmental performance and compliance with environmental legislation	Commitment of continual improvement of the environmental management system rather than a demonstration of continual improvement of environmental performance

3.2.3 EU Eco-label

While ISO 14001 and EMAS are Environmental Management Systems focusing on the general environmental performance of a company, the EU eco-label scheme focuses on the specific products or services produced or offered by the organisation. The eco-label scheme is designed to encourage businesses to market products and services that are less harmful to the environment. The identification of the scheme is through a common label, the "EU Flower"

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[27] http://www.lrqa.co.uk

[28] Green-Tas; Evaluation of Alternative Environmental Systems (2006)

[29] Fact sheet EMAS and ISO 14001 (2001)

Fig 3-5:   The EU flower, logo of eco-label scheme

The European eco-label for tourist accommodation serves as an added quality value when customers are choosing a resort as the certified enterprises are officially distinguished as environmentally friendly. All tourist accommodations being a "sheltered overnight accommodation in appropriately equipped rooms, including at least a bed, offered as a main service to tourists, travellers and lodgers" can apply for scheme award. Overnight shelter accommodations "may also include the provision of food services, fitness activities and/or green areas"

The European Commission establish the ecological criteria for the award in April 2003.

The criteria aim to limit the main environmental impacts from the three phases of the service's life cycle (purchasing, provision of the service, waste).

In particular they aim to:
- limit energy consumption
- limit water consumption
- limit waste production
- favour the use of renewable resources and of substances which are less hazardous to the environment
- promote environmental communication and education

In the tourist accommodation sector category 84 mandatory and optional criteria have been defined. The criteria address issues related to energy, water, dangerous chemicals, detergents and disinfectants, waste, general management as well as other issues such as the designation of no smoking areas, the provision for public transportation and the provision for environmental communication and education.[30]

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[30] Green-Tas; Evaluation of Alternative Environmental Systems (2006)
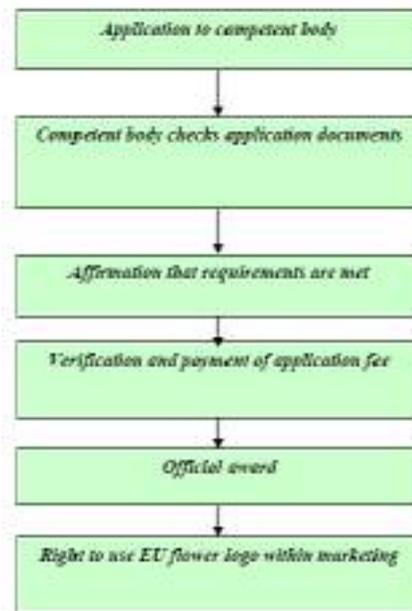
Fig 3-6: Eco-label award procedure[31]

The following points are the key mandatory requirements of the EU eco-label:

- Electricity from renewable sources
  - At least 22 % of the electricity shall come from renewable energy sources
- Air conditioning
  - Any air conditioning system bought within the duration of the eco-label award shall have at least Class B energy efficiency
- Switching off heating or air conditioning
  - If the heating and/or the air conditioning is not automatically switched off when windows are open, there shall be easily available information reminding the guest to close the window(s) if the heating or air conditioning is on.
- Energy efficient light bulbs
  - Within one year from the date of application, at least 60 % of all light bulbs in the accommodation shall have an energy efficiency of Class A
  - Within one year from the date of application, at least 80 % of light bulbs that are situated where they are likely to be turned on for more than five hours a day shall have an energy efficiency of Class A
- Water flow from taps and showers
  - The water flow of the taps and showers shall not exceed 12 litres/minute.
- Changing towels and sheets
  - The guest shall be informed of the environmental policy of the tourist accommodation whereby sheets and towels shall be changed either at his or her request, or by default once a week for lower class accommodation, and twice a week for higher class accommodation.
- Waste water treatment

- All waste water shall be treated.
  - Waste separation
    - The staff shall separate waste into the categories that can be handled separately by the local or national waste management facilities. If the local administration does not offer separate waste collection and/or disposal, the accommodation shall write to them expressing their willingness to separate waste, and expressing their concern about the lack of separate collection and/or disposal.
  - Disposable products
    - Unless required by law, none of the following disposable products shall be used in rooms and restaurants:
      - "one-portion" or "one-use" toiletries (such as shampoo, soap, shower caps, etc.),
  - Policy setting and action program
    - The management shall have an environmental policy and shall draw up a simple environmental policy statement and a precise action program to ensure the application of the environmental policy.
  - Staff training
    - The tourist accommodation shall provide information and training to the staff, including written procedures or manuals, to ensure the application of environmental measures and to raise awareness on environmentally friendly behaviour. Adequate training shall be provided to all new staff within four weeks of starting employment and for all staff at least once a year.
  - Energy and water consumption data
    - The tourist accommodation shall have procedures to collect and monitor data on overall energy consumption (kWh), electricity consumption (kWh), energy used for heating (kWh), and water consumption (litres).
      Data shall be collected with every bill received, or at least every three months, and shall also be expressed as consumption per overnight stay and per m^2 of indoor area. The accommodation shall report the results yearly to the Competent Body that assessed the application.[32]

3.2.4 Correlation of Eco-label with ISO 14001 and EMAS

As previously mentioned the eco-label scheme focuses on specific products or services, while ISO 14001 and EMAS focus on the environmental performance of the organisation, however, it is expected that the environmental performance of the organisation will improve their products and services environmentally. The eco-label scheme is more specific compared to ISO 14001 and EMAS as the actual actions to be taken are, predefined from the set of the eco-label criteria. However, the management of the tourist accommodation is also invited to take additional actions to the ones covered by the criteria

Nevertheless, the implementation of recognised environmental management schemes such as ISO 14001 and EMAS is taken into consideration by eco-label competent bodies when assessing applications. For example, eco-label applicants who are already certified under EMAS or ISO 14001 can be granted reductions on the annual fee required for the eco-label.

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[32] European Commission 2003/287/EC

Furthermore, certified applicants under EMAS or ISO 14001 automatically fulfill the mandatory general management criteria for the tourist accommodation sector that are required for the eco-label scheme. These criteria provide for:

- maintenance and service of the equipment in compliance with the law and by qualified personnel
- maintenance and servicing of boilers at least yearly and testing of their efficiency
- the establishment of an environmental policy, a simple environmental policy statement and a precise action programme identifying environmental performance targets that should be set every two years
- adequate training to the staff
- active dissemination of information to guests and visitors on the accommodation's
- environmental policy and the actions taken
- frequent monitoring of energy, water and chemicals' consumption and of the volume of the waste produced and annual report of the data to the competent

Furthermore, when assessing the optional criteria, extra points are given if the applicant is certified under EMAS or ISO 14001. Moreover extra points are given if at least one of the main suppliers or service providers of the accommodation is registered under EMAS or ISO 14001

In the other hand, the eco-label scheme may also influence some companies' decision to implement an EMS because it forces them to evaluate their products' overall environmental impacts. Thus it can form a part of the aspects and impacts assessment that the implementation of an EMS requires.[33]

3.3   Example Hotels from Switzerland

Introduction

In Switzerland two hotels (further on called Suisse A and Suisse B) were selected as reference hotels. The first one (Suisse A) is a four star hotel, established in 1975 and is situated directly on the eastern edge of Lake Hallwil, near the village of Meisterschwanden. The hotel has 60 rooms and 3 suites in two buildings the classic part and the modern part.

Its facilities include a lake terrace with pergola, terrace, bar, and restaurants with Gault-Millau seal of excellence and provide seminar facilities. The hotel has been certified to ISO 14001 since 2000 and was awarded to the EFQM in 2003.

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[33] Green-Tas; Evaluation of Alternative Environmental Systems (2006)

The second one (Suisse B) is a five star Resort and Spa hotel which was established in 1983 and is located in the Alps around 1800 meters above sea-level right at the heart of Saas-Fee. It has 83 rooms, 4 junior suites, 1 wedding suite, 1 eagle's nest suite and 5 apartments. Its facilities include 4 restaurants, Piano bar, wellness and well fit area with a rock whirlpool, sauna, steam bath, kneipp bath, solarium, beauty section, event hall, indoor sport gym, fitness room and indoor golf simulator. The hotel has been certified to ISO 14001 since 2005 and to the EU eco-label. The hotel has been also certified to ISO 9001 since 2000.

Action for the environment

In order to improve their environmental performance both hotels have set a number of targets since the ISO 14001 implementation. These targets concern the issues of energy and water consumption, the minimisation of solid waste, the reduction in the use of chemicals and compliance with a number of health and safety issues. The implementation of procedures and actions in order to meet those targets has resulted in the reduction of energy cost by 2% in the Suisse A hotel after the certification.

Energy management

In order to control the hotels' energy consumption a monitoring programme has been established in both hotels. In the Suisse A hotel every month an area manager is a "duty guarantor". This person goes 3-4 times a day through the hotel to check if the light and water is off and if there are no technical faults. The management is informed monthly of the result.

Energy consumption and other consumption are daily monitored by the general manager of the Suisse B and the results are also monthly recorded.

Movement sensors have been installed for the controlled operation of the outdoor lights, also for corridors and many other common areas. Both hotels have installed bulbs with lower energy consumption.

The new building of the Suisse B was awarded to the Minergie label. This Swiss certification can be awarded to new or renovated buildings with high energy efficiency.

Water management

Suisse B and Suisse A have toilet flushers with a full or a half volume option. The hotels apply the change-per-request scheme for linen and towels where guest linen and towels are changed and washed only on their request.

The maintenance department regularly checks tabs and toilets for leaks and takes immediate action when needed. The overall water consumption is monitored daily and archives are kept

monthly by the hotel maintenance department along with water bills and this helps in promptly spotting significant water leaks and identifying opportunities of further water savings.

Waste management

Both hotels have a waste management concept. In Switzerland there is a municipal collection system for recyclable solid waste. Plastic, metal, glass, garden waste and paper are separately collected. The hotels have collecting stations for the separation of these waste streams. Apart from the collecting stations, there is one accumulation station in which waste from the collection stations are transferred daily. Garden organics are separately collected and used for composting. Organic wastes which can be used as animal food are separately collected by farmers. Hazardous waste such as light bulbs, toners, batteries and used mineral oils are separated taken by an authorized company. Solid waste is collected by the municipality and goes to the combustor.

Similarly jam and honey breakfast portions have been replaced with large jars. Dispensers are used for housekeeping cleaning materials and for hand soap in common toilet.

Solid waste quantities are frequently monitored and the total quantity is calculated at the end of each operating period. The disposal costs of the Suisse A hotel sank by 3 % after the certification.

Reduction of the use of chemicals

One of the targets set as part of the hotel's environmental policy is the reduction of chemicals. The hotels have introduced a number of methods in order to reduce chemical quantities or, where necessary, to use more environmentally friendly chemicals.

Suisse B use for cleaning the environmental friendly Jemako products and they also use a unique water treatment which decreases the chemical treatments in swimming pools.

For the moment the Suisse A checks the processes in the cleaning area, they want to achieve higher quality and the same process order. They are also looking for an eco-friendlier cleaning agent and working together with a consultant to improve their processes in the housekeeping department.

Washing of linen and towels on a change-per-request scheme has significantly reduced the amount of detergents used.

Staff briefings, training and public awareness

The cooperation of staff and guests are two important factors contributing to the effective implementation of the Environmental Management System of the hotel. Both hotels lay strong emphasis on staff training and environmental awareness as well as on informing guests on environmental actions and ways to contribute to the scheme implementation.

