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Academy for Educational Development/Egypt

10th of Ramadan City ISO 14001 Environmental Management Survey

Final Report

By

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AED Senior Resarch Consultant

In collaboration with

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Mr. Maha Khallaf, PSU

MARCH 2001

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ACRONYMS

10R	10th of Ramadan Industrial City
AED	Academy for Educational Development
BOT	Board of Trustees
CDA	City Development Authority
CDECA	Central Department for Environmental Communication and Awareness
EE	Environmental education
EEAA	Egyptian Environmental Affairs Agency
EEC	Energy Efficiency Council
EEPP	Egypt Environmental Policy Program
EETP	Environmental Education and Training Program
EFNIC	Environmentally Friendly New Industrial Cities Program
EIA	Environmental Impact Assessment
ET	Environmental Training
IEMS	Integrated Environmental Management System
NEAP	National Environmental Action Plan
NGO	Non-governmental Organization
OEP	Organization for Energy Planning
OSP	Organizational Support Program
PSU	Program Support Unit
SMEA	State Ministry for Environmental Affairs
UNEP	United Nations Environment Program
UNESCO	United Nations Educational and Scientific Organization
USAID	United States Agency for International Development

BACKGROUND

INTRODUCTION

The Egyptian Environmental Policy Program (EEPP) is a joint program between the Government of the United States, acting through the U.S. Agency for International Development (USAID), and the Arab Republic of Egypt, acting through the Egyptian Environmental Affairs Agency (EEAA) of the Ministry of State for Environmental Affairs, the Ministry of Petroleum's Organization for Energy Planning (OEP), and the Ministry of Tourism's Tourism Development Authority (TDA). EEPP is a four-year program to support policy, regulatory, and institutional reforms that promote environmental quality and protect natural resources.

The EEEP program is focused on accomplishing 15 policy objectives. The survey research described here is requested to support policy objective # 9: "The Minister of State for Environmental Affairs (MSEA) and the Egyptian Environmental Affairs Agency (EEAA), in cooperation with industrial stakeholders and relevant Government of Egypt (GOE) entities, will develop pollution reduction strategies which will generate higher rates of compliance." During the first 18 months of EEPP activities under this objective are focused on assisting EEAA, in association with the 10th of Ramadan City Investors' Association and relevant stakeholders, to design and initiate implementation of the Integrated Environmental Management System (IEMS) for the 10th of Ramadan Industrial City.

The activities of the IEMS include the implementation of the ISO 14001 Preparatory Program. This program will be implemented with support of the Program Support Unit (PSU) of the EEPP. The ISO 14001 Preparatory Program is designed to be a streamlined approach to EMS adoption to stimulate growth in the local environmental consulting market and improve environmental performance in the 10th of Ramadan City. Before the actual ISO 14001 Preparatory Program implementation. the EEPP decided to enlist the help of the Academy for Educational Development (AED) to conduct a survey to measure the current awareness of industrial business owners at the 10th of Ramadan City about the Environment Management Systems and their predisposition to ISO 14000 certification.

PURPOSE OF THE SURVEY

EEPP/PSU decided to undertake a preliminary research survey of industries in the 10th of Ramadan to learn about their knowledge and attitudes towards environmental management, as well

as their current levels of predisposition for implementing an ISO certification program. The assessment and evaluation of the attitudes of the business leadership in the 10th of Ramadan industries was sought in order to facilitate the attainment of IEMS goals of improved environmental management within the context of the ISO 14001 Preparatory Program.

Survey Objectives

The objectives of the 10R survey research for EEPP/PSU were:

1. to assess the degree of present awareness about EMS among 10th of Ramadan City industries, provide a baseline measure of 10th of Ramadan (10R) manager's knowledge, attitudes, and practices concerning their environmental management systems,
2. to evaluate their willingness to participate in the ISO 14001 Preparatory Program,
3. to find out what are the barriers, obstacles, and incentives which could hinder or foster their implementation of an ISO 14001 EMS,
4. to identify the best communication methods to promote the development and adoption of EMS.

EEPP/PSU formulated a number of research questions in consultation with MSEA, EEAA, and after review of previous work and research already undertaken in this area:

1. Do you have an Environmental Management System?
2. Do you know about law # 4/1994?
3. Do you keep an Environmental Register?
4. Does your company consider ISO 14001 certification?
5. What would motivate your company to get the ISO Certificate?
6. What do you believe are your current obstacles to better environmental management?
7. Do you believe that environmental legislation is an important factor in driving your company for environmental compliance?
8. Who is your most likely source of information on laws governing your environmental activities?
9. What support mechanisms do you think Egyptian environmental entities should adopt to help you best?
10. What is the best way to communicate EMS information to your Company?

REPORT ORGANIZATION

This quantitative survey report is organized in five sections:

In the *first* section the executive summary provides a quick presentation of the main findings and essential indicators characteristic of industries in the 10th of Ramadan Industrial City.

The *second* and *third* sections present a background introduction to the survey, discuss the survey objectives, and describe the methodology and sample used in data collection.

The *fourth* section analyzes the findings and presents the data of the research survey with regard to the disposition of 10R managers to EMS/ISO 14001 implementation.

In the *final* section, the conclusion reviews the overall patterns and trends of responses to the questions posed at the beginning of the study. Recommendations are also listed proposing actions based on the survey findings.

The main purpose of this survey was to quickly assess the present EMS status among 10R industries and their initial predisposition to the ISO 14001. This survey is a preliminary effort to guide and assist in the orientation of the EEPP/PSU ISO 14001 Preparatory Program.

METHODOLOGY

CHRONOLOGY

This survey was initially intended to be a quick one (two months), but unfortunately due to circumstances beyond the control of PSU it was conducted between November 2000 and March 2001 in five phases.

