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Survey Finding of Young People's Knowledge Attitudes & Behaviors on Environmental Issues: Water & Energy Conservation & Solid Waste Management. Informal & Non Formal Sectors. Final Report

Public Action for Water, Energy and Environment Project
Prosperity, Livelihoods and Conserving Ecosystems (PLACE) IQC Task Order #5

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PREFACE

The Public Action for Water, Energy and Environment Project (PAP) is a public education and behavior change communication program developed to support USAID's technical and policy investments in the Jordanian water and energy sectors, and to support specific initiatives in the environment, in particular with regard to solid waste. The project has been awarded to ECODIT, a US small business holding the Prosperity, Livelihoods and Conserving Ecosystems, or PLACE, Indefinite Quantity Contract with USAID.

PAP is a five years program that has been designed in three phases:

1. Data collection and assessment phase of 9 months ending July 31, 2010;
2. Participatory strategic planning phase of 3 months that will include dialogue with the relevant stakeholders; and
3. Implementation phase lasting about 4 years.

The first phase of the project (Assessment and Baseline Phase) is to be completed by the summer of 2010. As part of this phase, ECODIT is conducting numerous surveys, including 12 or more research efforts, and it is from the totality of these efforts that the project will determine its direction and focus for behavioral change. ECODIT has divided this phase into the several rapid assessments. In addition to this survey of Young People's Knowledge Attitudes and Behaviors on Environmental Issues: Water and Energy Conservation and Solid Waste Management. In the informal and non formal sectors which was prepared by world of letters, other surveys of Water and Energy Related Interviews for Large Jordanian Consumers, KAP household, donors, NGOs/CBOs, commercial outlets, governmental institutions including ministries, municipalities and utilities, and educational programs are on-going.

This study designed to explore the level of knowledge, attitudes held, and practices observed by young people towards environmental issues related to water and energy conservation and solid waste management. Equally it was vital to map out available resources, programs and learning opportunities in the informal and non-formal education sectors, through which positive environmental attitudes can be encouraged and promoted. The research instruments used to carry out these objectives were varied and designed to examine perspectives of different groups separately, yet maintaining a holistic approach towards the research issues. The instruments were also validated by environmental and sociological professionals, and pre-tested thoroughly.

The objectives of the project as relevant to this survey and outlined by the Public Action for Water, Energy and Environment Project are to develop young people's knowledge around the scarcity and limitations of resources; encourage individual action that can contribute to conservation of these resources; and educate young people on how science and technology can provide alternatives to improve consumption patterns. To address these objectives this survey has focused on assessing young people's current awareness of water and energy resources and waste reduction, and evaluating available learning resources which may serve as influential channels in young people's lives. The survey inquiry can be summarized in three key components:

1) Assess the knowledge, attitudes and practices of young people aged 7-24 to create baseline data.

2) Assess knowledge and attitudes of educators, staff, and youth workers to identify strengths and areas for improvement through capacity building.

Explore existing resources, programs, mediums and their effectiveness; and identify their appropriateness as platforms from which to further develop suitable interventions.

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EXECUTIVE SUMMARY

Environmental education is not limited to formal learning opportunities. There is still a need to develop a more holistic approach towards education and contextualize learning more meaningfully through linking learning experiences to real life local situations. Thus, the idea of non-formal and the in-formal curricula (hidden curriculum) was developed. The informal and non-formal education sectors have a large role to play in providing experiences and learning opportunities that complement and enhance formal education programs, especially those geared towards promoting positive attitudes and practices.

The objective of this study was to explore the level of knowledge, attitudes held, and practices observed by young people towards environmental issues related to water and energy conservation and solid waste management. Equally it was vital to map out available resources, programs and learning opportunities in the informal and non-formal education sectors, through which positive environmental attitudes can be encouraged and promoted. The research instruments used to carry out these objectives were varied and designed to examine perspectives of different groups separately, yet maintaining a holistic approach towards the research issues. The instruments were also validated by environmental and sociological professionals, and pre-tested thoroughly.