Newly employed staff in the Suisse A and Suisse B receive an induction training regarding the company's environmental work. The new staff gains knowledge about the environmental management programme of the hotel and about the general environmental work. Additionally, they get information about the environmental impact of the hotel operation and their responsibilities regarding the environmental work that needs to be followed.

Both hotels have eco-targets to sensitise all employees to save energy. Suisse B has an employee suggestion system which puts new ecological inputs in the hotel.

Apart from staff training, the guests' environmental awareness is also an important factor. Information about the hotel's environmental policy and other environmental issues is also provided to the visitors of the hotel. Actions include:
  - The distribution to all guest rooms of an informative leaflet regarding the rational use of water
  - Various notices are also located in bathrooms and public toilet rooms regarding water saving issues
  - Information material of the hotel's environmental policy
  - Various posters on raising awareness on environmental issues have been placed in public areas
  - A card notice is available in rooms informing the guests on the according to their request towels washing programme

Constraints and benefits

Last but not least, the commitment of the top management to the implementation as well as the improvement of the environmental scheme is the key to success. The implementation of the scheme has helped both hotels in reducing its operational costs. With the certification Suisse A and Suisse B have additional administration expenses, but based on long-term consideration the hotel will have a pay back.

With the certifications the Suisse A hotel has improved the image and also the competitive edge. The reason is that companies and also individuals are more sensitive in environmental problems. The hotel has a higher quality now, the guests estimate the improvement and they don't feel patronized.

After EFQM labelling processes are accurately described and they can exactly calculate their process cost. Since the certification they have improved the profitable growth and they are more competitive.

A constraint faced by the management during the implementation of ISO, was the initially negative response from some staff. For example, cleaning staff at Suisse B was particularly negative about using the environmental friendly Jemako instead of chemicals for cleaning. Also the employees of Suisse A resisted the new way of doing things. With a lot of effort on the part of the management in providing training and environmental information the staff became more and more environmental aware and this was an important factor for the achievement of a better environmentally performance. With the training and communication they achieved that the certifications have even more advantages:

- more transparency
- higher quality
- higher standards
- processes are exactly defined

Now the staff feels part of the scheme and helps the management in its improvement.

3.4 Hotels in Jordan

Introduction

By 2006 there were 476 hotels in Jordan with a total of 21'609 rooms and 42'029 beds. The capital of Amman had a total of 325 accommodations with 8'990 employees. Amman was followed by Aqaba, which has 46 hotels, Petra and the Dead Sea. The rest are distributed over other locations.

Tab. 3-2: Hotel locations

Location	Hotels	Employees
Amman	325	8'990
Aqaba	46	1'717
Petra	38	929
Dead Sea	4	1'246

The first three locations included all levels of classified hotels, which is not the case in other locations, which mostly had one or two levels at most for classified hotels in addition to unclassified ones and in very rare cases hotel apartments.

For example, only four and five stars hotels can be found at the Dead Sea, also the only four stars hotel in Ma'in Spa. The opposite can be observed in other locations where one and two stars in addition to unclassified hotels are found. Clear examples come from locations such as Madaba, Ma'an, Jerash, Zarqa, Azraq, Ajlun, Irbid, Karak and Shobak.

Wadi Rum includes an accommodation characterized by camping, which had a total of 5 units with 302 rooms and 607 beds available, which is inconsistent with the relatively large number of visitors.

For the numbers of accommodation types recorded in 2006, the table shows that classified hotels reached a total of 205 hotels. Hotel apartments and suites had a total of 128 units; the unclassified hotels have ended with a total of 131, 2 hostels, 1 motel and 9 camping areas.[34]

Tab. 3-3: Number of hotels, rooms and beds 2006

Classification	Number of hotels	Rooms	Beds
Five stars	22	5'406	9'480
Four stars	23	2'889	5'313
Three stars	45	3'194	6'271
Two stars	55	2'279	4'629
One star	60	1'418	2'947
Total classified	*205*	*15'186*	*28'640*
Apartments B	18	909	1'514
Apartments C	88	2'558	5'045
Suites A	2	63	130
Suites B	10	336	621
Suites C	10	438	978
Total Apartments, Suites	*128*	*4'304*	*8'288*
Unclassified Hotels	*131*	*1'665*	*4'025*
Hostel	2	14	36
Motel	1	11	18
Camping	9	429	1'022
Grand total	**476**	**21'609**	**42'029**

In Jordan 8 hotels from one to five stars were visited during the research further on named Jordan A-H). These hotels give an overview of the hotel sector in Jordan and are distributed at the main tourist areas.

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[34] Ministry of Tourism & Antiquities (2007)

Tab. 3-4:   Hotels visited in Jordan

Hotel	Location	Stars	Guests Arabs	Others
Jordan A	Dead Sea	5	50%	50%
Jordan B	Amman	5	50%	50%
Jordan C	Amman	5	50%	50%
Jordan D	Amman	4	20 %	80%
Jordan E	Petra	3	n/a	n/a
Jordan F	Aqaba	2	75%	25%
Jordan G	Aqaba	1	100%	0%
Jordan H	Petra	1	5%	95%

Action for the environment

All five star hotels in Jordan are part of an international chain. The hotels get standards to follow and benchmarks to reach from the head quarters of the chain. Because of the political complexity around Jordan and the recent terrorist attacks in Amman the top priority is the safety of the guests. Next to the security are the hygiene standards the most important.

They have to set a number of targets in water and energy consumption which are monitored and the results are recorded. There are a few environmental actions they carry out. But they have neither an especially environmental policy nor environmental goals.

Most of the one to three stars hotels are small and family owned hotels. They have no environmental goals and most of them have no environmental awareness. The only reason why they take environmental action, like using energy efficient bulbs or reduced water flow taps in the rooms is to maximise their profit. They have no monitoring system to control the water and energy consumption.

Energy management

All five star hotels have automatic switching off of all lights and electrical appliances when guests leave their rooms: all lights and electrical appliances, apart from refrigerators and air-conditioning systems, automatically turn off when the room key is removed from the magnetic detector, adjacent to the entrance door.

To control the energy consumption all five star hotels have a monitoring programme. According to this programme energy consumption and the amount of fuel used are recorded. Archives are kept monthly by the hotel maintenance department and the top management is informed of the results. The results are compared by the chain with their benchmark and the other hotels.

Most of the hotels from one to five stars gradually started replacing the common bulbs with bulbs of lower energy consumption.

Jordan has very little energy resources, the country imports the main energy resource like oil and fuel from Kuwait, Saudi Arabia, and the United Arab Emirates. Renewable energy is considered the largest domestic energy source. Technical and market potential exists to significantly increase the share of renewable energy sources into Jordan's energy balance, and resulting in employment and economic benefits. But for the moment only the Jordan C Hotel uses renewable energy: The Jordan G does have solar panels but due to bad maintenance there are not working. The investment costs for renewable resources are expensive but the hotels would have a significant reduction in their output and subsequently reduction in fuel consumption. The problem is this is a long-term investment and the management of hotels and the investors here in Jordan have a short-term thinking.

Water management

Hotels are large consumers of water. Tourists use on average 1/3 more water per day than the local inhabitants.

The Jordan A and the Jordan G have their own well. The water from the well comes with a license and is treated on site and then used for consumption.

The five star hotels apply the change-per-request scheme for linen and towels where guest linen and towels are changed and washed only on their request. But in practice they change the linen and towels every day.

Most of the hotels have to get extra water from trucks because the water supply of the municipal once or twice a week is not sufficient.

Waste management

In Jordan there is no municipal collection system for recyclable solid waste. With regard to infrastructure, the lack of a sound recycling scheme, including collection systems, separation facilities and recyclable utilisation markets has inhibited the establishment of a separation scheme for solid waste in hotels. Solid waste is collected in containers and transported by the local municipality council to landfills. None of the hotels has a monitoring system for the solid waste quantities.

Reduction of the use of chemicals

They don't use environmental friendly cleaning products because the costs of such products are typically higher than conventional products. One to three star hotels have no monitoring program of chemicals consumption. In all hotels the toxic waste ends up in the sewage treatment plan.

Staff briefings, training and public awareness

The commitment of the top management to the improvement of the environmental awareness is the key to success.

Most of the one to three star hotels are not sensitive of environmental problems therefore they don't do environmental staff training nor give guests information about the environmental actions.

3.4.1   Environmental Awareness

Hotels

The results show that 95% of the five star hotels are willing to a great extent to undertake a comprehensive environmental program in their hotel, 83% of the four star hotels, 84% of the three star hotels, 53% of the two star hotels and 49% of the one star hotels. These results indicate high level of readiness among five star hotels to implement environmental systems in their hotels.

Moreover, 66% of the hotels were to a great extent willing to undertake a comprehensive environmental program in their hotel.
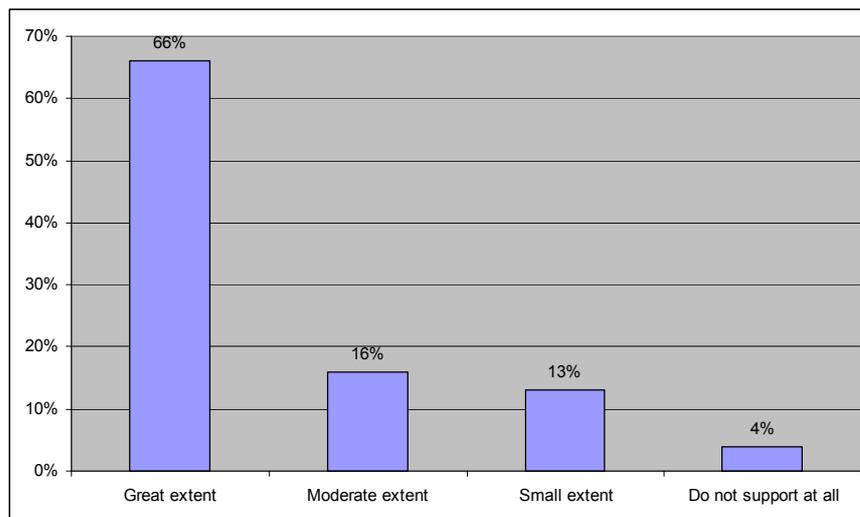
Fig 3-7:   To what extent are you willing to undertake a comprehensive environmental program in your hotel?

All five star hotels mentioned that their hotels are concerned to a great extent about the environment. However, other hotels vary in their extent of concern toward the environment. The results show that 54% of four star hotels, 63% of the three, 72% of the two, and 75% of the one star hotels are concerned to a great extent about the environment.

The results show that 83% of four star hotels expressed high level of willingness compared with 75% of five star hotels with regard to make some modifications in their hotel to get an environmental certificate. Three star hotels and two star were less willing to make some modifications. In general 67% of all hotels, regardless of their classification, were willing to a great extent to make some modifications in their hotel to get an environmental certificate
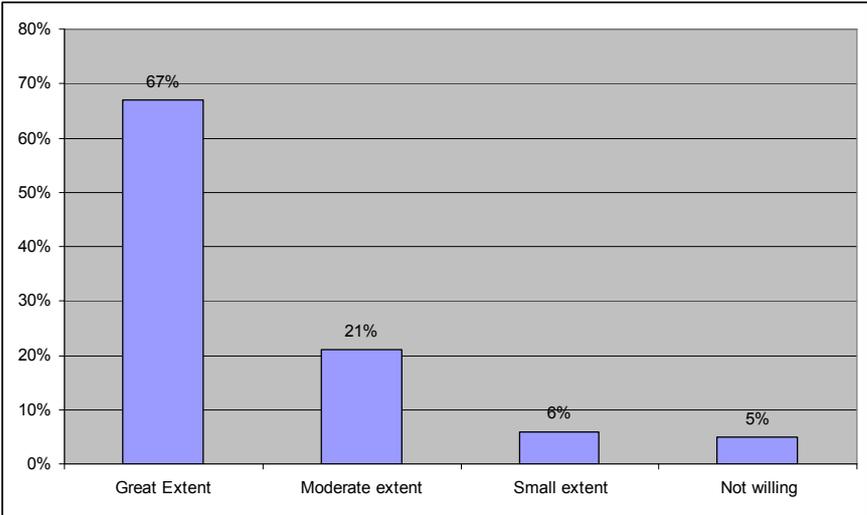
Fig 3-8:   To what extent are you willing to make some modifications in your hotel to get an environmental certification?