The first phase was preparatory in nature and included the survey design, sampling design, and questionnaire development; this lasted less than three weeks (beginning 9th November 2000). Reviews of the survey by MSEA and translation of the questionnaire into Arabic followed (until 10th December 2000).

The second phase comprised field pretests, finalization of the questionnaire (undertaken on December 10th 2000), and sample selection. This phase lasted until December 22nd 2000, at which date the survey fieldwork staff (staff of 10th of Ramadan Higher Technological Institute) notified us that due to impending Xmas, New Year, and El Fitr holidays, they would recess until January 3rd 2001!

Data collection interviews were undertaken in the third phase beginning January 4th 2001, but due to the end of semester exams of 10R Higher Technological Institute, its staff completed data collection proceedings (which were anticipated to last no more than two weeks) by 25th February 2001.

The fourth phase included all aspects of data processing from data coding, entry, editing, verification, data searches and tabulation and lasted two weeks, until 11th March 2001.

The final phase of the survey involved data analysis and report preparation, which took almost 10 days.

Following is a detailed description of each of the survey activities.

SAMPLE STRUCTURE

SAMPLE SIZE

In determining the appropriate sample size for 10R, two major elements had to be accounted for in the sample frame: a) industry type, b) industrial facility employment size.

Because the industrial activities of 10R companies are distributed *unevenly* among 12 production sectors (see Appendix B), we decided that our sample had to be stratified. Furthermore, since MSEA had expressed special concern about industrial companies' attitudinal predisposition

to ISO 14001 by company employment size, we agreed to divide our population sample into 5 groups of companies by employment size: 0-10, 11-50, 51-100, 101-500, >500.

So in order to account for the disproportionate distribution of companies among the 12 different production types (sectors) and the 5 company group sizes present in 10R, we determined that a sample size of 110 cases (15% of the total industrial population) would be the representative size sample of the 704 industrial facilities there.

Because of the great heterogeneity in the production activities of the 10R companies we found difficulty in attaining equal random distribution of sample size in each of the five companies' group sizes in all 12 production sectors, which is why we had to settle for a disproportionate random sample. The basic rule of thumb we followed was to collect a minimum of 10% sample for each of the five company employment group sizes.

As several previous studies had shown difficulty in achieving acceptable response rates, frequently as low as 60%, thus leading to bias and reliability problems, we took appropriate measures to ensure that reliability and dependability would be met by the fieldwork research contractor. A total of 180 company names list was drawn in the expectation that this would yield 110 completed interviews, and we required from the fieldwork research contractor (10R Higher Technological Institute) to put in place fieldwork procedures that would achieve a response rate of at least 60%.

Sample Design

In the design of the sample for this survey, EEPP/PSU aimed to structure a design, which would serve as baseline for further attitudinal assessment in 10R environmental research work. After review of several databases available on 10R industries, we selected the MSEA database as our source of company listings. It listed 704 companies in the 10th of Ramadan Industrial City, and we should mention that there are additional numbers of over 300 facilities under construction there.

The sample was designed to permit analysis by type of products, as well as by company employment size -- a criterion that was deemed critical at the outset of the research survey. To achieve this goal, EEPP/PSU designed a multistage stratified probability sample of 10R companies.

First stage: The systematic list distribution of the total 10R facilities in a matrix format, among the 12 sectors of industrial production and the five employment size groups.

Second stage: The random selection of the required number of companies for each production sector by company employment size strata, (proportional to the number of companies in each

production sector), i.e. (15 – 25% of the total 10R companies list)

Third stage: A detailed list of 180 companies was thus provided to the fieldwork research contractor (10R Higher Technological Institute) to facilitate fieldwork application.

Fourth Stage: The geographical distribution of the list of companies by the fieldwork research contractor in preparation for fieldwork.

QUESTIONNAIRE DEVELOPMENT.

A single questionnaire containing 15 questions was developed collaboratively between AED, MSEA, and EEPP/PSU staff. The questionnaire was initially developed in English, and then subsequently translated to Arabic for fieldwork application.

The essential objective was to assess the knowledge and attitudes of 10R managers of manufacturing companies concerning environmental management, ISO 14001 certification, and media of environmental information dissemination.

The questionnaire was structured in 5 main sections seeking information on:

1) Environmental Management Systems Data
   - Environmental Management Systems Status
2) ISO Certification, incentives and obstacles to ISO 900/14001 certification
   - Potential consideration for ISO 14001 Certification
   - Role of Legislation in Environmental compliance
   - Knowledge about Law #4/1994
   - The environmental register
4) Media of Environmental Information Dissemination
   - Sources of Environmental Information for 10R companies
   - Collaborative Environmental Organizations
5) Suggestions for improving environmental performance

The questionnaire was pretested by applying it with 13 companies, 11 interviews were completed suggesting a response rate over 80%. Results of the pretest were used to modify and finalize the questionnaire.

A training kit, including a practical manual, was developed for the training of fieldwork staff in the application of the questions during the interviews.

FIELDWORK

A group of eight experienced male interviewers completed a one-day fieldwork training program on the 3rd of January 2001. The training program included:

- Two lectures on specific survey topics: the EMS/ISO 14001 program and the environment and EEAA,
- One sessions with visual aids on how to fill in the questionnaires
- How to conduct an interview

At the end of the training course, a total of 6 interviewers from were selected from 10R Higher Technological Institute staff to conduct the data collection, which was made up of semi structured interviews with a combination of open ended & closed ended questions.

Fieldwork began on January 4, 2001 and was completed on February 25, 2000. The six interviewers had a supervisor who was responsible for organizing the work and at the same time reviewing the questionnaires in the field to ensure completeness and consistency. The interviewers were responsible for making appointments for their interviews, which were conducted without, face to face at the companies' locations.

