



# Green Management and Sustainable Development: The Case of Kingdom of Bahrain

Arpita Dutta

*College of Administrative and Financial Sciences - AMA International University, Kingdom of Bahrain*

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**Abstract:** Sustainable Development has emerged as the most viable and practical model for human activity, that ensures the protection as well as progress of the three main stakeholders i.e., the economy, the ecology and the community and green technology is at the fore-front of this global movement towards “Sustainable Development”. It is particularly relevant in the case of the Kingdom of Bahrain. As the need for green products and services rise, partly mandated by governmental regulations, more and more entrepreneurs will jump into the green technology bandwagon and a positive cycle of new and more efficient green products will be created. Nowadays it is not just IT majors that are pumping in millions of dollars to focus on green technologies and environmental conservation, but also retailers and investment bankers have pooled resources to make their contribution. The main goal of this research is to understand the status and level of effectiveness of the implementation of Green Technology among the selected consultancy companies in the Kingdom of Bahrain. The study also uncovers the difference in perception about the status and the actual effectiveness in the implementation. The study was conducted using surveys questionnaires and personal interviews, with a respondents group selected from eight different organizations that are actively involved in Green Technology implementation in the Kingdom of Bahrain. The results showed that whilst respondents attached a high level of importance to the status of Green Technology, the level of effectiveness was gauged to be not very effective. Several problems and challenges were brought forth which are hampering the process of effective implementation of Green technology projects. The study confirmed the hypothesis that there was very less difference in the perception amongst the respondents pertaining to status and level and effectiveness of implementation of Green Technology among the selected companies in the Kingdom of Bahrain. The study put forward details of some of the recommendations made by the respondents, which included a need for greater governmental support, investment in indigenous research and development capabilities, creating public awareness and improving access to newer technologies in the field of Green technology.

**Keywords:** Green Technology, Sustainable Development, Economy, Ecology and the Community.

## Introduction

The idea of using Green Technology is central to the Sustainable Development initiative and it has its roots in the United Nations Conference on Human Environment (1972), in Stockholm, which highlighted the link between the environment and development in the Earths context. The World Commission on Environment and Development defined it in their publication ‘Our Common Future’ as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. For economic progress and environmental

conservation to go hand in hand, it requires a unifying and holistic factor to integrate the myriad interactive components into a functional whole, and that unifying factor can be the intensive application of Green Technology.

The Middle East is undergoing a heavy, multifaceted turmoil and crises, especially in the last few years. The rising oil prices may have come as a relief, but the financial crisis has left major industries in the region gasping for breath. This was further exacerbated by the fact that the region was betting on industries such as finance, investments, tourism and manufacturing etc., which were all affected



deeply. The Gulf States are beginning to pay closer attention to sustainable energy and other aspects which they feel will create long term stability, generate jobs and address the rising discontent and flagging economic growth in the region.

### **Green Technology is of vital importance to the Kingdom of Bahrain**

Bahrain as it holds the key for environmental conservation and the general safety and well being of all the residents of the Kingdom of Bahrain. From the main issues affecting Bahrain, we get an understanding of not just the challenges that need urgent remedies but we may also observe some major elements that are at the root of these problems, namely, energy and waste management. Access to clean, renewable and cheap sources of energy is one of the biggest requirements for this country. This problem has more to do with the mind-set of the people and their representatives that any logistical or technological gap that may exist.

### **Research Methodology**

#### **Sampling Design**

The study utilized purposive sampling as the company is very strict in giving out data. Purposive sampling was used to ensure that people who have expertise in the area of study were the only ones who will answer the questions and thereby give accurate responses. Purposive sampling, according to the SAGE Dictionary of Social Research Methods (Victor, 2006) is a form of sampling technique which is non probabilistic whereby the decision on who will be the respondents depends on the criteria set by the researcher. Criteria may include the degree of knowledge and expertise on the topic that is being researched.

The respondents were drawn from the following selected companies:

(a) Atkins is one of the world's leading design, and engineering and project management consultancies. They have been instrumental in the design, construction and implementation of some of the biggest Green Technology projects in the world. In the Kingdom of Bahrain, they are focused on

architecture, civil and structural engineering, MEP engineering, sustainable design and construction supervision.