The results show that 20% of five star hotels knew about the Eco-label environmental award, 4% four star, 9% three, 8% two and 13% of the one star hotels. The results show that 14% of five star hotels knew about the EMAS environmental award, 9% three star, 13% two star and 13% of the one star hotels. ISO 14001 was the most well known environmental initiatives. The results show that 62% of five star hotels have heard about this initiative, 33% of four star, 50% of the three star, 47% of the two star, and 13% of the one star hotels.
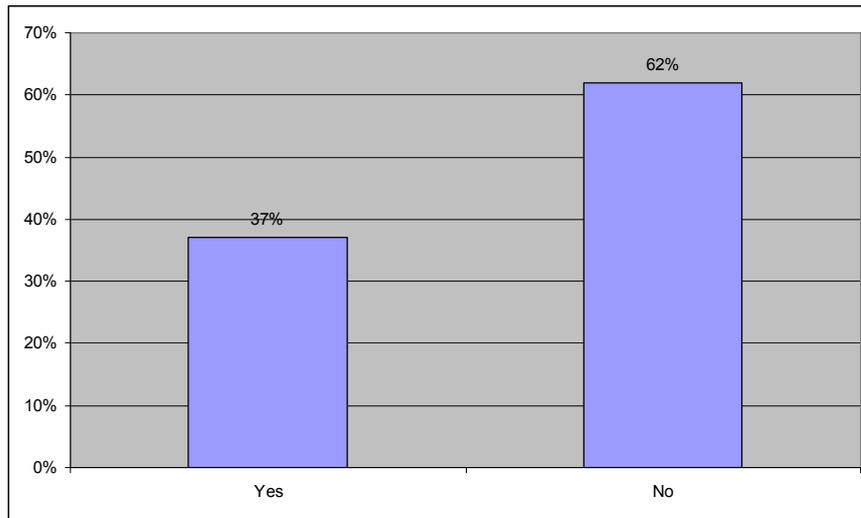
Fig 3-9:   Have you heard about any of the ISO 14001 international environmental initiatives?

Employing an environmental officer is an important indicator among others to show the level of concern of the hotels toward protecting the environment. The results show that 86% of all hotels do not employ an environmental officer in their hotels. 62% of five star hotels do employ an environmental officer, 22% of the four star hotels while none in one star hotels
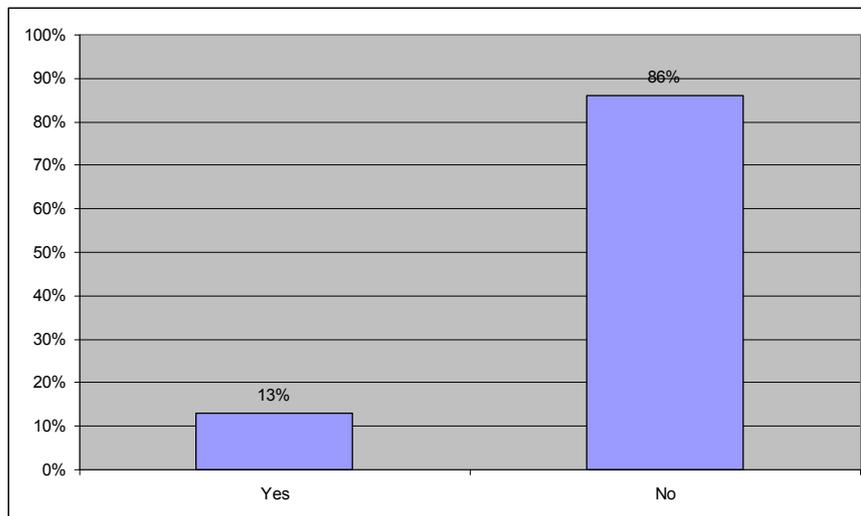
Fig 3-10:   Do you employ an environmental officer in the hotel?

More than 80 percent of hotels mentioned that their hotel has no environmental policy plan. However, around fifty percent of five star hotels mentioned that they have an environmental policy plan, while 17% of the four star, 16% of the three star, and 21% of the two star hotels. Moreover, 91% of five star hotels who have an environmental policy plan trained their employees. Also 80% of the four star hotels, 78% of two star hotels and all the employees of the two star hotels. The results show that 75% of five star hotels have a written policy for energy conservation, 50% of the four star, 47% of the three star, 47% of the two star and 13% of one star hotels.
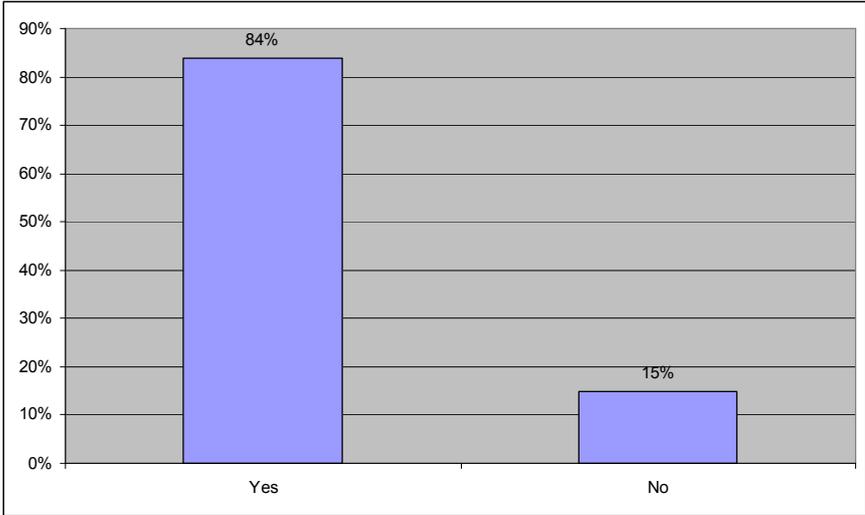
Fig 3-11:   Does the hotel have an environmental policy plan?

Recycling is one of the important measures of environmental concern. The results show a low commitment of hotels in this regard. More than 88% of all hotels do not adopt a recycling program in their hotels. 48% of five star hotels adopt a recycling program, 13% of the four star hotels while there is no recycling program adopted at one star hotels. [35]

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[35] Green-Tas; Determination of the environmental problems
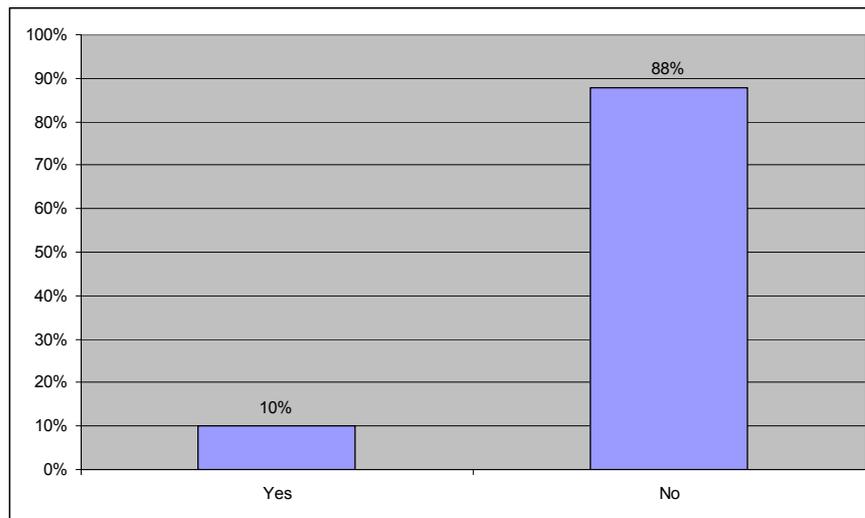
Fig 3-12:   Do you adopt a recycling program?

The results show that 44% of all hotels provide guests with information to save energy while staying in the hotel. 55% of the five star, 38% of four star, and 62% of one star hotels provide guests with information to save energy while staying in the hotel. And 41% of all hotels promote "to a great extent" turning the lights off whenever they are not needed. 62% of one star hotels, 41% of three star, 39% of four star, 27% of five star and 20% of two star hotels promote "to a great extent" turning the lights off whenever they are not needed.

Most of the hotels believe that their guests are to great and moderate extent concerned about the environment. And that 10% of all hotels use renewable energy sources while 59% depend on fossil fuel sources and 31% use both sources. 75% of five star hotels depend on fossil fuel sources and 5% on renewable sources. Also, the results show that 72% of all hotels apply some energy conservation practices in their hotel while 95% of five star hotels apply such practices, 88% of four star hotels, and 62% of one star hotels. More than 59% of all hotels installed equipments to reduce energy consumption for heating, ventilation, air-conditioning in their hotel while 79% of four star hotels installed such equipments, 71% of three star hotels, and 55% of five star hotels.

The results show that 34% of all hotels have water treatment system in the hotel. 81% of five star hotels, and 71% of four star hotel while 13% of one star hotel. [36]
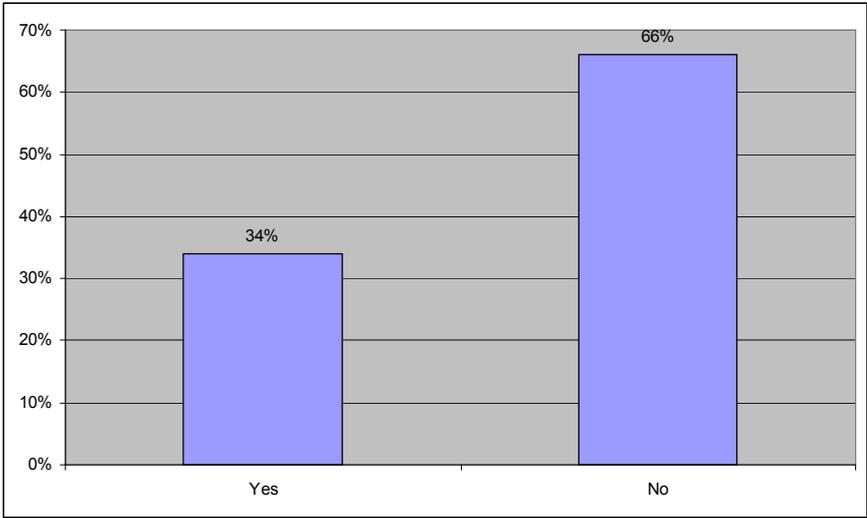
Fig 3-13:   Is there any water treatment system in the hotel?

The results show that 24.3% of all hotels believe that the hotels' designs in Jordan meet the environmental requirements to a great extent and 46.4% believe that the hotel designs meet the environmental requirements to a moderate extent. The results show that 28.4% of all hotels believe that their hotels' designs meet the environmental requirements to great extent and 37.4% believe that their hotels' designs meet the environmental requirements to a moderate extent. 40.0% of five star hotels, 12.5% of four star, 21.4% of three star, 26.4% of two star and 37.7 of one star hotels believe that their hotels' designs meets the environmental requirements to a great extent.