In addition to selecting only the most qualified interviewers, a number of quality control measures were implemented during fieldwork:

1. Close supervision of the interviewing team during the fieldwork.
2. The fieldwork coordinator as well as PSU office staff visited the team and performed spot checks on their work.
3. Throughout the fieldwork, close communications were maintained between the PSU office and fieldwork team.
4. The completed questionnaires were revised twice. The supervisor in the field reviewed the completed questionnaires and gave his comments directly to the interviewer(s). Supervisors sent completed questionnaires in from the field as soon as possible after completion, where PSU staff reviewed them.
5. The fieldwork coordinator and his staff telephoned 10% of the companies who had completed questionnaires in order to verify that they had actually been interviewed.

DATA PROCESSING

Completed questionnaires were sent from the field to the PSU office for registration. The questionnaires were reviewed and then coded for consistency and completeness by PSU computer staff. Data were entered using Microsoft Office Access program One hundred percent of the questionnaires were re-entered on the computer to verify the accuracy of data entry. Verification and consistency checks were done in order to be sure about the quality and accuracy of the data. Data analyses were performed using Access software.

SURVEY RESPONSE

A summary of the outcome of the fieldwork is presented in Table 1. which shows that a total of 123 companies were successfully interviewed out of a total of 167 attempted interviews with correct listings, yielding a response rate of almost 74%. This is an average response rate, which was anticipated at the outset, and reflects in part the replacement of 12 company listings from the original random sample with others known personally to the interviewers. It was also interesting to find out that about 25 companies (14%) had closed or moved out of 10R even though this list of companies is a fairly recent one; a fact which may be borne in mind in future 10R surveys.

TABLE 1. DISTRIBUTION OF 10R INDUSTRIAL COMPANIES SURVEY RESPONSE

	Total
List of Companies	180
Errors in sample list	25
Companies replaced on list	12
Attempted interviews	167
Not available	25
Refused participation	14
Completed	123
Response rate	74%
Discarded	13
N = Sample	110

We discarded 13 inadequate questionnaires because of suspected tampering and erroneous responses, which resulted in a sample (N=110) total of 110 acceptable interviews, exactly 15.5% of the actual companies population of 10R; a clearly reliable representation.

FINDINGS

BACKGROUND CHARACTERISTICS

The 10R sample was designed as a stratified self-weighted sample at the level of product sectors and company employment group size, so we allocated a number of interviews to each product manufacturing sector proportional to their weight by employment group size. The definition of product types used in this survey is in Appendix B.

Table 2. shows how 10R companies are distributed by product type and employment size in the 10th of Ramadan City. We noticed that engineering products companies form the largest group (almost 24% of 10R companies), along with chemicals and textiles companies. We decided to divide the electrical companies from the engineering sector and as they were found to constitute a distinct production sector by themselves. We also had to combine all textile companies together as it became impossible to distinguish between their manufacturing activities (dyeing and other textile activities), as we found very few companies engaged in the dyeing process exclusively.

The two largest group size companies –from the different types of products-- were 11-50 &101-500 workers (constituting respectively about 37% and 29% of the companies in 10R), we drew a proportionately larger segment of our sample from these two groups.

TABLE 2. DISTRIBUTION OF 10R INDUSTRIES BY PRODUCT SECTOR & EMPLOYMENT

Type of Industry	0 - 10 workers	11 - 50 workers	51-100 workers	101 - 500 workers	> 500 workers	TOTAL	%
1. Ceramics and Glass	1	4	3	7	3	18	2.5
2. Chemical industries	22	63	21	46	4	156	22.1
3. Construction, Equipment & Materials	3	10	4	4	2	23	3.2
4. Engineering	22	63	35	43	4	167	23.7
5. Food Processing	6	37	6	25	7	81	11.5
6. Leather products		8	2	1		11	1.5
7. Medical industries		1	4	3		8	1.1
8. Metal Industries	9	14	11	17		51	7.2
9. Paper Industry	4	12	6	13		35	5
10. Textiles, Dying House		3	7	13	6	29	4.1
11. Textiles, Others	12	31	21	31	7	102	14.5
12. Wood Industry	1	16	2	4		23	3.2
Total	80	262	122	207	33	704	

%	11.3	37.2	17.3	29.5	4.7		100%

Our concern while drawing the 10R random stratified sample was to have a minimal proportional representation of at least 10% of the companies in each employment group size. The motivation behind this was to test the hypothesis of the potential correlation between company employment size and ISO 14001 certification. In Table 3., we find that Chemical companies, along with Food and Textiles constitute the largest employment size production sectors. 39% of our sample was drawn from the employment group size between 101-500 as 30% of 10R companies are from this group. The slight increase in proportional representation of this group is due to two factors: a better than average response rate in general, among managers of this group, and the replacement of about 10% of the randomly selected companies by the interviewers as they found difficulties in eliciting responses from managers of smaller size employment companies specifically.

TABLE 3. SURVEY SAMPLE DISTRIBUTION OF 10R INDUSTRIES BY PRODUCTION SECTOR & WORKERS

Type of Industry	0 - 10 workers	11 - 50 workers	51-100 workers	101 - 500 workers	> 500 workers	TOTAL	%
1. Chemical Industries	2	2	0	4	0	8	7.3
2. Construction, Equipment & Materials	2	1	0	3	2	8	7.3
3. Electrical Industries	0	0	0	1	3	4	3.6
4. Engineering	3	4	3	9	1	20	18
5. Food Processing	1	4	1	5	1	12	11
6. Leather products	0	1	1	1	0	3	2.7
7. Medical	0	0	0	2	1	3	2.7
8. Metallurgy Industries	1	5	1	4	1	12	11
9. Paper Industry	0	3	0	4	0	7	6.4
10. Plastic Industry	1	0	1	2	0	4	3.6
11. Textiles & Dyeing	0	8	4	7	8	27	25
12. Wood Industry	0	0	0	1	1	2	1.8
Total	10	28	11	43	18	110	
%	9.1	25.5	10	39.1	16.4	100%	

ENVIRONMENTAL MANAGEMENT SYSTEM

The level of government environmental regulation has been increasing steadily over the past five years with the implementation of Law /1994, which regulates air, water, and soil pollution. In response, the 10th of Ramadan City has actively sought environmental cleanliness and has been labeled an environmentally friendly city as part of the Environmentally Friendly New Industrial Cities Program (EFNIC). To support EEPP communication activities, the questionnaire focused on finding out the established EMS and the use of the environmental register in 10R companies.