Although the survey included diverse groups and organizations, and findings revealed some variation in outlook; the underlying message was one: that young people who learned about the environment through experience and participation, developed a more positive attitude toward the environment and were more likely to behave in an environmentally responsible manner. The research was built on this assumption and explores factors contributing to this enhanced awareness.

Throughout the survey, it was evident that where some emphasis was given to participatory and experiential learning, young people's knowledge, attitudes and practices towards environmental issues were found to be greatly modified. Consequently education cannot be limited to classroom and laboratory settings, and needs to expand to encourage a sense of responsibility and service in the daily experiences of young people. Informal and non-formal settings if successfully developed can achieve this and instill in young people a more lasting impression of learning experiences, while assisting them gradually into becoming environmentally literate citizens.

The research essentially provides qualitative data emphasizing the human element with regards to environmental issues- people's beliefs, opinions, behaviors and emotions towards protecting the environment. For this reason the report will mainly provide literal readings of interview and focus group discussions to reveal how people understand and/or experience environmental issues and practices related to water and energy conservation, and solid waste management- within their own contextual reality. It will also include interpretive and reflexive descriptions of the findings to make sense of youth responses and explore recurring themes that can be further addressed. The report will also reveal differences in knowledge, attitudes and behaviors towards the environmental themes concerned, by looking at variation and/or relationships between factors such as age, gender, socioeconomic background and unemployment.

To distinguish between these individuals and groups the report is divided into separate chapters dedicated to youth perspectives independently, followed by a chapter on existing institutional resources and contributions; and subsequently providing an overview of identifiable gaps. These components can be summarized as the following:

A) Youth perspectives- which include an analysis of young people's knowledge, attitudes and practices based on factors such as socio-economic background, age, gender and unemployment.
B) Resources: such as sources of information, or available opportunities for young people to participate in and learn about local environmental issues.
C) Identified Gaps: which will include gaps in young people's knowledge, and quality and extent of resources and opportunities available to them.

Through these three key components the study has looked at best practices and developed a set of recommendations based on the research findings. The recommendations were developed keeping in mind current attitudes and practices amongst young people, and existing resources which can be further promoted to engage youth in meaningful learning, and impact their environmental awareness and ethical responsibility.

1.0 INTRODUCTION

1.1 Project Background and Objectives

The objectives of the project as relevant to this survey and outlined by the Public Action for Water, Energy and Environment Project are to develop young people's knowledge around the scarcity and limitations of resources; encourage individual action that can contribute to conservation of these resources; and educate young people on how science and technology can provide alternatives to improve consumption patterns. To address these objectives this survey has focused on assessing young people's current awareness of water and energy resources and waste reduction, and evaluating available learning resources which may serve as influential channels in young people's lives. The survey inquiry can be summarized in three key components:

3) Assess the knowledge, attitudes and practices of young people aged 7-24 to create baseline data.

4) Assess knowledge and attitudes of educators, staff, and youth workers to identify strengths and areas for improvement through capacity building.

5) Explore existing resources, programs, mediums and their effectiveness; and identify their appropriateness as platforms from which to further develop suitable interventions.

Due to its broad experience in developing interactive Arabic curricula and environmental education materials, the World of Letters (WoL) was contracted to implement this survey and provide an informed overview of current practices and youth perspectives. WoL Team has also contributed to the development of the WEPIA curriculum project and produced the first e-learning material for the Ministry of Education.

In light of this, the World of Letters has provided technical support in designing and revising all survey instruments relevant to the Informal and Non-formal education sectors in Jordan; conducting pre-testing of questionnaires to ensure their reliability; and implementing all survey instruments with young people, staff and educators as outlined by the Public Action for Water, Energy and Environment Project. This report will provide a succinct summary of the findings of the survey and outline recommendations for moving forward based on these.

1.2 Research Methodology

Sampling note

The survey sample of 145 included youth chosen on the basis of socioeconomic background though the participants also differed in age, gender, area of residence, and employment status in order to be representative of the population between ages 17 and 24.