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[36] World Bank; Country Report – Jordan (2004)
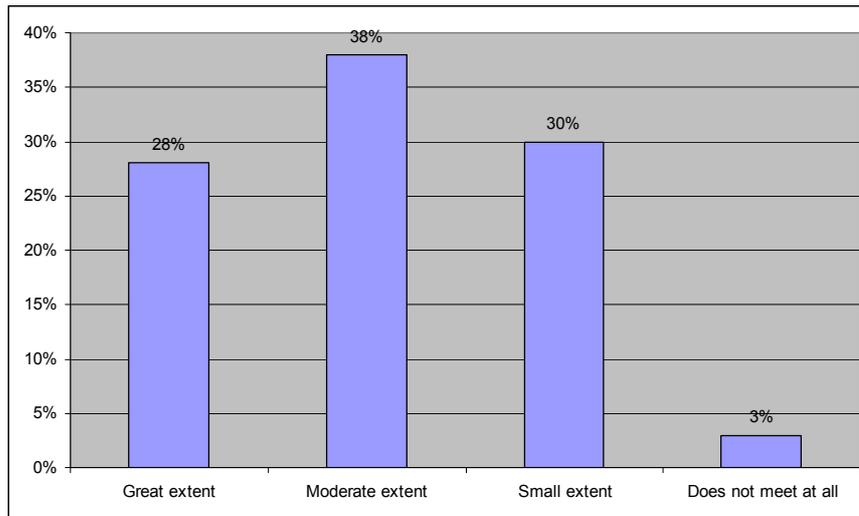
Fig 3-14:   To what extent do you believe that your hotel's design meets the environmental requirements?

3.5   Conclusion

Determining environmental problems requires a thorough description of different actors. Hotels, tour operators and tourists represent the main three groups that help to understand environmental problems that are related to the hotel accommodation services in Jordan.

EMS

Of the systems described only ISO 14001 can be practically applied in Jordan. Jordan's Institution for Standards and Metrology (JISM) is Jordan's national body responsible for standardisation. This organisation is also a member body of the International Organisation for Standardisation. There are four certification bodies in Jordan: Lloyd's, TÜV, SGS and DNV. EMAS and the eco-label scheme cannot be applied as Jordan is not an EU member or candidate neither is a signatory to the European Economic Area agreement. Nevertheless, although the systems themselves cannot be applied at the moment, their characteristics could be used for the development of national systems or schemes. Thus, eco-label criteria for the tourist accommodation sector could serve as guidelines in identifying the measures to be applied for the improvement of an accommodation's environmental performance, whereas EMAS framework should be considered when establishing an EMS and the following principles on which EMAS is based could be followed:

- Active participation of employees in the environmental improvement programme.
- Emphasis on the improvement of the organisation's environmental performance.
- Compliance with the relevant environmental legislation
- Compatibility of suppliers and contractors with the organisation's environmental policy.

- Relatively short audit cycle.
- Publicly available environmental statement including the policy, programme, environmental management system and details on the organisation's performance.[37]

However, at this time no hotel in Jordan is awarded with an eco-label.

Example Hotels from Switzerland

The experiences of Switzerland showed that with the certification the hotels made an improvement in quality as well as enabling them to reduce their costs. With the certifications they have now a good image and can promote their hotel.

The commitment of the top management to the improvement of the environmental awareness is the key to success.

The critical success factors are that the top management implement the system with a lot of communication and training for the employees as well as informing guest on environmental actions.

The factors are:
- Top down
- Management skills
- Communication
- Training/Awareness of employees

Hotels in Jordan

In general the four and five stars hotels in Jordan are willing to undertake an environmental program. 66% of the hotels were to a great extent willing to undertake a comprehensive environmental program in their hotel. But currently only 20% of the hotels do even have an environmental policy and not even 15% employ an environmental officer. Only 10% of the hotels in Jordan use renewable energy sources while 59% depend on fossil fuel and 31% use both sources.

This shows that the hotel management is aware about the problems but they don't behave accordingly. Not even at the Dead Sea do they use solar energy. Most of the five star hotels do have a change-per-request schema for the towel but they don't utilize it.

Hotels in Jordan don't use eco friendly chemicals. They don't have a monitoring of waste production and they have an extensive use of water. Most of them use water saving taps and energy saving bulbs but mainly for financial reasons.

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[37] Green-Tas; Evaluation of Alternative Environmental Systems (2006)

Leadership and Management Commitment are crucial for the establishment of a comprehensive EMS. Excellent organisation's senior leaders are committed to set and communicate clear and consistent strategies, which involve the participation of all organisational levels. By doing so, they inspire the employees and all stakeholders, providing an ideal structure for the implementation of any strategy. The development, implementation and improvement of policies and strategies reflect or prove management commitment.

Achieving outstanding performances should also be the responsibility of employees throughout the organisation. In order to get such "commitment" from them, high levels of motivation are required. Hotels could increase their employees' motivation by a continuous training, by increasing their technical capacities thus making them feel as key contributors to the fulfilment of global objectives and targets.[38]

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[38] Cleaner Production Excellence Model (2007)

4 Marketing Aspects

To sell any kind of product you need customers and a distribution partner. The relationship of the hotel with the tour operator or incoming agents is very important. They are the most important customers and have a lot of influence.

An eco-label is therefore useful to support the promotion and to position the hotel in the market. To sell the product the importance of marketing increased. With a certification or award the hotel can show that they have a certain standard and think about their environment.

4.1 Tourists in Jordan

Introduction

The number of tourist arrivals in Jordan reached 6'573'669 tourists in 2006. For the arrivals of 2006, about 3'225'411 tourists were overnight visitors, while 3'348'258 were considered as same day visitors.[39]

Tab. 4-1:   Overnight and same day visitors by 2006 (without resident)

Nationality	Same day visitors	Overnight visitors	Total	%
Arabs	3'019'441	1'918'736	4'938'177	75.3%
European	218'943	424'584	634'528	9.7%
Jordanians Residing Abroad	20'927	576'980	597'907	9.1%
America	35'293	163'917	199'210	3.0%
East Asia	29'597	82'943	112'540	1.7%
South Asia	19'706	41'884	61'590	0.9%
Africa	3'051	11'476	14'526	0.2%
TOTAL	**3'346'958**	**3'220'520**	**6'558'478**	**100%**

Most of overnight visitors were either from Arab countries (60%), Jordanians residing abroad (18%) or from European countries (13%).

American tourists were 199'210 individuals, Asian tourists with a total of 174'130 tourists and African countries tourists were 14'526 individuals.

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[39] Ministry of Tourism & Antiquities (2007)

Amman had the highest number of overnight stays with 3'491'162 for 2006, followed then by Aqaba with 715'496, Petra 400'936 and then the Dead Sea with 270'816 overnight visitors. [40]

Tab. 4-2: Nights spent in main location 2006

Location	Nights spent
Amman	3'491'162
Aqaba	715'496
Petra	400'936
Dead Sea	270'816

Interesting is the number of nights spent by category. While the five star hotels only represent 4.6% of all hotels nearly 40% of all nights were covered by them. [41]

Tab. 4-3: Nights spent by category 2006

Classification	Nights spent
Five stars	1'507'340
Four stars	940'281
Three stars	720'156
Two stars	416'530
One star	211'233

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[40] Ministry of Tourism & Antiquities (2007)

[41] Ministry of Tourism & Antiquities (2007)

The survey of the Green-Tas project show a high level of concern toward the environment among all guests in the hotels. Around 50% of the guests mentioned that they are concerned to a great extent about the environment. However, there is an increase in the level of concern among guests in the five star hotels compare with other hotels. The results show that 22.5% of the guests at the one star hotels think that the hotel cares to a great extent about the environment, while 23.7% of the two star hotels, 25.0% of the three star hotels, 28.4% of the four star hotels and 38.2% of the five star hotels. This indicates that hotel classification is an important indicator when addressing the issue of the environment. However, 52.5% of all respondents believe the hotel where they are staying cares about the environment.[42]
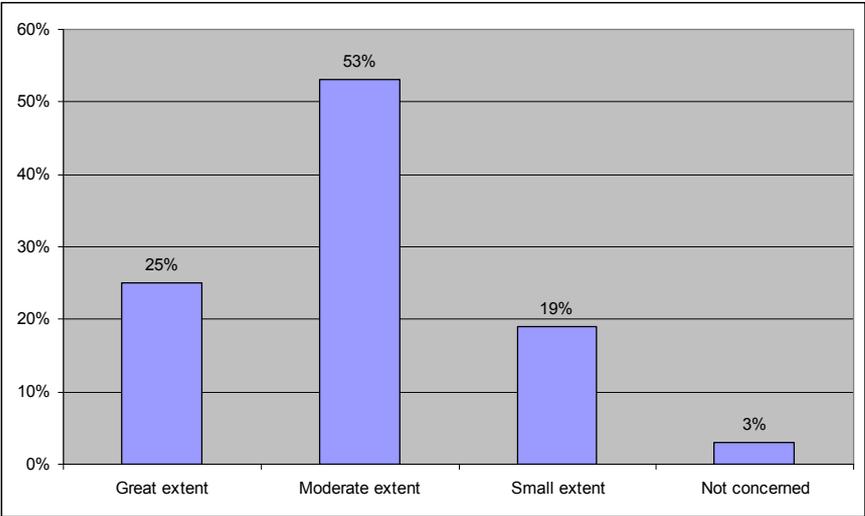
Fig 4-1:   To what extent do you think that this hotel cares about the environment?

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[42] Green-Tas; Determination of the environmental problems

The guests are very much in favour of staying in a hotel that cares about the environment. The results show 86% of respondents at the one star hotels, 78% of the two star, 89% of the three star hotels, 89% of the four star hotels and 93% of the five star hotels all preferred to stay in a hotel that cares about the environment.[43]
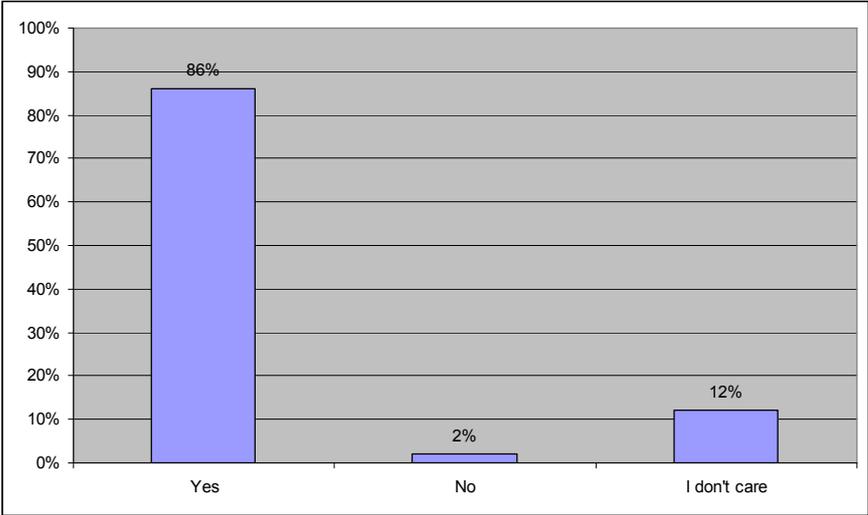
Fig 4-2:   Would you prefer to stay in a hotel that cares about the environment?