There are many reasons and many forms to EMS, but the fact of their presence in a company in whatever form is indicative of the level of environmental awareness and efforts by the management for remediation. It would also reveal their disposition to potential engagement in ISO/14001 certification.

Table 4. details the distribution of companies by size of employment and the presence of an EMS in the company along with the environmental register. A basic rule of thumb holds true: the larger the size of workers in a company the more likely are we to find an EMS in place, and to find an environmental register. But the response to Question # 102, which is open ended & prods further about the nature of the EMS in place yielded 74 responses (67% of N), and revealed that the

TABLE 4. EMS & ENVIRONMENTAL REGISTER SAMPLE

Company Group by Employee Size	N	Have EMS	%	Do Not Have EMS	Have Env. Register	%	Do not Have Env. Register
0 - 10 workers	10	1	10	9	3	30	7
11 - 50 workers	28	11	39	17	21	75	7
51-100 workers	11	8	73	3	11	100	0
101 - 500 workers	43	39	91	4	39	91	4
> 500 workers	18	15	83	3	16	89	2
Total	110	74	67	36	90	82	20

managers of small companies have little knowledge about what constitutes an EMS –only 10% of them replied as having an EMS! Most of the respondents in the small and medium sized companies gave answers to the effect that EMS is simply disposing of the company's refuse, without comprehending any systematization to the process. In spite of this about 67% of the sample declared having an EMS, and almost 82% professed having an environmental register. This holds hope for further environmental compliance.

It is very clear that there is a direct correlation between company workers size and the existence of some awareness about EMS, if not the presence of an EMS proper. In Table 4. the rate of presence of an EMS in the sample of 10R companies is about 10% for the smallest company employment group size, gradually increasing to 39% among 11-50 workers, then 72% among the 51-100 workers size, peaking at 92% among the 101-500 workers size, and holding to 83% in the largest company size. This in itself is a significant finding which proves the hypothesis about a direct correlation between company employment size and the establishment of EMS.

TABLE 5. 10R COMPANIES CORRELATION BETWEEN PRESENCE OF EMS & EXPORT ACTIVITY		
Companies with EMS & Export	47	43%
Companies with EMS & No Export	27	25%
Subtotal	*74*	*67%*
Companies with No EMS & Export	13	12%
Companies with No EMS & No Export	23	21%
Subtotal	*36*	*33%*
Total N	110	

Of all the companies that stated that they have some sort of EMS in place we found 47 of them (43%) engaged in export activities, and another 27 companies (25%) having an EMS but not exporting. The companies with no EMS –with or without exporting activity-- were fewer and represented about 33% of the total sample. These results are consistent with our anticipated hypothesis concerning the relationship between presence of EMS and export activity in that the number of companies possessing the highest degree of correlation make up the largest group in Table 5 whereas those with No EMS and No export activities are the smallest group.

In Table 6 we see the distribution of 10R companies that have an EMS by type of industry, the largest group being among the manufacturers of textiles and dyes (21%), followed by the engineering sector (17%). Even though the relevance of data in this table is limited for our purposes but we think it might be useful to further future research concerning 10R companies.

TABLE 6. EMS PRESENCE IN 10R COMPANIES DISTRIBUTED BY TYPE OF INDUSTRY

Type of Industry	1 – 10 workers	11 - 50 workers	51 – 100 workers	101 - 500 workers	> 500	N=74	%
1. Chemical Industries		2		3		5	6.7
2. Construction, Equipment & Materials	1			3	2	6	8.1
3. Electrical Equipment				1	3	4	5.4
4. Engineering		3	2	8		13	17.5
5. Food Processing		1	1	5	1	8	10.8
6. Leather products		1	1	1		3	4.0
7. Medical				2	1	3	4.0
8. Metal Industries		2	1	4	1	8	10.8
9. Paper Industry				4		4	5.4
10. Plastic Industry			1	1		2	2.7
11. Textiles & Dyeing		2	2	6	6	16	21.6
12. Wood Industry				1	1	2	12.7
Total EMS	1	11	8	39	15	74	

In addition to the previous results in terms of the distribution of companies that possess some EMS and/or an environmental register, it is worthy to turn our attention to Table 7, which was yielded from the responses to question # 103 concerning the obstacles in the way of establishment of EMS. Even though the number of respondents to this question were forty five managers (about 41% of the sample) they enabled us to categorize the perceived obstacles into three main segments: two relating to technical aspects, and one pertaining to financial considerations.

The responses containing technical perceptions to the problems of EMS were clearly grouped in two foci: almost all small sized companies expressed a sense of ignorance about environment in general, and EMS in particular, as their managers didn't see a need for EMS on the basis of the size of their companies (being small) or the perceived cleanliness of their product or materials (being considered as pollution free). But as the size of the company increases we find a homogeneous appeal in seeking more technical information. Here the reason for not implementing proper EMS is the professed lack of technical knowledge, which would serve as the basis for such an endeavor. Serious concern and honest efforts at environmental remediation are evidently present among managers of the 101+ workers category whose main complaint about EMS at that stage is the limitation in funds and the search for financial assistance. We should also mention that this is a genuine concern for the 101+ workers category because the size of their companies and/or their products is such that it is thought that environmental engagement must be costly at this scale.