For the purposes of this survey, participants were divided into the following for groups based on their reported household income:

Underprivileged and Deprived Communities	<300JD
Lower Socioeconomic Class	300-500JD
Lower-Middle Socioeconomic Class	500-1000JD
Upper and Middle Socioeconomic Classes	>1000JD

Note: *This division of income groups uses a different income amount from the "Absolute Poverty Line" used in Jordan, which is set at 566JD per year for an individual. However, the division above still captures the stratification of income groups in Jordan.*

Participants were recruited from areas youth normally congregate as well as in partnership with social clubs, sports clubs, and other organizations that work with youth. Of the 145 youth, 62 were female and 83 were male. The survey also included children aged 7-10 attending non-formal education centers like the Children's Museum and Haya Cultural Center. This report includes case studies of these spaces to review their impact on young people's environmental knowledge.

The survey also includes interviews with individuals working with youth at 8 different organizations. These eight organizations in addition to six retail establishments were visited and reviewed according to their impact on youth environmental knowledge. Information from these meetings would shed light on learning opportunities available to young people, their effectiveness, and improvements needed to ensure the continuity and success of such programs.

Note: A more detailed table showing a breakdown of the key demographic groups in the responding sample is included in ***Appendix 1****. A complete contact's list of key interviewees within each organization, and youth with whom we conducted in-depth interview is also included as (****Appendix 2****).*

Methodological note

The field survey was conducted between December 19th 2009 and February 15th 2010. The survey responses were retrieved through the use of youth focus groups, semi-structured interviews, and in-depth one-on-one or telephone interviews.

Focus group discussions provided the most data to asses general trends amongst youths of varying backgrounds. Each organized session included 8-10 participants, and 3-5 persons in informal settings. Some semi-structured interviews were also carried out in these spaces. Each session and meeting was recorded with an audio-recording device. The focus group sessions began with the group choosing the most pressing concern from a list of social issues and then transitioned to discussing the environment. Sessions included general questions about environmental concepts as well as more specific questions relevant to Jordan's experience and to the three themes of this study. Participants were also asked to respond to attitudinal and behavioral statements related to the themes of this survey and discuss their thoughts on each statement.

Telephone interviews were also carried out with 26 active youth to further investigate sources of knowledge and motivation for participation in environmental activity. Where some young people were found to be more knowledgeable within focus groups and more actively responsible towards the environment, these youths were interviewed in more depth to identify gaps between them and their peers and to discover what sources of information, opportunities and experiences may have facilitated a more developed awareness, sense of responsibility and set of practices.

Finally, World of Letters staff conducted field visits at various organizations and interviewed key program staff and directors to explore the existing resources and programs targeting youth and to identify opportunities that may contribute to developing positive environmental ethics. The field survey was conducted between December 19th 2009 and February 15th 2010. The survey responses were retrieved through the use of youth focus groups, semi-structured interviews, and in-depth one-on-one or telephone interviews.

Field survey included:

- 6 organized FGs with unemployed/employed youths both male and female,
- 5 focus groups for young people from a variety of sports clubs and public spaces
- over 10 semi-structured interviews with youths in public spaces
- In-depth telephone interviews were carried out with 16 young people found to be active in environmental activities.
- Over 10 in-depth one on one interviews were carried out with staff, educators and program directors at various institutions and telephone interviews. The questionnaires used are included as annexes to this report.

Note: ***Appendix 3*** *presents a summary and breakdown of the field work sessions.*

2.0 KEY FINDINGS

The survey process revealed a variety of key findings which may serve as indicators to where priority should be given and what initiatives can be launched to kick-start a changing environmental culture. The set of recommendations detailed in the final section of the report has also been developed based on these key findings and can provide important insight and inform the Public Action for Water, Energy and Environment Project's initiation. The most striking findings were found to be the following:

❖ Most young people included in the survey felt that there was a lack of clear and concise information about Jordan's environmental challenges, although they had varied knowledge about environmental issues elsewhere in the world. For them the most useful sources of information and learning are hands-on experiences, Satellite television, and the internet.

❖ Noticeable barriers to young people's involvement included a perceived lack of opportunity to participate in relevant activities. When asked what activities would be most valuable to initiating a change, most respondents stated that participatory and hands-on programs would develop their awareness and affect their practices.