[43] Green-Tas; Determination of the environmental problems

The guests support the idea of reducing energy consumption by using energy efficient appliances. The results show 86% of respondents at the one star hotels, 81% of the two star, 86% of the three star hotels, 85% of the four star hotels and 90% of the five star hotels were all in agreement with the idea of reducing energy consumption by using energy efficient appliances.[44]
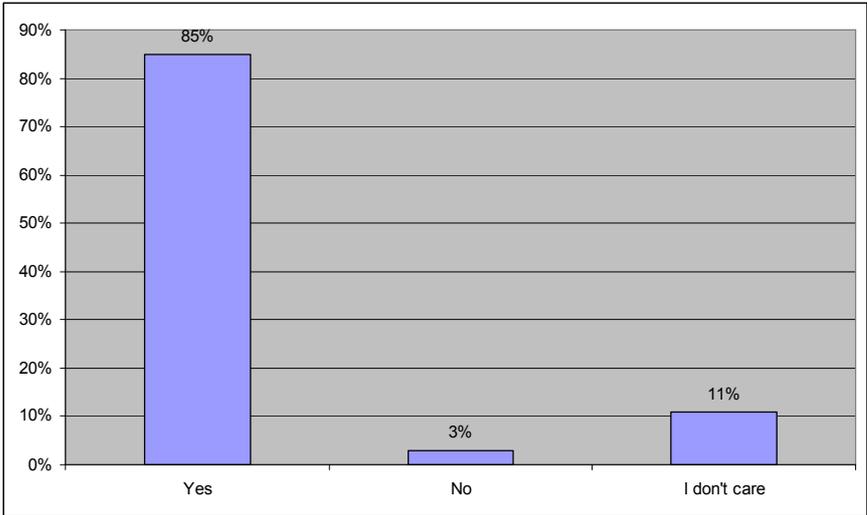
Fig 4-3:   Do you agree with the idea of reducing energy consumption by using energy efficient appliances?

[44] Green-Tas; Determination of the environmental problems

Respondents show an interesting attitude to using recycled treated wastewater for the irrigation of hotel landscaping and golf courses, more than two thirds of them were in agreement with the idea regardless of their hotels' classification.[45]
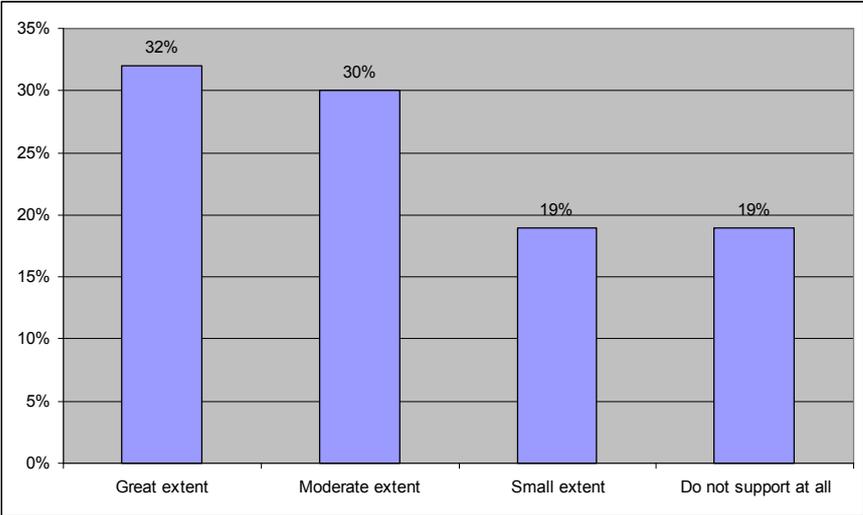
Fig 4-4: To what extent do you agree to use recycled treated wastewater for the irrigation of the hotel landscaping and golf courses?

[45] Green-Tas; Determination of the environmental problems

Another question is the cleaning of the towels and linen. The results show that 39% of guests are willing to use the towels two time before sending them for washing at the hotel, while 28% for one time and 12% for four times. [46]
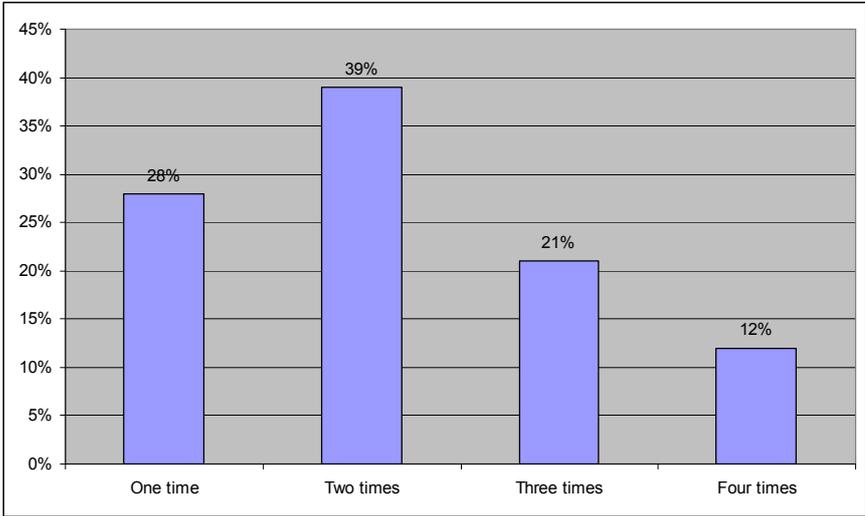
Fig 4-5:   How many times would you be willing to use the towels before sending them for washing at the hotel?

4.2   Swiss Tour Operators

4.2.1   ESCO

Esco-Reisen is part of the Hotelplan group which is one of the biggest international companies in the tourism sector in Switzerland. They offer two round trips in Jordan and the clients have a choice of several hotels at the Dead Sea and Aqaba. For Hotelplan Jordan is only a niche product with not a lot of turnover.

Target customers

The average client is older than 40, well educated and prepared for the trip. He is Swiss and makes either a beach or culture holiday. Customers who go to Jordan because of the culture are often linked to the religion and want to see the archaeological sites in this context.

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[46] Green-Tas; Determination of the environmental problems

Hotel selection

The hotels are in the upper segment, mostly five star. For the round trips the local agencies are in charge of the selection. To choose the hotel at the Dead Sea they work with the Swiss cross. This is a quality sign for the customers and the most important point. Hotelplan has its own environment award. If a hotel fulfils those criteria this is mentioned in the catalogue.

4.2.2 Sina Orient Tours

Sina Orient Tour is a small tour operator located in Muttenz. They are specialised in the Middle East and Northern Africa. The owner is a consultant of the Royal Society for the Conservation of Nature (RSCN) and owns an Eco-Hotel in Egypt.

Target customers

The current average customer is more than 55 years old, coming from the Swiss-German part and is well educated. He comes from the upper class and is very well prepared for the journey. He is sensitive to sustainability and interested in nature. By choosing Sina Orient Tours he already made the first choice towards ecological holidays.

Most of the clients are interested in archaeology and have a connection to the Antikenmuseum Basel. The others come because of the stunning environment.

They travel as individual tourists and not in groups. Not all of the interesting points can be reached by public transport. Therefore the means of transportation is in nearly every case a rented car with a driver.

Hotel selection

The main goal of the selection is that the money stays in the country. Because of that the customers spend the nights most of the time in Hotels owned by locals and not in hotels owned by big chains. The range is from campgrounds to five star hotels depending on the location and the availability.

An exception is Aqaba because there it is very difficult to find such hotels.

For Sina Orient Tours certificates are useless. Nowadays there are so many labels that it is not possible to know what are the terms and conditions of each certificate. To get more transparency the owner proposes an award. Her experience shows that in Arab countries people are looking for awards. There could be as example a yearly Award to the hotel which made the most progress in his category or the one which uses least water per SEPR.

4.3   Jordanian Tour Operator

Tour operators in Jordan expressed a high level of concern toward the environment with 78% mentioning that they are concerned to a great extent and 13% to a moderate extent. Only 25% of tour operators are members at any environmental society. The results show that 38% of tour operators consider littering as the most important environmental problem that concerns them the most, while 28% consider air pollution to be the environmental problem that concerns them the most. They were concerned with littering with 33% and energy consumption and water pollution with 18% for each one of them. Thus, 68% of tour operators strongly agree that recycling is an effective way to protect the environment, and 28% agree. Tour operators were very optimistic when mentioning that they are 75% thinks that to great and moderate extent that hotels care about the environment, while only 8% of them think that hotels do not care about the environment. However, 42% tour operators believe that hotels' performance with regard to protecting the environment is good, while 13% believe that hotels' performance is poor. The majority of tour operators (90%) prefer to send tourists to a hotel that cares about the environment.
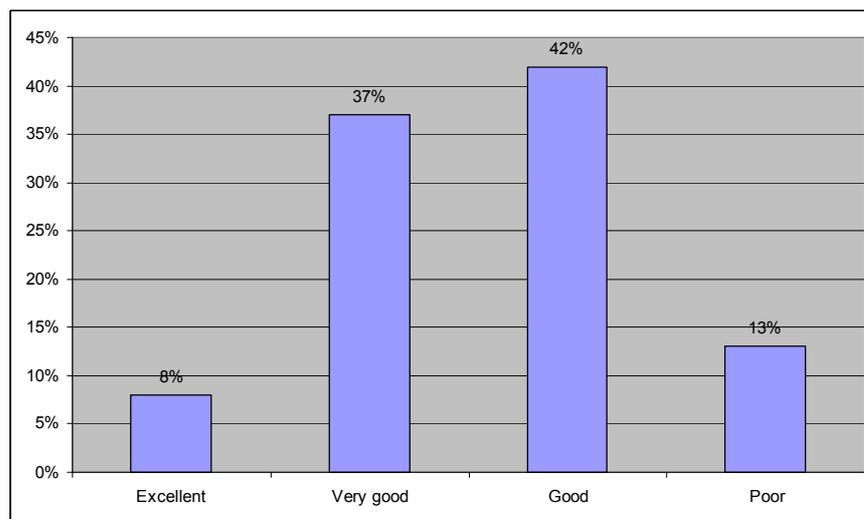
Fig 4-6:   What is your evaluation for the hotel's performance with regard to protecting the environment?

The majority of tour operators (60%) believe that hotels do not have an environmental policy plan, while 49.0% believe that hotels do have an environmental policy plan. And 83% of tour operators believe that environment is important to the tourists.

Tour operators strongly agree and agree with 73% that hotels might play a role in improving environmental concern of their employees, while only 5% strongly disagree. However, the results

show that 53% of tour operators strongly agree and agree that hotels overuse fresh water sources for its pools, while only 33% disagree and strongly disagree. Also, 48% of tour operators strongly agree and agree that hotels overuse fresh water sources for irrigating their green areas, while only 33% disagree and strongly disagree. [47]
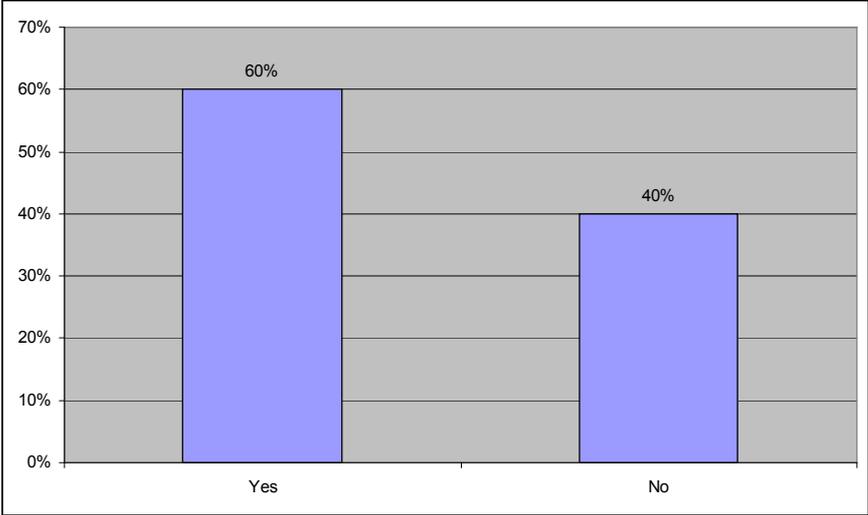
Fig 4-7:   Do you think that the hotels have an environmental policy plan?