TABLE 7. 10R COMPANIES STATED OBSTACLES

Company Size	N	Respondents	Obstacles		
			Technical		Financial
			A	B	
0 - 10 workers	10	7	4	4	2
11 - 50 workers	28	9	5	3	1
51-100 workers	11	3	1	1	1
101 - 500 workers	43	20	1	9	12
> 500 workers	18	6	---	1	5
Total	110	45	11	18	21
%	100	41%	10	16	19

* **Technical A** Signifies technical obstacles in the sense of lacking Environmental Awareness in general & not recognizing a need for environmental management
* **Technical B** Recognizes need for environmental management but lack information, education, or training.

ISO CERTIFICATION

In general the 10R survey sample revealed that a healthy 32% (35 companies) of the 10R managers interviewed acknowledged having already achieved an ISO certification; about 24% of those certified (26 companies) had completed an ISO 9000 and another 9 companies (about 8%) had achieved both an ISO 9000 & ISO 14001! But not a single case was encountered in the process of this survey that had only an ISO 14001.

We see in Table 8 that 28 out of the 35 companies that had achieved ISO certification were large companies with over 101 workers/company. The largest group of 10R ISO certified companies was the Engineering Industries sector, the rest divided fairly evenly between the other products sectors.

TABLE 8. 10R COMPANIES ISO CERTIFICATION BY COMPANY SIZE

	ISO Certified	Considering ISO	
1 - 10 workers	0	4	4%
11 - 50 workers	5	14	13%
51 - 100 workers	2	6	5%
101 - 500 workers	14	27	25%
> 500	14	8	7%
Total	35	59	54%

Only 17 managers –all of them from large companies (over 101 workers)-- responded to Question # 109 explaining the obstacles encountered in ISO certification. Surprisingly only two managers mentioned financial concerns as their main obstacle, whereas the rest of them voiced technical concerns (5 companies), workers' environmental awareness (5 companies) and structural, administrative, and workers' training difficulties.

TABLE 9. 10R COMPANIES ISO CONSIDERATION

	ISO Certified		Companies Considering ISO Certification				
	#	%	Year 2001	Year 2002	Later	Total	%
ISO 9000	26	24	0	1	9	10	9%
ISO 9000 & 14001	9	8	*2*	*3*	11	16	15%
ISO 1400	0	0	*7*	*5*	21	33	30%
Subtotal Potential ISO 14001			*9*	*8*	32	49	45%
Total ISO Certification	35	32	9	9	41	59	54%

The answer to questions about intentions of future ISO certification were in my opinion inaccurate as measured by my own experience in the pretest phase of the survey. We find for instance that 21 out of 33 avowed ISO 14001 seekers have expressed a desire to do so but at a later unspecified date even though there is not a single case of ISO 14001 *only* certification among 10R companies. This leapfrogging into ISO 14001 certification --before considering ISO 9000-- seems to us unlikely because we have further clarification to this in answers to questions 114 & 115 -- concerning the incentives and obstacles to ISO 14001 certification-- explaining to us the reasons for the concerns and motivations for their expressed ISO interests. In general the answers to these questions are invariably "bottom line" type answers seeking to maximize profits, whereas the managers who have achieved ISO 14001 certification maintain that it does not increase their sales and is not a necessary requirement for their export activities.

It seems more plausible that the concern of these managers would turn first to ISO 9000 before ISO 14001. Indeed we always found more environmental understanding and receptivity on the part

of managers who have accomplished prior ISO 9000 certification. The fact that the majority of the respondents have expressed an interest in ISO 14001 yet at the same time defer decision on this at a later date signifies that they must perceive some gains as an incentive to implementing this interest. The real focus of future ISO 14001 certification efforts should be directed to the 17 companies (numbers in italics in table 9) that expressed interest in ISO 14001 certification in the years 2001 and 2002 (their names are listed in Appendix C).

When asked what would motivate them to seek ISO certification, the managers cited workers' health and environmental compliance most often. Half of the twenty-six of the companies that had achieved ISO 9000 certification, mentioned exporting as an incentive to seek ISO 9000, the rest of the replies focused on quality management and performance development.

ENVIRONMENTAL LEGISLATION

This section of the survey focused on three elements of environmental compliance, Law # 4/1994, the environmental register, and environmental legislation. Three specific questions (#106, #107, #116,) were addressed respectively in order to gage a) knowledge about environmental Law # 4/1994, b) prevalent attitudes concerning environmental legislation, and c) to find out whether legislation could indeed be regarded as an incentive to motivate sound environmental behavior. Because we had no means to verify or check for the validity of these responses we had to accept them at face value as general indicators, even though one would naturally expect some response bias to questions about compliance with the law. Hence it is not surprising that most companies reported themselves to be fully compliant with Law # 4/1994.

Table 11 (survey question #106) shows the overall rate of knowledge about Law # 4 among 10th of Ramadan companies to be 91% (100 companies) of the total sample, with the highest rates being observed in the categories comprising 51 to 500 workers. The companies who had 51 – 100 workers had the highest degree of knowledge about Law # 4/1994, and it seems fairly safe to say that knowledge about

TABLE 11. 10R COMPANIES AWARENESS OF LAW #4/1994

	Recognize Law # 4/1994	N	%
1 - 10 workers	8	10	80
11 - 50 workers	25	28	89.2
51 - 100 workers	11	11	100
101 - 500 workers	40	43	93
> 500	16	18	88.8
Total	100	110	90.9

environmental law is in direct correlation to company size; the larger the company the more awareness about environmental law there seems to be.

The survey question #116 sought to gage the 10R managers' perceived assessment of the importance of environmental legislation as an important incentive to environmental compliance. The findings presented in Table 12 show clearly that 65% of the managers interviewed felt that legislation and laws in general are definitely incentives promoting environmental compliance. A further explanation of these answers was refined by question #117, which asked managers to elaborate on their replies to their perception of the importance of environmental legislation for compliance. The responses were almost identical in statistical terms to those of Question 106 about Law # 4/1994, but what was surprising was to find a large number of the respondents encouraging --and even demanding more legislation-- as a mean to effect behavioral changes among the companies that are obviously lax in their environmental behavior.