(b) Smart Source Construction Solution WLL is a leading distributor and consultancy company for all environmentally friendly and Green Technology based construction materials. They specialize in undertaking projects that include intensive implementation of Green Technology.

(c) Quality Systems Techniques is a very well known International trading company specializing in international trade and distribution of Environmental systems and Construction Materials. Their product portfolio includes Green Technology materials and equipments that are supplied across the entire region.

(d) Agas Lubes is Agas Lubes provides solutions to protect the sensitive ecology of the Kingdom of Bahrain by setting up a refinery to re-process used lube oils generated in the country. Their new facility based on the latest technology uses 'thin wiped film evaporators' processes which use lubricating oils at much lower temperatures under high vacuum.

(e) Tebodin is a multidisciplinary consultancy and engineering firm which offers clients the knowledge and experience of approximately 4,300 experts in industry, health & nutrition, oil & gas, chemicals, infrastructure, property and energy & environment. Their services include consultancy, project management, design and engineering, procurement and construction management etc. In Bahrain they have executed several projects which include the implementation of Green Technology.

(f) Hyder Consulting Middle East is a multi-national design and engineering consultancy renowned for working on some of the world's most iconic buildings and structures including the Sydney Harbour Bridge, Tower Bridge in London and the world's tallest building, Burj Khalifa, in Dubai. They specialize in environmental management and protection where the financing, planning, implementation or management of large and small property developments or key utility, transport and service infrastructure projects are involved.



- (g) Environment Arabia Consultancy Services WLL –it provides environment and Green Technology related consultancy services to a diverse range of businesses and sectors across the Kingdom of Bahrain.
- (h) BMS – a leading company for advertising infrastructure in the Kingdom of Bahrain. The company manages and operates over

1100 outdoor medium locations across the country and is currently involved in the complete restructuring of its medium by introducing lit boards that capitalize on the Green Technology and eco-friendly concepts and techniques, in order to reduce the carbon footprint and to focus on environmentally friendly ways to do business.

**Table 1: Respondents Distribution**

| Designation / Work Profile |    |    |       |
|----------------------------|----|----|-------|
| Manager                    | 20 | 14 | 70%   |
| Engineer/Consultant        | 35 | 13 | 37.1% |
| Supervisor                 | 15 | 13 | 86.6% |
| Total                      | 70 | 40 | 57.1% |

### Research Instruments

In order to collect data for the study, the researcher made use of two research instruments, survey and personal interviews. The questionnaire consisted of four parts. Part A examined the existing status of the implementation of Green Technology by the identified companies in the Kingdom of Bahrain. Part B focused on the level of effectiveness of implementation of Green technology by the identified companies. In part 3 the various problems faced by the respondents in the implementation of Green Technology were answered. The final part of the questionnaire dealt with the recommendations and suggestions offered by the respondents to address the issues involved in the effective implementation of green technology in the respective organizations. Personal interviews were conducted with the relevant personnel as there are several aspects in the study that required access to personal and candid views and opinions about several aspects of the green technology business including governmental support, marketing challenges that are specific to the Kingdom of Bahrain and future trends and prospects of these technologies in the region. Likert numeric scales are attached to each question for finding out the qualitative data.

### Data Processing and Statistical Treatment

All the data acquired through the questionnaires was collected, organized, processed and analysed by the researcher, with the help of computer software-based statistical tools. The qualitative scales were assigned corresponding weights and the weighted mean of each item within the questionnaire was calculated. A hypothetical mean range was assigned to the scales for the purpose of attaining a definitive interpretation of each item.

The mean, t- test, N, standard deviation, mean difference, Sig(2 tailed) and the decision etc, were the tools used in statistical treatment of the study. SPSS was used to undertake statistical treatment of the collected data.

### Results and Discussions

Most respondents have a positive perception pertaining to Green Technology's contribution towards sustaining competitive advantage, increasing bottom-line profits, improving efficiency/productivity, expanding the market share and in improving the quality/sales/customer satisfaction levels. The data provided insights on the perception levels of the respondents and how they valued the importance of Green Technology for the



economic development aspect with a mean of 3.93. The contribution of Green Technology was considered to be important with a mean of 4.11 in its contribution towards sustaining competitive advantage. In some ways competitive advantage may be the accumulation of strengths in the areas of bottom-line profits, market share, quality of the products and services etc.