The results show that 58% of tour operators strongly agree and agree that hotels overuse fresh water sources for the personal use of guests, while only 31% disagree and strongly disagree. Moreover, the results show that 58% of tour operators strongly agree and agree that hotels contribute to the generation of waste water, while only 21% disagree. On the other hand 45% of tour operators strongly agree and agree that hotels contribute to the generation of solid waste, while only 18% disagree and strongly disagree. Also, the results show that 75% of tour operators strongly agree and agree that hotels highly contribute to the overuse of electricity, while only 18% disagree and strongly disagree.

Only 23% of tour operators who provide tourists with information to save energy while staying in hotels. In general 48% of tour operators believe to moderate extent that hotels promote friendly environmental behaviours and 30% to small extent. Majority of tour operators (95%) do not include any minimum environmental requirements into the contracts they sign with hotels. [48]

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[47] Green-Tas; Determination of the environmental problems

[48] Green-Tas; Determination of the environmental problems
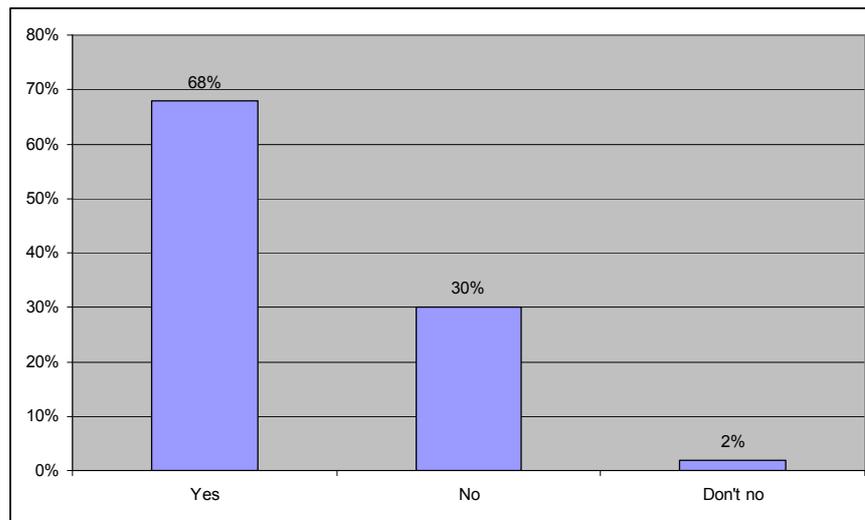
Fig 4-8: Do you provide tourists with information regarding appropriate environmental behaviour in the host environment?

4.4 Conclusion

The survey shows that the potential to use an environmental certification in Jordan is little. The tour operators have no standards for the environment and therefore there is no influence to force the hotels toward sustainability. Around 78% of the guests come from Arab countries or are Jordanians from abroad, so that the hotels fulfil their requirements first. The awareness of those tourists toward environmental problems is not at a high level.

Around 13% of the hotel customers come from the European countries, where environmental awareness and sensitivity are at a high level, so it is quite easy to convince them to follow environmentally friendly procedures during their accommodation the hotels. European Countries are far ahead concerning environmental issues compared to Jordan thus, the hotels have to set an environmentally friendly policy to reach the expectations of this clientele. Eco-labels recognised all over Europe would give this opportunity.

For the Arab tourist an award would be the better option. They are keen on awards and the recognition is higher than for a certification.

Without action from the government the environmental behaviour of the hotels will not change.

Swiss Tour Operators

The most important clients of a hotel are the international tour operators. They set the standards and the hotels have to follow them if they want to stay in their catalogues.

The big international tour operators from Switzerland have their local agencies who are in charge of choosing the hotel for the round trip. The other hotels they choose on their own.

Jordanian Tour Operators

The results showed that the tour operators in general are aware of the problem concerning the environment. But this behaviour does not cover this.

Even if more than 80% of the tour operators believe that the environment is important to the tourists only 5% include minimum environmental requirements into the contracts they sign with hotels. They agree that the hotels overuse water and electricity.

Tour operators strongly agree and agree with 73% that hotels might play a role in improving the environmental concern of their employees.

5 Cost and Consumption

5.1 Benchmarking for Hotels

Environmental benchmarking is a quantitative process that can help to compare a hotel's current performance against industry and competitor standards and to find out what needs to be improved. Benchmarking is an integral tool within the environmental management process that assesses environmental performance and helps to identify and prioritize areas to manage. It is impossible to measure environmental success without knowledge and data on current and past practices. The hotels must be able to show continuous improvements in actual terms. Benchmarking helps assess the potential cost saving that could came from actions to improve performance.[49]

Advantages of benchmarking

The main advantages of a benchmark system are:

- Contributes to lower pollution and saving of water, waste, energy and non-renewable resources
- Helps managers be more strategic in their planning and operations through product differentiation and cost saving
- Keeps ahead of imminent legislation and other regulation penalties
- Improves staff morale
- Reduces manpower and operating costs
- Helps control costs and manage risk through the identification of weaknesses

Implementing a benchmark

There are some actions which have to be taken to implement a benchmark.

- Get staff support (set up environmental teams and determine current level of staff)
- Undertake an environmental check, calculate utility costs for:
  - Laundry
  - Kitchen
  - Guest rooms
  - Air-conditioning
  - Pool & health club
  - Food and beverage
  - Gardens
- Compare hotel totals against industry benchmarks

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[49] Saladino umweltprojekte

- Find out excess consumption and calculate costs

- Prepare an action plan to get realistic goals (maintenance and operational cost)

- Implement the action plan

- Calculate payback

- Establish a monitoring programme for ongoing benchmarking

- Monitor progress

Analyses show that most hotels can reduce energy consumption by 20 to 40 percent while maintaining guest comfort. In order to do so, hotels need to benchmark performance from year to year to be able to monitor and improve it.

Benchmark figures

To calculate a benchmark it is very important to have a base. In Switzerland benchmarking values are usually calculated per "Service Energy Performance Rate" (SEPR):

> Number of Guest nights (accommodation in a year)
> + 1/3 of guest warm dishes
> + 1/3 of health club visitors or spa
> + 1/6 of staff night
> + 1/6 of staff warm dishes
> = Service Energy Performance Rate (SEPR)[50]

Benchmark in Jordan

According to the situation in Jordan the following benchmarks will be evaluated in this study:

- Energy consumption per square metre of serviced space

- Energy consumption per SEPR

- Water consumption per guest night

- Water consumption per SEPR

- Energy cost in percent of revenue

The controlling and monitoring of cost and consumption in Jordan is, except from the five star hotels, at a low level. To be able to compare the hotels in Jordan the guest nights, the turnover and the serviced space are used as base. Due to a low level of controlling and monitoring these are the only available figures. No hotel has the accumulation of waste so there can not be a comparison in this topic.

To get a first overview of the hotels in Jordan the data of eight hotels were collected and compared with two hotels in Switzerland. While the Swiss hotels are a four and a five star hotel the hotels in Jordan cover the whole range from one to five stars.

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[50] Saladino umweltprojekte

Tab. 5-1:   Data form Hotels

Hotel	Guest night	Electricity	Water m3	Waste kg	Fuel litre	Serviced space m2	Energy cost JD	Revenue Mio JD
Suisse B	35'878	1'461'216	26'714	n/a	176'285	9'780	191'599	5.260
Suisse A	14'233	652'224	13'599	84'820	40'000	1'890	199'777	5.500
Jordan A	126'889	10'408'247	86'334	182500 - 365000	535'460	51'320	811'682	10.030
Jordan B	87'470	4'683'997	68'283	n/a	518'052	26'052	457'558	7.400
Jordan C	69'606	9'096'746	100'938	n/a	646'975	55'783	847'267	n/a
Jordan D	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jordan E	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jordan F	28'248	294'902	5'777	n/a	13'929	3'500	22'879	0.350
Jordan G	n/a	n/a	8'760	n/a	n/a	1'900	12'000	0.144
Jordan H	1'263	12'073	247	n/a	1'350	346	1'457	0.015

n/a = not available

To compare the hotels with the SEPR only the five star hotels from Jordan were taken. Because most of the hotel only estimate the spa and wellness visits the calculation is without them.

Tab. 5-2:   SEPR (without wellness)

Hotel	Guest nights	Meals	Staff meals	Staff overnights	SEPR
Jordan A	87'470	118'573	123'443	0	**147'568**
Jordan B	35'878	87'270	28'350	0	**69'693**
Jordan C	126'889	317'945	160'600	2'311	**260'023**
Suisse A	69'606	391'449	227'235	0	**237'962**
Suisse B	14'233	839'500	7'900	0	**295'383**

5.1.1 Energy Consumption per square metre of serviced space

To compare the energy consumption one of the methods is to the electricity consumption per square meter of service area. For Jordan an excellent five star hotel would need less than 140 kWh while an excessive hotel needs more than 175 kWh.

Tab. 5-3:   Benchmark electricity consumption (in kWh per m^2 service space)

Hotel segment	Excellent	Satisfactory	High	Excessive
Luxury fully serviced hotels	< 140	140 – 150	150 – 175	> 175
Mid range serviced hotels	Insufficient data	70 – 80	80 – 90	> 90
Small & budget serviced hotels	Insufficient data	60 – 70	70 – 80	> 80

In Switzerland there exists another benchmark. Here the base is the SEPR. This shows the electricity consumption in comparison with the services. An excellent hotel uses less than 12 kWh per SEPR. [51]

Tab. 5-4:   Benchmark electricity consumption (in kWh per SEPR)

Hotel segment	Good	Satisfactory	Excessive
All hotels	< 12	12 – 18	> 18

5.1.2 Water Consumption

The best way to compare the water consumption is to use the guest nights. The benchmark for a luxury hotel is 600 litre of water. [52]

Tab. 5-5:   Benchmark water consumption (in m^3 per guest night)

Hotel segment	Excellent	Satisfactory	High	Excessive
Luxury fully serviced hotels	< 0.60	0.60 – 0.75	0.75 – 1.10	> 1.10
Mid range serviced hotels	< 0.45	0.45 – 0.60	0.60 – 0.95	> 0.95
Small & budget serviced hotels	< 0.22	0.22 – 0.25	0.25 – 0.38	> 0.38

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[51] Saladino umweltprojekte

[52] Benchmarkhotel

Again you can also compare the water consumption per SEPR to see the consumption of the services. [53]

Tab. 5-6:   Benchmark water consumption (in m^3 per SEPR)

Hotel segment	Good	Satisfactory	Excessive
All hotels	< 0.14	0.14 – 0.22	> 0.22

5.1.3 Waste Production

In Jordan it is very difficult to compare the waste accumulation. Only very few hotels have utilizable data. To beat the benchmark an excellent hotel has to produce less than 0.6 kg of waste per guest night. [54]

Tab. 5-7:   Benchmark waste production (in kg per guest night)

Hotel segment	Excellent	Satisfactory	High	Excessive
Luxury fully serviced hotels	< 0.60	0.60 – 1.20	1.20 – 2.00	> 2.00
Mid range serviced hotels	< 0.40	0.40 – 1.00	1.00 – 1.50	> 1.50
Small & budget serviced hotels	< 0.60	0.60 – 0.80	0.80 – 1.50	> 1.50

5.1.4 Energy Cost

A first indictor for the hotel is the energy cost in percent of revenue. While a good hotel in Switzerland need less than 3% of the turnover for energy in Jordan the cost structure is different and therefore the percentage is supposed to be higher than in Switzerland.