❖ Young people who have actively participated in environmental activities, had a better understanding of practical issues of conservation and protection, and showed more concern for holistic environmental issues.

❖ Most young people believe they currently practice positive water and energy conservation, even when they didn't, however motivations towards these behaviors were mostly extrinsic based on economic reasons or lack of availability. Few youths surveyed felt a responsibility towards protecting the environment through conservation.

❖ Very few youth understood that Jordan is one of the poorest countries in the world with regards to water rations per capita. When asked what they felt they would do to conserve water, most identified simplistic ways of conservation.

❖ Most youth showed adequate knowledge of energy sources. However, their knowledge of sources of energy for Jordan and resource scarcity was limited. Energy conservation practices were also basic, though motivations for behavior were extrinsic stemming from parental and financial pressures.

❖ Most youth were aware of the types of solid waste and the collection mechanisms, however most were unaware of concepts of reducing and re-using. Practices revealed that they were not necessarily concerned as they felt it was the government's role to ensure facilities are available, however anti-littering values were expressed by many.

❖ Most young people interviewed indicated that if facilities, services or alternatives were available, they would participate actively in positive environmental practices, such as recycling and re-using.

❖ Females generally seemed to prioritize the environment more so than males, yet one in every two youths interviewed prioritized finding employment over protecting the environment. Females' attitudes towards the environment however reflected a greater concern and emotional connection to issues.

❖ All young people surveyed believed the government has an essential role to play in providing alternatives to improve consumption patterns. Nearly half of those felt it was also important for them as individuals to do something about conservation.

❖ Programs and resources were found to be limited in terms of accessibility and outreach.

3.0 YOUTH PERSPECTIVES IN THE INFORMAL AND NON-FORMAL SECTORS

This chapter summarizes the findings of the survey with youth aged 17 to 24, identifying the extent of general knowledge and attitudes around water, energy, and solid waste. The findings also explore the extent to which youth care about the environment; they believe they have a role in protecting the environment, and their willingness to change their current behaviors to be more environmentally friendly if needed. The trends among youth, according to their socioeconomic backgrounds, gender, employment, age, and other variables, will also be discussed. The final portion of the chapter, Section 3.2, includes a review of the Children's Museum as well as the Haya Cultural Center to identify the impact each has on the children that visit.

3.1 Informal and Non-formal Sector

Underprivileged and Deprived Communities

When asked what environmental problems they were generally aware of, most respondents from underprivileged and deprived communities mentioned air pollution and increased littering in parks and public spaces.

Awareness of the three particular survey themes was varied and minimal. The most prominent and relevant theme to this group was water scarcity, however this seemed to originate from experiencing water shortages at home and familiarity with their communities' discussions around this. Youth in this group believed that this was a supply problem and government-driven rather than a demand problem.

Although their behaviors included some conservation practices, this did not stem from a sense of responsibility towards the environment, but rather knowledge that water was scarce on most days and so to conserve for future days was a necessity rather than a will. Their motivation for saving was an extrinsic one originating from lack of availability rather than a deeper understanding of the scarcity of water as a natural resource globally.

Their attitudes towards water conservation revealed a sense of injustice that they felt about the government's water distribution. Many identified water pollution as a problem also, mentioning that their families had been supplied with water that was brown in color and smelled of sewage. Several of the respondents felt that their communities were more visibly neglected while other communities in West Amman received superior and more frequent services. They expressed a feeling of inequality regarding their rights to existing resources, that inevitably they were forced to consume less, whilst others were allowed to consume more. This was seen as an inadequacy in the government taking its role seriously, and so attitudes towards the government were quite negative in this group. Additionally when asked whether the government should raise the water bill in order to force conservation, they opposed heavily and felt further injustice.

Awareness around energy issues was negligible in this group. Some identified alternative energy sources however did not see the relevance of conservation, mentioning that electricity was not a national problem, and that it was abundant. This reveals a lack of understanding of the association between electricity production and its main source of generation: oil or fuel.

This group also sensed it was the government's role to provide energy to its citizens, rather than the citizen's duty to take an active role in conserving. However their practices revealed mindful energy conservation at home to some degree, although when asked about their motivation for this, most respondents mentioned it was necessary for financial reasons.