With a mean of 4.16, respondents hailed the role of Green Technology in its contribution to the ecological development. This was more than what they perceived as the contribution made to economic development. Most aspects of ecological development including reducing carbon footprint, reducing wastage, achieving organization's environmental goals, reducing nature-extracted raw materials and the improvement of the quality, safety and hygiene of the products offered by reducing toxic and chemical products etc were considered to be important. Clearly the respondents appreciate the fact that the environment is definitely the primary beneficiary when it came to Green technology.

The contribution of Green Technology towards the community development was also judged to be important. Respondents gave the lowest mean of 3.63 towards the aspect of organizations profits wherein it is able to make a more sustained and measurable effort towards contributing to the community. This could be because respondents did not see the connection between increase in profits and its proportionate increase in organization's contribution, in that it could be perceived that organizations are not driven purely by an increase in profits to take community and social initiatives.

From an economic development point of view, the respondents deemed the effectiveness of Green Technology concepts only somewhat effective with a composite mean of 3.32. This shows the near negative perception respondents hold towards the implementation of such technologies towards the economic development. As will shown later in this chapter, the respondents have substantiated this view for economic, ecological as well as community development aspect, by stating the various issue faced in the process of implementation

of Green Technologies. With a mean of 3.17, respondents felt that the level of effectiveness of the technologies that can make a positive impact on the organization's bottom-line profits was the lowest among all others.

The perception was equally unattractive for the ecological development perspective. Respondents gave consistently lower grades for what they felt was a lack lustre level of effectiveness in implementation of Green Technology projects that could benefit the ecological development. The lowest mean was attributed to the the implementation instances wherein Green Technologies would have allowed for the reduction in the usage and procurement of raw materials that is extracted directly from natural resources. None of the 5 points under ecological development possessed a mean of over 3.82.

Implementation of Green Technology concepts as a means to social and community development was found to be somewhat effective. The highest mean score was at 3.60 which is again a reflection of what the respondents felt previously about the status of Green technology, wherein it gave the organization the capacity and impetus to expand its community development objectives and activities.

Presented in Table 2 is the analysis on the perception of the respondents on the level of implementation of the Green Technology in the kingdom of Bahrain when grouped according to functions. Using F-test at .05 level of significance, it was found out that there is a comparable state of perception on the indicators set forth for this study: F-values of .476, 1.561 and .028, and p-values of .625, .223 and .973, respectively for economic development, ecological development and community development. This means that there is no significant difference on their perception. Hence, the null hypothesis of no significant difference on the perception of the respondents on the level of implementation on the Green Technology in the Kingdom of Bahrain is hereby accepted.



**Table 2: Level of effectiveness in the implementation of Green Technology among the selected companies when grouped according to their functions**

|                        |                | Sum of Squares | df | Mean Square | F     | Sig. |
|------------------------|----------------|----------------|----|-------------|-------|------|
| Economic Development   | Between Groups | .680           | 2  | .340        | .476  | .625 |
|                        | Within Groups  | 26.424         | 37 | .714        |       |      |
|                        | Total          | 27.104         | 39 |             |       |      |
| Ecological Development | Between Groups | 2.845          | 2  | 1.422       | 1.561 | .223 |
|                        | Within Groups  | 33.714         | 37 | .911        |       |      |
|                        | Total          | 36.559         | 39 |             |       |      |
| Community development  | Between Groups | .044           | 2  | .022        | .028  | .973 |
|                        | Within Groups  | 29.075         | 37 | .786        |       |      |
|                        | Total          | 29.119         | 39 |             |       |      |

**Table 3: Problems faced in the process of implementation of Green Technology among the selected companies in the Kingdom of Bahrain**

| Problems Encountered  | Frequency |
|---|-----------|
| Awareness levels need to improve amongst the General public, entrepreneurs, government officials etc. | 11        |
| Inadequate level of Governmental support to promote Green Technology.                                 | 6         |
| Cost factor in the implementation of Green Technology concepts.                                       | 14        |
| Access to latest technologies.  | 5         |
| Lack of adequate research and development in the Kingdom of Bahrain.                                  | 3         |
| Apathy and indifference on the part of people.  | 2         |

Cost Factor – Most respondents stated that the cost factor was the biggest hindrance in the implementation of Green Technology. Not only is the cost very high at the time of implementation, the returns on investments in the form of energy/cash savings are accrued over a considerable period of time, which makes it very difficult to justify the huge initial investment requirements.