TABLE 12. DO YOU THINK THAT ENVIRONMENTAL LEGISLATION CONSTITUTES AN IMPORTANT INCENTIVE TOWARDS YOUR COMPANY'S ENVIRONMENTAL COMPLIANCE?

	Respondents	N	%
1 - 10 workers	5	10	50
11 - 50 workers	19	28	68
51 - 100 workers	7	10	64
101 - 500 workers	29	43	67
> 500	12	18	67
Total	72	110	65

ENVIRONMENTAL INFORMATION MEDIA

As a complement to the communication efforts undertaken in the process of administering the survey we have incorporated in the questionnaire three specific –and detailed—questions concerning what are perceived the best sources of environmental information to 10R companies, which media 10R managers would prefer to use to gather environmental information, what would be the best means to provide assistance managers of 10R in the area of environmental management? Each of these questions detailed several choices for the respondents and they were asked to select more than one answer in order to maximize the benefits from these answers, hence

the reason why the number of responses (N) in the following three tables is greater than the survey sample (n=110).

This section of the questionnaire allowed us to classify the responses according to the most favorable selections, and provided us with alternatives in terms of the options that could be used to foster solutions to the expressed environmental needs of 10R companies.

TABLE 13. WHO ARE YOUR ESSENTIAL SOURCES OF ENVIRONMENTAL INFORMATION?

	N=277	%
1- 10R Investors Association	47	16.9
2- 10th of Ramadan CDA	28	10.1
3- 10th of Ramadan BOT	11	3.9
4- EEAA	77	27.8
5- Ministry of Industry	18	6.5
6- Environmental Management Unit	11	3.9
7- Environmental NGOs	3	1.0
8- Donor Projects	9	3.2
9- Research Institutions	45	16.2
10- Industries Association	9	3.2
11- Environment Consultant Companies	16	5.7
12- Others	3	1.0

The overwhelming source of environmental information preference of the managers interviewed in 10R was the EEAA (27.8%), with the Investors Association coming as distant second (16.9), and research institutions following as third choice among 16.2% of the respondents – which may reflect a certain bias to the interviewers who are members of the 10R High Institute of technology. The ministry of Industry was the fourth preference with only 6.5% of the selections. We compiled in Appendix E a detailed tabulation of these preferred selections according to industrial sectors, but discovered that its numbers were not that useful since the number of respondents in many sectors could hardly be considered indicative or representative. It is appended only for your perusal, in case you may find some use for the data in it.

TABLE 14. WHAT IS THE BEST WAY TO COMMUNICATE EMS INFORMATION TO YOUR COMPANY?

	N=329	%
1- E-mail	18	5.4
2- Regular mailings	67	20.3
3- Brochures	69	20.9
4- Videotapes	21	6.3
5- Posters	16	4.8
6- Industry networking events	14	4.3
7- 10th of Ramadan Internet Website	16	4.8
8- One – to – one meetings	16	4.8
9- Workshops	76	23.0
10- Environment Information Centers	16	4.8

Table 14 focused specifically on the types of media which 10R managers view as the most useful in terms of the different formats of environmental information they would like to receive. Three

leading channels of communication stood out among ten potential selections: workshops, brochures, and regular mailings.

We felt that workshops specifically (23.0%) may have been selected primarily because of the familiarity of most managers with this medium of information dissemination, and experience with its benefits. Brochures (20.9%) and regular mailings (20.3%) were about even in second place, reflecting a traditional pattern of information collection in the attitudes of the 10R managers.

It is however interesting to note that only very few of the respondents felt that high tech methods such as email, industry networking, website, or even environmental information centers, were plausible media which could be used to seek environmental information.

Table 15 shows the selections for the preferred environmental information dissemination tools to 10R companies. This information was sought to reflect a difference between it and the preceding Table 14, which probed the different media used to propagate environmental knowledge. In Table 15 we have a listing of the five most relevant techniques for conveying environmental information to 10R companies. Again we find workshops --as vehicles carrying knowledge this time—being the most favored (24.6%) with the second choice being almost equal among technical assistance (22%), and newsletters (21.7%). Some of the respondents qualified their choices by saying that workshops and technical assistance allowed them to discuss matters and voice opinions.

TABLE 15. WHAT SUPPORT MECHANISMS DO YOU THINK EGYPTIAN ENVIRONMENTAL ENTITIES SHOULD ADOPT TO HELP YOU REACH EFFECTIVE EMS?

	N=313	%
1- Workshops/ seminars	77	24.6
2- Books	37	11.8
3- Newsletters	68	21.7
4- Technical Assistance	69	22.0
5- Funding	62	19.8

Based on the data presented here we find an overwhelming consensus among 10R managers in receiving their environmental information directly from EEAA by means of workshops, or printed materials such as brochures or newsletters.

RESPONDENTS SUGGESTIONS

The last section in the survey included two questions in open-ended format seeking the suggestions of the managers interviewed about what would encourage them to improve their environmental management, and what they would consider the most appropriate action MSEA

could do to help their industry in the realm of environmental management. The responses to both questions were almost equal, 96 and 94 responses respectively.

Because of the great array of answers that were collected in response to each of the questions it was impossible to tabulate them accurately; instead we chose to present here the most recurrent and significant patterns we found among the diversity of responses.

We see from Table 16 that technical assistance was the action most sought by 10R respondent managers, but we have to explain that under this rubric a wide variety of technical types of assistance were collected. For instance providing environmental information, technical guidelines and supervision follow up, set up mailing lists for environmental newsletters, assist in hazardous waste management, etc.