Solid waste issues were mostly associated with littering, however concepts of reducing, re-using and recycling waste were absent in the discussion. When asked specifically about solid waste management and recycling, most had a basic idea of the concept. Knowledge of this was acquired through television programs mostly, however they felt it had little relevance to Jordan and felt unwilling to participate in such activities. They perceived that their neighborhoods would remain unclean and polluted due to trash bins being scarce and lack of regulation by the government for waste collection in those neighborhoods. So they felt individuals were forced to litter.

The most considerable sources of information for this group were either their formal education experiences or satellite television. It was clear there was a marked difference in knowledge between younger youths in this population group and their older peers, who had dropped out of school. Those younger had remembered considerably more information that had been acquired through formal education, whereas their older peers remember learning some concepts at school, but found no relevance to these in their daily life and so disregarded the information. This group of youths generally felt apathetic towards environmental issues, expressing that unemployment was a bigger priority for them than environmental problems, which they felt were generally trivial concerns in light of what they perceived as their unfortunate circumstances. They perceived the environment to be a priority for the upper classes, as those wealthier had the luxury to feel passionate or responsible about environmental issues, while they sensed they had bigger social problems to concern themselves with.
Very few of the youth respondents in this group related to our questions but rather responded with what they felt was a more vital concern for us to convey about their communities.

Lower Socioeconomic Class

Generally most youth in this background seemed to be considerably more aware than their peers from deprived communities, but also revealed a more developed awareness than some of their peers from higher socioeconomic backgrounds. This group was also relatively more aware than all their peers in lower socioeconomic backgrounds and most of their peers in lower-middle socioeconomic backgrounds. The source of this knowledge seemed to stem mostly from experiencing particular environmental challenges in their own communities, but was also acquired from various sources such as television.

Generally this group had a depth of knowledge about global environmental problems such as climatic change, deforestation, and desertification and air pollution. They felt that the most important environmental problem in Jordan is air pollution from factories and solid waste disposal, mainly littering.

When further challenged the youth identified water pollution and scarcity as a problem in Jordan as well. They identified with water problems to a higher degree than any other locally relevant environmental problems, identifying sources such as surface water, and recognizing that the Jordan River is the surface water source in Jordan. They also mentioned the importance of ground water resources, as well as understanding existing problems of water pollution referring to the Zarqa River and the various pollutants it receives from the industries located along the river. It seemed this knowledge also stemmed from personal experience.

Knowledge around energy sources was equally vast, as they could identify renewable and non-renewable sources including solar, hydro-power, tidal, wind and nuclear energy. Yet very few could associate that oil was the main source of energy used in generating electricity for Jordan. Generally attitudes towards energy conservation were found to be more positive than water, however this sense of responsibility originated from religious beliefs that wastefulness was sinful behavior. Attitudes towards energy conservation were also high, as excessive use was also tied to ethical feelings stemming from religious beliefs, yet it seemed practices were influenced more so by financial constraints than ethical responsibility.

They also felt that they used little water anyway as supply by the government was intermittent and so obliged them to naturally be aware of how much water they consume. Despite this, they believed that they would not compromise their health and hygiene to conserve water which is also in line with their religious beliefs.

Regarding knowledge around solid waste management, concepts of waste separation and recycling were mentioned. However concepts of reducing and re-using were understood to a lesser degree. Most youths spoke of littering as a major problem, and when prompted to identify different types of waste, did so successfully. Most also revealed an adequate understanding of the concept of recycling, however argued that this was irrelevant as they mentioned recycling facilities were not widely available, and that even if they did separate their waste, it was going to be gathered once again in the same place. The impact of specific waste materials on the environment was also not perceived by many as a problem. Some mentioned recycling projects in Jordan in which various products such as water and glass were recycled.