Awareness Levels – The respondents felt that awareness about the basic concepts of Green Technology was lacking and this was prevalent amongst all members of society including the public, the businessmen, government officials etc. They felt that awareness levels should be increased at all arenas, including schools and colleges so that the younger generation may have a head start in Green Technology ideas.

Governmental Support – The support received was felt to be less than adequate. The respondents felt that policies and measures should be designed by the relevant ministries so that the implementation of Green Technology in the Kingdom of Bahrain may receive the much-needed boost. The lack of subsidies and related incentives is also adding to the cost factor as mentioned previously.

Access to Latest Technologies – There are major breakthroughs being made in the field of Green Technology and it is very important to be in touch with and to acquire the latest concepts and equipment. The respondents felt that they were not able to keep up with the new technologies being introduced periodically.

Lack of adequate research & development in the Kingdom of Bahrain - Most respondents felt that the Government,





Universities/educational institutions and private firms should pool their resources to encourage R&D activities in the country. Constantly sourcing new technologies from foreign countries is a very expensive exercise.

Apathy and indifference on the part of people. The respondents felt that people are yet to show genuine concern or interest in the need for implementation of Green Technology in the Kingdom of Bahrain.

### Conclusions

The study revealed several insightful details about the perception of the respondents with regards to the status of implementation of Green Technology in the Kingdom of Bahrain and also with regards to the level of effectiveness in the implementation of Green Technology among selected companies in the Kingdom of Bahrain.

- The study revealed the fact that whilst most respondents had an appreciation for the importance of Green Technology and the

potential it holds to make a positive impact on the economic, ecological and community development objectives, the current level of effectiveness of implementation of Green Technology was not up to their expectations.

- During personal interviews the respondents voiced concerns about the fact that certain fundamental issues existed, which, if not corrected immediately, the sustainable development concept can never be realized.

The fundamental issues basically related to issues such as lack of economic initiatives, industry benefits to promote Green Technology and the absence of a coherent government policy that promotes and strengthens a Green Technology-intensive industry.

As the economy diversifies it will be prudent to engage in sustainable development initiatives that ensure that the economy, ecology and community, the three important stakeholders, are protected and not at the cost of economic growth and economic expansion.

### Recommendations

**Table 4: Recommendations to improve the implementation of Green Technology in the Kingdom of Bahrain**

| Recommendations   | Frequency | Rank |
|---|-----------|------|
| Increase awareness levels                                 | 3         | 4    |
| Greater governmental support                              | 8         | 1    |
| Provide Subsidies or other measure to reduce costs        | 6         | 2    |
| Facilitate greater access to newer/latest technologies    | 2         | 5    |
| Invest in adequate research and development in this field | 4         | 3    |

### The respondents provided the following recommendations:

Greater Governmental Support. A lot more is expected out of the government departments in the Kingdom of Bahrain. As mentioned in the literature review section, many countries have taken committed measures to support industries and sectors that work towards the creation and implementation of Green Technologies. Most respondents expect the Bahrain's government to take the leadership for such initiatives in the country. Most respondents also suggested that the government should draw inspiration from

German and American policies and provide subsidies or other measure to reduce costs for importing, manufacturing and implementing Green Technologies in the Kingdom of Bahrain.

Investment in adequate research and development in the field of Green Technologies is the need of the hour. The kingdom of Bahrain must take steps to initiate extensive research and development activities to encourage indigenous creation of Green Technologies. It must increase awareness levels through training and industry out-reach programmes that educate and support the exchange and implementation of the latest



Green Technology solutions and Facilitate greater access to newer/latest technologies.

The study can be further enhanced by including manufacturing and construction companies.

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