TABLE 16. MSEA ACTION SOUGHT:

What one action or mechanism should the Minister of Environment do to assist your industry best in the field of environmental management?

	N=96	%
1- Technical Assistance	41	42.7
2- Legislative Action	19	19.8
3- Financial Assistance	16	16.6
4- Training	7	7.3
5- Workshops	7	7.3

Legislative actions vital to managers were also varied and disparate, but we had to gather the relevant responses in this same category; such as: to oversee the implementation of environmental laws, to simplify legislation (environmental), to follow up the application of legislations, to acquaint the companies with new legislation as it develops, etc...

It was surprising to find out that recommendations for financial assistance were not as numerous as legislative or technical assistance. It was explained to us by a manager that technical assistance could be worth "a lot of money" or "save us a lot of money".

As for answers to the last question in the survey (Question 122), they were found to be even more difficult to tabulate than the preceding question about MSEA action. The main reason behind this was that many of the managers gave specific answers regarding their company whereas others spoke in terms of generalities applicable to all of 10R. Some of the answers dealt explicitly with novel suggestions, such as to promote a reward (a cup or monetary recognition), or request the designation of a dump for solid waste management in 10R. But what was indeed significant in those answers was the emphasis on the necessity for compliance with Law # 4/1994 in order to encourage others to comply! Also the fact that in answer to this question we found the orientation of seeking technical assistance turning more toward seeking to increase environmental awareness, -both among workers and managers- rather than soliciting help from EEAA. The need for disseminating environmental awareness seems to be paramount in the minds of managers before the issue of proper environmental management could be addressed. Financial assistance was expressed at least as many times as environmental awareness but it took the guise of suggestions such as: asking MSEA to foot the bill for EMS, or ISO 14001 certification, or outright loans. Others still recommended that MSEA (or EEAA) should fund their water treatment plants, or hold workshops at no cost to the companies.

TABLE 17. HOW TO ENCOURAGE IMPROVING ENVIRONMENTAL MANAGEMENT:
What are your suggestions to encourage 10R companies to improve EMS in their companies?

	N=94	%
1- Legal Compliance	22	23
2- Improve Environmental Awareness	15	16
3- Financial Assistance	15	16
4- Training	9	9.5
5- Workshops	9	9.5

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

The objective of this study was to identify both the potential and target markets for EMS to help design communication interventions. Specifically, to assess the degree of actual awareness about EMS among 10R managers, and evaluate their willingness to participate in the ISO 14001 certification Preparatory Program. The survey succeeded in providing both PSU and AED with preliminary information about potential and target markets, as well as media of communications.

- About 45% of 10R companies potentially consider ISO 14001 certification, about 10% have stated they are considering so within two years. These companies would constitute the hardcore focus of the ISO 14001 Preparatory Program.
- 19% of the managers of 10R companies perceive financial constraints to be the prime obstacles to improving EMS and ISO certification, whereas 16% of them see the lack of technical assistance as a major obstacle.
- A relatively high number of 10R companies, 74%, have some an EMS in place, and 90% possess environmental registers.
- Almost 3 and a half times as much (43%) of the companies surveyed who have EMS also export as opposed to those companies which do not have EMS and export (12%).
- 65% of 10R managers feel that more environmental legislation is beneficial and they would encourage more environmental laws to be enacted.
- About 28% of respondents preferred EEAA as the source of their environmental information, with the preferred medium (23%) and format (25%) for environmental information communication being workshops.

This strongly suggests that to increase environmental awareness among the 10th of Ramadan companies is paramount to their increased involvement and willingness to participate in an ISO certification Program.

The data collected points to a number of possible interventions in which both AED and PSU could contribute to improve the establishment of EMS and ISO certification, and toward greater environmental compliance in 10R.

RECOMMENDATIONS

The survey has identified a number of activities that could potentially be addressed by AED and PSU through marketing and communication activities. Program decisions about which elements to include in a program, who should be the target audience, when, and how, are predicated by many factors, of which research is only the first one. Additional data should be gathered before launching any major environmental program activity aimed at such a large industrial city as the 10th of Ramadan. as this survey was a limited one with only the specific intent to find out the status of environmental awareness and predisposition of managers to the ISO certification Preparatory Program.

Communication Activities

Target Audience: Medium and large sized managers and policy makers, of 10R companies (100+ workers), particularly companies in the engineering, metallurgical, and textiles and dyeing industries.

Medium: EEAA as source of information using preferably a one to two days workshops.

Messages:

1. Investment in EMS enables companies to increase quality, productivity, health and cleanliness, while reducing costs.
2. ISO 14001 can contribute significantly to improve EMS, making for better environmental and workers protection.
3. ISO 14001 enhances a company's competitive abilities, export potential, and marketing image (prestige).
4. Compliance with Law # 4/1994 results in improved manageability, work conditions. and reduces waste of raw materials and assets.
5. Inform companies about the various aspects of Law # 4/1994 which applies to them. and

encourage them to seek full compliance as a major phase toward ISO 14001 certification.

6. Promote the concept of long range environmental planning among 10R companies and have them commit to planned phases according to an established time frame congruent with the ISO 14001 Preparatory Program.

Messages for policymakers:

1. Sustain the efforts and activities of 10R Investors Association, Board of Trustees, and activate the City Development Authority in adopting and implementing a multi-phased program of environmental compliance, leading to full ISO 14001 certification
2. Support the establishment of international environmental certification programs to enhance the environmental integrity of 10R and make it a model for other industrial cities to emulate.
3. Facilitate the dissemination of information about environmental compliance and certification through the periodic scheduling of a series of workshops geared to enlist a core number of participating companies for eventual ISO certification.
4. Establish a database of the essential players in the endeavor of ISO certification such as environmental consultant companies, certification authorities, environmental research institutions, and officials contact points.

Marketing Activities:

This survey has uncovered a number of activities which could be engaged in by AED to effect a number of marketing actions or policy measures.