In this group we also chose to look at employment as a variable to learn if employment status had an impact on people's knowledge, attitudes and behaviors. Generally we found that employment did not influence knowledge of environmental problems, as comparatively both employed and unemployed males and females from this background had somewhat similar knowledge of the three survey themes, while those who are employed showed more positive behavior towards energy and water conservation. This is due to them acquiring training through work to conserve water and energy (i.e in the hospitality sector). They also felt that they were working long hours and did not have much time to learn about environmental issues, and felt their knowledge was disseminated through their jobs adequately. The unemployed males showed deeper engagement in the discussion with us than their employed counterparts, or females generally due to several reasons:

a) Unemployment created more free time for youths to spend doing and learning various things. Males were also found to be more knowledgeable than females. As whilst females were mostly expected to perform domestic chores, males in this group were generally more mobile and mostly chose to spend their free time watching television to acquire information. Many of the youths seemed to have been exposed to various television programs on myriad environmental issues. Surfing the web was also prevalent in this group, though to a lesser degree. It was also perceived as an activity that was mostly connected to social networking.

b) Another reason attributed to increased knowledge was geographical location. Most unemployed youths in this background lived in residential areas affected by a visible environmental problem of some kind, such as air or water pollution. Hence they seemed to identify more closely with the direct impact of environmental problems on their communities and personal lives. They also recognize the huge role that human beings have on creating these problems.

Practices were seen to be the only dividing factor between employed and unemployed youths from this background. It was evident that those who were employed in this group had modified personal behaviors and more refined ethical responsibilities towards water and energy conservation. This was due to this group being exposed to certain required responsibilities and adhering to an international standard of environmental responsibility at the work place. Most employed youths from this background worked in hospitality settings and restaurants where consumption and disposal rules were rigorous.

Others in this group however were still found to be more flexible with their attitudes if persuaded and more willing to adopt environmentally friendly behaviors if facilities and alternatives were made available.

Lower-Middle Socioeconomic Class

Generally most youths in this group when asked what environmental issues meant to them, they responded with broad differences and generalizations. Most sensed the environment was something external to them, feeling no or very little attachment or responsibility towards it as though the environment was simply an additional activity to engage in, rather than a necessity to ensure resources for future generations.

When asked about what existing environmental problems they were aware of, most respondents in this group mentioned littering and air pollution also. Yet, when challenged further, they expressed ideas about green house effects and global warming, seeming to identify with global problems to a larger extent than to local problems. The sources of knowledge in this group were very varied and may have had an impact on their diverse views. Most information and knowledge acquired by this group of young people was obtained through foreign or regional media sources such as Al-Jazeera, National Geographic Abu Dhabi, and the MBC channels. Hence they could not relate external environmental issues to their own local context. Another major source of information for this group was the Internet, where we found most respondents generally browsed the web between 2-5 hours on a daily basis, for research, social networking or other entertainment purposes.

With regards to particular knowledge around the three survey themes, it was apparent that there was adequate knowledge about these, yet that it was broad and varied. Generally awareness around water issues was more developed than the other themes yet solid waste themes were found to be more relevant than energy.

Specifically, with regards to water, although youths had some background about Jordan's water scarcity problem; they did not generally feel concerned and could not recognize its long-term impact.

Regarding energy, this group had some knowledge about alternative sources of energy, specifically giving examples of solar which most have witnessed in use at home. What was more worrying however in this group was that very few could identify fossil fuels as main sources of energy for Jordan. Therefore this was translated in daily attitudes where they did not sense they needed to compromise or take responsibility for conserving. Whilst some demand-management practices for both water and energy were carried out at home, this was mostly due to parental pressure and influence, and economizing on costs. Furthermore, energy conservation practices were found to be higher than water conservation practices, which is a clear reflection of pricing strategies. Hence the key motivating factor for these practices was found to be economical.

Regarding solid waste there was a more developed awareness because this is a more visible phenomenon locally in public places, and therefore easily related to. There was also adequate knowledge of the collection process of solid waste, whilst only some had knowledge around sorting, recognizing that some waste 'scavengers' collect wastes for a fee to be separated and processed later. This group generally felt a

strong sense of value towards anti-littering, and expressed that they themselves practice this personally. The concept of re-using however was not a high priority to them. This group also sensed it was the government's role to reinforce anti-littering laws and provide appropriate facilities and legal enforcements to encourage more positive practices. They felt the government's current execution of its environmental plans was absent. Yet they equally felt citizens should take a more active and responsible role towards lessening the problem, however they could not pinpoint quite how this could be practiced.