Tab. 5-8:   Benchmark energy cost (in percent of revenue) [55]

Hotel segment	Good	Average	Bad
Hotel with small/without restaurant	< 3.0%	3.0% – 4.2%	> 4.2%
Hotel with big restaurant	< 2.5%	2.5% – 3.7%	> 3.7%

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[53] Saladino umweltprojekte

[54] Benchmarkhotel

[55] Hotelpower

5.2 Evaluation

5.2.1 Energy Consumption per square metre of serviced space

No hotels beat the benchmark except from the Jordan H.

Tab. 5-9: Electricity consumption (in kWh per m^2 service space)

Hotel	Electricity consumption	Benchmark
Jordan A	203	140
Jordan B	180	140
Jordan C	163	140
Jordan D	n/a	140
Jordan E	n/a	70
Jordan F	84	60
Jordan G	n/a	60
Jordan H	35	60
Suisse A	345	140
Suisse B	149	140

The comparison with the SEPR shows that the Swiss example hotels are a lot better than the hotels in Jordan.

Tab. 5-10: Electricity consumption (in kWh per SEPR)

Hotel	Electricity consumption	Benchmark
Jordan A	40.03	12
Jordan B	31.74	12
Jordan C	38.23	12
Suisse A	2.21	12
Suisse B	20.97	12

5.2.2 Water Consumption

The surprise for the water consumption is that the small hotels are better than the benchmark. But all luxury hotels overuse water. There is a significant difference between the five star hotels. So the Jordan C uses more than double the amount of water than the Jordan A.

Tab. 5-11: Water consumption (in m^3 per guest night)

Hotel	Water consumption	Benchmark
Jordan A	0.680	0.600
Jordan B	0.781	0.600
Jordan C	1.450	0.600
Jordan D	n/a	0.600
Jordan E	n/a	0.450
Jordan F	0.203	0.220
Jordan G	n/a	0.220
Jordan H	0.196	0.220
Suisse A	0.955	0.600
Suisse B	0.745	0.600

The water consumption per SEPR (without wellness visits) shows another picture. Still the consumption is way above the benchmark but differences between the hotels are smaller. Only the Suisse A beats the bench this because of the relation between the restaurant and the hotel.

Tab. 5-12: Water consumption (in m^3 per SEPR)

Hotel	Water consumption	Benchmark
Jordan A	0.332	0.140
Jordan B	0.463	0.140
Jordan C	0.424	0.140
Suisse A	0.046	0.140
Suisse B	0.383	0.140

5.2.3 Waste Production

Due to the non-existant recycling system no hotel in Jordan has waste data. The available data are estimations with no validity. Therefore comparison and benchmarking make no sense.

5.2.4 Energy Cost

The cost structure in Jordan is different to Switzerland. Due to this the validity is not high. But it gives a first impression of which hotels in Jordan overuse energy.

Tab. 5-13:   Energy cost (in percent of revenue)

Hotel	Energy cost	Benchmark
Jordan A	8.09%	2.5%
Jordan B	6.18%	2.5%
Jordan C	n/a	2.5%
Jordan D	n/a	2.5%
Jordan E	n/a	3.0%
Jordan F	6.54%	3.0%
Jordan G	8.33%	3.0%
Jordan H	9.72%	3.0%
Suisse A	3.63%	2.5%
Suisse B	3.64%	2.5%

5.3   Conclusion

According to the low level of controlling and monitoring in the hotels in Jordan the figures are often estimations. From the Jordan D no figures at all are available. They are located in a complex together with the Jordan Tourism Board, the Jordan Applied University and a Duty Free Shop. This whole complex has only one counter for electricity and water consumption.

To implement a benchmark system in Jordan the first step has to be a monitoring system for the consumption. The data base is insufficient to successfully compare the hotels with a benchmark.

The only significant numbers come from the five star hotels. There it is remarkable that the Jordan C uses 1450 litres of water per guest night. In comparison the Jordan B needs only 781 litres per guest night.

Overall there has to be a lot of improvement in the controlling because you can't manage what you can't measure. Without knowing the consumption no improvement can be achieved.

6   Suggestions

6.1   Political Framework

Environmental education needs to be improved on all levels of public education. Programmes raising the level of environmental awareness need to be extended to include people involved in vocational training. Environmental sciences should be taught in all fields of higher education as an indispensable part of general education.

To promote environmental awareness at school special emphasis it places on environmental issues in various aspects of school life, such as school camps and in particular school projects.

Requirements for teaching qualifications should include curriculum components related to environmental education.

It is also really important to inform and educate the public about environmental problems affecting them in Jordan. Information notices on the rational use of water, the rational use of high energy consumption devices, the rational use of chemicals and waste separation.

With a media campaign, road-shows or leadership training courses this information could be given to the public. The government could organise events to promote environmental behaviour. For example a festival which uses only renewable energy.

Environmental protection should be ensured within their respective competences and responsibilities by the state and municipalities. To enforce the environmental law and regulations there should be laws about maximum permissible value and minimum standards. Also there ought to be more physical presence of the environmental police and they should do more environmental controls. Therefore more comprehensive environmental police need to be deployed to monitor the governmental and private-sector activities. High fines can scare potential polluter.

Responsible fulfilment of the relevant environmental law and regulation requires an informed public. Therefore the hotel management have to be informed about the rules of conduct, standard guidelines and law modification. It is also important that the Ministry of Environment, the Hotel association and the hotels stay in close contact.

The hotels should be forced to implement an environmental policy.

6.1.1   Water

Prevention of groundwater pollution and compliance with statutory requirements must be achieved. Treatment through the public network is the best option, however, only applicable where the infrastructure exists, which is rarely the case in sparsely populated resort areas. The cost of

treatment options varies, but typically the use of public network is cheaper whereas the operation of an on-site treatment facility is the most expensive option. Nevertheless through the latter option, direct utilisation of treated water for irrigation is possible.[56]

All hotels should have a waste water treatment plant. New hotels shall only be allowed if they are either connected to the public network or they have their own waste water treatment system.

6.1.2 Energy

To develop renewable and sustainable energy sources financial incentives like subsidising sustainable energy sources are recommended. Also an international co-operation with technical experts in the field of sustainable energy sources would improve the missing technical knowledge. Raising the cost for fuel and electricity in the hotel sector through taxes is another possibility to reduce consumption.

6.1.3 Waste

The absence of a national solid waste management strategy and a solid waste law is perceived to be the major obstacle to the development of an effective solid waste management sector in Jordan. There are no defined objectives, priorities or standards for solid waste management in the country. This situation prevents the creation of properly organised, regulated and cost-effective waste management services and acts as a major disincentive to the involvement of the private sector in the development of an integrated solid waste management industry. The legal framework needed to encourage private involvement in the provision of solid waste management services is absent.

The first priority is to formulate national policy, setting out the Government's aims and objectives for solid waste management in the country and the broad principles on which these are to be achieved. The main legal priority is to develop legislation to provide legal support for the planning, application and administration of modern waste management technologies in ways that meet statutory minimum environmental standards and norms. In order to develop such national solid waste policy and law there is a need for a clear and dispassionate evaluation of the current solid waste management situation in Jordan.

A national strategy is needed for solid waste management. Development of the strategy would involve securing sufficient funds and identifying national and international expertise to work on its

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[56] Green-Tas; Evaluation of Alternative Environmental Systems

preparation. It should also involve the participation of all interested parties, including private solid waste operators, and be responsive to their inputs.

Capacity to manage integrated solid waste management systems and technologies is weak, and Jordanian experience with some of the systems and technologies used in modern waste management programmes is limited. Consequently, a wide range of capacity requirements needs to be addressed. However, greater participation by the private sector in the solid waste sector can be expected to address many of these capacity constraints. This should happen automatically as private contractors compete to provide the most appropriate and cost-effective solutions, but a duty of the private sector would be to improve staff capacity through training and doing.

Recycling activities at waste disposal sites are poorly organized, subjecting workers to significant health and safety risk. Waste separation methods, in particular, expose workers (including children) to major hazards. A more formal role for the private sector, operating under properly regulated conditions, would encourage the development of a consolidated recycling and materials recovery industry as part of the wider waste management industry.

The main technical priorities are to facilitate integration of materials recovery into the economy and to improve waste disposal methods. This will result in:
- Greatly improved performance in the recycling sector through better quality, quantity and market prices for recovered materials
- Significant reduction in the threats to public health and environmental quality currently posed by waste disposal sites and management practices.

Other priority actions include the following:
- Strengthen public awareness activities delivered by the Government and non-governmental organizations working in the field of solid waste management.
- Strengthen cost recovery of solid waste management services especially to encourage the participation of the private sector.
- Develop environmental and technical standards for the waste management sector and the procedures for siting different types of waste management [57]

6.2   Management Aspects

The effort to implement a new environmental thinking has to come from the top management. They shall take the lead and convince the employees to follow.

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[57] World Bank; Country Report – Jordan (2004)

Important is the training of management prior to the implementation of a scheme. An introduction to the requirements of an Environmental Management System and on the procedures to be followed by suitable environmental consultants is very important. This informs the management about the procedures to be followed for the preparation of the system and helps to take a decision whether to proceed to implementation prior to further resource commitment.

New employees should be introduced to the hotel's environmental programme. This is a necessary action in order to gradually involve the staff in the scheme. Regular staff training courses on various topics (rational use of detergents and chemicals, separation of waste / hazardous waste, ways to reduce electricity and water consumption, general environmental issues) improves the effectiveness of the system by providing staff the opportunity to be informed on the hotel's new environmental actions. Any problems faced in implementation shall be discussed. New solutions are sought through discussions between the employees of the different departments. This can either be undertaken internally at low cost provided that management itself is well trained or by external consultants at a higher cost.

Frequent discussions of management with staff on environment issues and exchange of ideas among all the heads of the staff Employees become aware of the procedures followed in other departments.

For the preparation of staff manuals serve as guidelines to the staff (chemicals, waste, water, electricity etc). This can improve the effectiveness of the system and give an incentive to employees to take an active role in the implementation of the various environmental measures.

Information notices on the rational use of water, the rational use of high energy consumption devices, the rational use of chemicals, waste separation, "change-per-request" scheme for staff and guests should be provided. This can improve the effectiveness of the system and promote the environmental image of hotels.

To ensure early detection and avoidance of losses guests shall be invited to inform the staff of any leaks. This raises the environmental awareness of guests and improves their participation in other environmental actions.

Environmental certificates and awards shall be exposed in common areas. The environmental image of hotels is communicated to guests and visitors and they become aware of the hotel's environmental efforts and actions.

With the provision of environmental information (leaflets, booklets, environmental policy documents, magazines) in guest rooms the environmental image of hotels is communicated to guests and their participation in environmental actions is improved. [58]

All the hotels shall implement an environmental policy and employ an environmental officer.

6.2.1 Hotels in Jordan

Most of the hotels can increase their environmental score with little steps.

Energy management

With the installation of timers, dimmers, photo sensors and occupancy sensors to lighting systems in common indoor or outdoor areas the consumption of electricity can be reduced significantly with a short pay-back period. Installation costs are lower when provision for such systems is made during the design of buildings.