1. Work closely with the 10R companies that have ISO 14001 certification intentions to tap into their predisposition to reach ISO certification.
2. Introduce and market the services provided by ISO 14001 certifying firms to increase the exposure of 10R companies to them
3. Promote and encourage commitment on the part of 10R companies by explaining the export benefits of ISO 14001 certification to them.
4. Assume partnership with willing 10R companies to fund their consultant fees in the initial

stages of ISO preparation.

5. Focus on priority sectors (the most polluting) to achieve higher levels of participation in those sectors, and broaden the target audience to include other sectors whenever success is firmly established.
6. Inform the 10R companies about the options and availability of technical information and services which could be provided for them, for environmental compliance and ISO certification.
7. Work closely with PSU to convey ISO 14001 certification program plans and market goals and objectives to 10R companies in a multistage approach implemented in a long range approach.

APPENDIX A. THE 10R SURVEY GROUP

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APPENDIX B. 10R QUESTIONNAIRE SURVEY

APPENDIX C: TYPE OF INDUSTRY CODES

- **Chemical Industry:** Rubber and synthetic rubber, plastic products, chemicals, pharmaceuticals, resins, agricultural chemicals, chemical products
- **Construction Materials:** Non-metallic minerals (stone, cement, gypsum, glass, refractory products)
- **Electrical Equipment:** Transformers, switches, and lighting equipment,
- **Engineering Equipment:** Electronic, radio equipment, measuring and testing equipment, cars, buses, trucks.
- **Food and Beverages**: Food, tobacco, and beverages
- **Leather Products:** Leathers, and skins
- **Medical Industries:** Medical equipment, hospital needs.
- **Metallurgical Industries:** Base metal products (iron, steel), metal products, (tanks, containers, filters, chains, etc.), pipes, gaskets, knives, scissors, tools.
- **Paper and Publishing:** Cellulose, paper, board, printing and publishing
- **Plastic Industries & Packaging:** Containers, parts, products
- **Textiles and Dyeing:** Textiles, clothing
- **Wood and Furniture:** Wood and cork products, furniture

APPENDIX D:

10R companies which have expressed an interest in ISO 14001 certification in year 2001 and 2002

APPENDIX E:

10R ISO distribution of companies by sector and workers size

10R Industries media preference by type of industry

Table 10 details the distribution of 10R ISO certification by products sector and company size. The Engineering industries sector constitutes the largest number of ISO certifications with 11 companies. The largest two company workers size groups (over 101+) have the most certifications with 14 companies in each group.

TABLE 10. 10R ISO DISTRIBUTION OF COMPANIES BY SECTOR AND WORKERS SIZE

Sector	1-10 workers		11-50 workers		51-100 workers		101-500 workers		>500 workers		Sub Totals		
	ISO No	**ISO Yes**	ISO No	**ISO Yes**	ISO No	**ISO Yes**	ISO No	**ISO Yes**	ISO No	**ISO Yes**	ISO No	**ISO Yes**	
Chemical Industries	2	0	1	1	0	0	3	1	0	0	6	2	8
Construction Material	2	0	1	0	0	0	3	0	0	2	6	2	8
Electricity Industries	0	0	0	0	0	0	1	0	0	3	1	3	4
Engineering Products	3	0	3	1	1	2	2	7	0	1	9	11	2
Food Industry	1	0	4	0	1	0	3	2	0	1	9	3	1
Leather & Leather Products	0	0	1	0	1	0	1	0	0	0	3	0	3
Medical & Pharmaceutical	0	0	0	0	0	0	2	0	0	1	2	1	3
Metallurgical Industries	1	0	3	2	1	0	3	1	0	1	8	4	1
Plastic & Packaging	1	0	0	0	1	0	1	1	0	0	3	1	-
Textile & Printing	0	0	7	1	4	0	7	0	4	4	22	5	2
Paper & Printing	0	0	3	0	0	0	2	2	0	0	5	2	7
Wood Industries	0	0	0	0	0	0	1	0	0	1	1	1	2
Total	10	0	23	5	9	2	29	14	4	14	75	35	1
%	9.1	0	20.9	4.5	8.2	1.8	26.4	12.7	3.6	12.7	68.2	31.8	

TABLE 18. DISTRIBUTION OF 10R INDUSTRIES FOR MEDIA PREFERENCE BY TYPE OF INDUSTRY

Type of Industry	N	1	2	3	4	5	6	7	8	9	10	11	12
Chemical Industries	8	3	1	1	6	0	1	0	0	2	0	1	0
Construction, Equipment & Materials	8	3	0	2	2	2	0	1	1	4	0	0	0
Electrical Industries	4	2	1	1	3	1	0	1	1	4	0	2	1
Engineering	20	11	6	2	16	4	3	0	2	7	3	2	0
Food Processing	12	5	2	1	7	1	1	0	0	7	0	3	1
Leather products	3	2	1	1	3	2	1	1	0	1	0	0	0
Medical	3	0	1	0	2	0	1	0	0	1	1	0	0
Metallurgy Industries	12	5	4	0	9	2	1	0	1	4	1	2	0
Paper Industry	7	4	2	0	6	0	0	0	1	2	0	1	1
Plastic Industry	4	1	1	0	1	1	0	0	0	1	0	0	0
Textiles & Dyeing	27	11	9	2	22	4	3	0	3	11	5	2	0
Wood Industry	2	0	0	0	0	1	0	0	1	1	1	1	0
Total	91												
%	83												

1- 10th of Ramadan Investors Association 2- 10th of Ramadan CDA 3- 10th of Ramadan BOT 4- EEAA
5- Ministry of Industry 6- Environmental Management Units 7- Environmental NGOs 8- Donor Projects
9- Research Institutions 10- Industries Association 11- Environment Consultant Companies 12- Others