Significant electricity consumption reductions can be reached by the installation of automatic switch off system for air-conditioning when balcony doors or windows are open. Some systems shut off both water circulation and the fan, whereas others only stop water circulation. The former are more effective both in terms of direct electricity consumption but also because they alert guests about the activation of the system. The cost of installation is average and can be further reduced when provision for such systems is made at the design stage of new buildings.

Installations of solar water heating panels decrease the consumption of fuel or electricity for the operation of boilers. They can be used in combination with heat recovery chillers to meet the whole of demand for hot water in the summer. Purchase and installation cost is significant, however the pay-back period is short, especially with rising costs of fuel and electricity.

Natural cooling provided through the building architecture and/or the provision of shading through trees. Reduced demand for air-conditioning over the summer months with associated reductions in electricity.

Installation of double glazing windows provide thermal (reducing the losses of room heating or cooling) as well as acoustic insulation. The cost of installation is average, providing average pay-back periods. The cost is significantly lower when installed in new buildings rather than replacing single glazing windows in existing buildings. In the latter case gradual replacement based on a cost/benefit analysis can be applied.

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[58] Green-Tas; Evaluation of Alternative Environmental Systems

A central monitoring and control of the operation of a number of high energy consuming systems: air-conditioning systems, chillers, boilers, heaters, pumps, lighting etc. and allows for automatic halt of devices, which can be very useful when electricity demands approaches capacity. Its installation cost can be high.[59]

Water management

With the installation of water-saving toilet flushing systems the reduction in water consumption achieves to 3-6 litres per flushing depending upon the system selected. Systems with half/fill volume option are more appropriate for rooms, whereas reduced volume flushers and motion sensors are most suitable for public toilets and urinals respectively. The cost of such systems is generally low and the investment in such systems offers short pay-back periods.

The installation of water saving devices (aerators, single-handed lever water mixers, motion sensors, timers, pedals) in taps and showers gives a reduction to 6 litres per minute from 12-15 litres.

Tremendous reduction in the use of detergents, electricity and water consumption can be achieved by the application of the "change-per-request" scheme for linen and towels for guests. 50% typical reduction of laundry volume was reported in hotels. This action is suitable for implementation in all hotel categories and no cost is entailed, however, the scheme must be effectively communicated and justified to guests. This scheme has been introduced to many hotels worldwide, so many hotels guests are familiar with it.

Introduction of a water monitoring programme (frequent check for leaks, installation of consumption meters in key installations, frequent maintenance) can reduce water losses and identification of potential improvement areas. [60]

Waste management

For the reduction of packaging waste quantities the hotels shall use refillable beer and soft drink bottles and post-mix system.

The installation of refillable dispensers (soap in toilets, cleaning chemicals, detergents, jars for jams, honey, butter etc) lead to a reduction of waste quantities as well as cost because products in bulk quantities typically cost much less.

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[59] Green-Tas; Evaluation of Alternative Environmental Systems
[60] Green-Tas; Evaluation of Alternative Environmental Systems

The monitoring of waste quantities generated allows control of the volumes of waste produced and allows for identification of improvement opportunities. More effective if waste material streams are monitored separately in combination with a waste separation scheme.[61]

Reduction of the use of chemicals

The preparation of guidelines for the use of chemicals by staff (type per activity, dosage, health and safety precautions) achieves optimised use of chemicals and avoidance of excessive consumption as well as preventing accident hazards.

Important is the monitoring of quantities of chemicals consumed. This allows control of the volumes of chemicals consumed and allows for identification of improvement opportunities. This is even more effective if dosing devices are used.[62]

6.3   Marketing Aspects

With more than 87% of the guests coming from Arab countries or from Jordan the effect of environmental marketing is at a low level. Tour operators shall only choose hotels which have an environmental policy and employee an environmental officer.

For the promotion of environmental hotel an environmental excellence award should be launched. This certification should be awarded to hotels that have made environmental improvements.

With the King Abdullah II Centre of Excellence there is a well-known instrument which can be used. They could launch a new environmental award for the private sector in general or the tourist sector in particularly. A first meeting was already hold to discuss how to develop the cleaner production recognition award to a King Abdullah II Award for Excellence.

The award could also be linked to the hotel category system. With a certification or the award you would get a "plus". An awarded five star hotel would then be a five star "plus" hotel.

6.4   Costs and Consumption

Hotels are businesses aiming to maximise return for their owners, investors and shareholders. Thus, the cost and benefit parameters are possibly the most important factors when evaluating the implementation of environmental management systems and actions.

According to the lack of data available the hotels have to implement a monitoring system. To monitor the cost and consumptions in a first step the hotels have to implement a controlling system

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[61] Green-Tas; Evaluation of Alternative Environmental Systems

[62] Green-Tas; Evaluation of Alternative Environmental Systems

which allows the comparisment the consumption over certain periods. In a second step they can analyse the data to see the room for improvement.

Before this, benchmarking makes no sense. So far only the five star hotels can be compared.

7 Outlook

The environmental awareness in Jordan is slowly rising. Most of the tourists come from other Arab countries and their knowledge about protecting the environment is at a low level.

The hotels can be one part of the change. With actions for the environment and good communication they can achieve improved awareness of guests and employees.

With the launch of an environmental award and the implementation of a Jordan EMS the government can, at little cost, improve the environmental performance of the tourism sector.

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Appendix

Green-Tas Project

Objectives

The general objective is to understand environmental performance in the tourist accommodation sector in Jordan. More specifically the project aims at accomplishing the following objectives:

- Determination of the environmental problems that are related to the hotel accommodation service
- Understanding of the environmental management practices and polices
- Understand tourists, hotels, and tourists agents attitudes behaviours and willingness toward the environment

Methodology

Three questionnaires were designed to collect data via face to face interview with three targeted groups:

- Tourists
- Hotels administrations
- Tour operators

The survey is limited to the classified hotels only. Three questionnaires were designed to meet the project objectives of understanding environmental performance in the tourist accommodation sector in Jordan.

Tourists

The first questionnaire is designed to measure tourists' attitudes, behaviours and willingness toward the environment. The questionnaire consists of three sections:

Section one:

consists of a consent letter which clarifies the main objective and asserts the confidentiality and anonymity of the respondents in the survey.

Section two:

Consists of several questions and items that measure attitudes, behaviours and willingness toward the environment. The introductory questions were designed to be general questions. However, other specific questions and items were designed to address particular issues such as:

- Air quality, energy consumption, recycling, recycled wastewater, and light system in the hotel
- Accept certain measures and procedures that could be adopted by hotels to meet the requirements of good environmental performance

The respondents were asked to answer the designed questions to determine their opinions, habits and willingness toward the environment.

Section three:

The respondents were asked some socio-demographic questions in order to help understanding the variables that explain differences in respondents' answers. The questions are: gender, age, level of education, income, and country of origin.

Hotels

The second questionnaire is designed to measure hotels' environmental practices and knowledge.

Section one:

The consent letter which clarifies the main objective and asserts the confidentiality and anonymity of the respondents in the survey.

Second section:

Consists of 10 questions. These questions will help in analyzing the hotels' environmental performance. The questions are: The hotel classification, Affiliation (chain), operation date, maximum occupancy, total a Area, built up area, no. of rooms, and no. of beds.

Section three:

Consists of several questions that measure current environmental practices, willingness to adopt environmental programmes, awareness of environmental issues and initiatives, and willingness to change some current practices related to energy sources, consumption, wastewater recycling, light system, and air quality.

Tour operators

The third questionnaire is designed to identify and understand tour operator's attitudes and behaviours toward hotels environmental performance.

Section one:

The consent letter which clarifies the main objective and asserts the confidentiality and anonymity of the respondents in the survey.

Second section:

Consists of 4 questions. These questions will help in analyzing agents' attitudes, behaviours and evaluation of hotels environmental performance. The questions are: position of the person filling in the questionnaire, no. of trips arranged during the year, no. of hotels that the agent deals with, and no. of employees.

Section three:

Consists of several questions that measure concerns toward the environment, attitudes toward

certain environmental issues or problems, opinion about hotels environmental performance, awareness of environmental issues and initiatives, and behaviours (providing tourists with information regarding the environment, provide tourists with information with regard to some environmental behaviours (save energy, water, recycling, and contracts with hotels).

3.2 Sample

Introduction

Sample design is important because the entire survey is built around the sample. This is further emphasized by the fact that most of those who evaluate research start with evaluating the sample. If the sample is correct, they proceed with the evaluation process. But, if it is found to be otherwise, they will conclude that the survey lacks objectivity and, therefore, does not deserve any further attention.

A sample is efficient if its level of accuracy is high and its cost is low. Designing a sample usually depends on the objectives of the survey, the required accuracy, the levels at which the findings will be reported, the time designated for tabulation of results, and the resources made available for implementing the survey. Hence, it is important for the sponsors of the survey to identify the accuracy and objectivity of these factors before initiating the design process; otherwise they will have to defray the expenses of the survey.

A stratified sample was drawn from all classified hotels distributed as following:

Tab. 7-1:   Hotel sample

Hotel classification	Number of hotels	Sample size	Completed
1	69	9	8
2	53	15	15
3	56	28	24
4	23	23	18
5	21	21	15

800 guests were the target sample to be interviewed. The response rate was 85% for the guests and 83.3% for the hotels. The guests were randomly selected to participate in the study and a total of 680 guests were interviewed. Five field interviewers were chosen to supervise the field work of 19 field interviewers (most of them students from the Hashemite University). All participants were trained for one day followed by a pilot study. The study was conducted between 10-17 August 2006.

Objectives of the Study and Levels of Publication

The main objective of this survey is to investigate environmental situation of the tourism facilities and the opinion of tour operators, hotel guests, and hotels administrations (managers) towards the environmental aspects. So this survey could be classified as an opinion survey.

This survey targeted three groups distributed as following:

- Tour operators
- Hotel managers
- Guests in the hotels.

Sampling frame

The frame of this sample is provided by the Ministry of Tourism and Antiquities. This frame contains the name, address and other information for each sampling unit (hotels and tour operators).

Stratification

The hotels divided into five strata by the classification of each hotel, this stratification provides homogeneity within each stratum. The frame divided into five strata as follow:

Tab. 7-2: Hotel frame

Hotel class (Stratum)	Number of hotels
Five stars	21
Four stars	24
Three stars	56
Two stars	56
One star	68
TOTAL	222

The domains and Accuracy

The results of the survey will be reported at the national level. This survey can also provide reliable data at each class of hotels.

Estimating Sample Size

To estimate the sample size, it is essential to estimate the number of sampling units in each stratum in the simple random sample, so that the expected coefficient of variation at the stratum level was kept at 5%, and around 2% for all strata for the main variables.

Sample allocation among strata

The hotel sample allocated among strata by proportional allocation by capacity of hotels in each stratum, this way will provide best allocation of the sample.

Estimation of sample size

The sample size was estimated to provide reliable data at stratum level. The expected cv% at the stratum level is less than 5% and around 2% at national level for the main variables, the estimated of sample size is 98 hotels which more than 45% of the frame. Due to the limited number of hotels in the frame, the sample fraction is correspondingly high which will provide high accuracy of the sample.

The guests' sample

The number of guests' sample drawn from each hotels is 8 persons, the sample covers different nationality stays in the hotels during the survey.

Method of sample selection

The sample hotels sample was selected in each stratum in a systematic way after ordering the hotels in each stratum by geographic site to ensure the even distribution of the sample.

The accuracy of the results

The results indicate high precision of the sample for most of the variables studied.[63]

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[63] Green-Tas project 2006