Most of this group expressed having plenty of free time, and when asked what they did with this time there was a general trend of Internet surfing. Generally surfing the net was related to social-networking on sites such as Facebook, Maktoob, and Yahoo Messenger. This will be addressed in recommendations section of the report.

Upper and Upper-Middle Socioeconomic Classes

These youths generally had in-depth knowledge of environmental issues. When asked about environmental issues generally, their knowledge was much more advanced than that of their peers of other socio-economic groups, and could relate water, energy, and solid waste to a more holistic environmental picture. Most identified the various sources of water, and identified the different sources in Jordan. They were able to give an in-depth analysis of the problem, applying the knowledge, synthesizing and drawing comparative solutions. Some of the solutions drawn were to compare different countries and trends between developed and developing counties.

This group's discussion session was a reflection of their private schooling system, where questioning, critical thinking and rational reasoning are the basis for learning. They were able to identify renewable and non-renewable energy sources. Some also discussed mega projects that Jordan is embarking on such as the dead-red canal and the nuclear power project.

Regarding awareness around water issues, there was an understanding that water scarcity was a problem however they could not comprehend its severity and did not know what they could do about it. Although they understood water conservation concepts and practices, they still had a sense that their water use as compared with other sectors was generally minimal, so they didn't sense they needed to take further conservation action, as it would have no environmental impact. Another factor which may be affecting water conservation practices in this group is that generally their families live in smaller nuclear-family settings resulting in smaller households, and therefore higher rations per person.

Their inability to grasp the severity of the water situation in Jordan is also the facility and ease of gaining access to water. Even when they do exhaust water supplies provided by the government, it is easy to purchase new supplies and to meet their consumption needs. These classes therefore are not forced to adjust their demand behaviors, but rather can increase their supply. The motivation behind any existing water conservation practices is therefore mainly an ethical concern rather than a financial one.

Regarding energy issues, there was no awareness around energy shortage problems in Jordan, as they don't experience this in their daily lives. Some conservation practices were prevalent but these were more tied to understanding energy issues as a global problem, and taking responsibility for it as active abiding citizens who can contribute to environmental conservation. Energy costs were also a reinforcing factor to behavior but not a main concern as was found with the other classes.

This group's awareness of solid waste issues was considerably high, and their discussions covered reducing, re-using, and recycling concepts extensively. Their attitudes were also quite positive towards solid waste management. In this group knowledge was mostly acquired through being exposed to foreign education and practices in developed societies, such as the US and European countries. They were personally exposed to environmentally-friendly cultures, where individuals felt a responsibility and where

communities are active in their daily environmental practices. It is evident this had an immense impact on this group's sense of responsibility and need to contribute to protecting the environment. There was generally a sense of guilt around over-using solid wastes, not re-using and not recycling. This sense of shame stemmed from genuinely understanding that the environment is a living, fundamental and indispensable part of people's lives. Youths recognized there was a relationship between people and the environment. In this group environmental ethics run high.

The Internet was a widely popular source of information amongst this group of youths, yet was equally used for socializing and sharing experiences and opinions around a wider variety of issues.

Youth Comparative Analysis

Most youth surveyed, when initially asked to prioritize a number of issues that were important to them of a list of 6 issues- with the environment included- chose adequate employment opportunities and developing formal education system as top priorities, with environment taking precedence over the development of entertainment outlets for youths, better public transportation systems, and drug rehabilitation programs. This was a general trend observed regardless of social class.

The majority of youth respondents were proactive in responding to the issues raised, and where knowledge was concerned significant knowledge was evident with regards to water issues, whilst concepts around energy conservation and solid waste management were understood to a lesser degree. Youth from higher socio-economic backgrounds and those from lower socioeconomic backgrounds, generally had better knowledge regarding water, energy and solid waste issues. The earlier group's knowledge focus was on global issues and positive behaviors, while the latter had acquired knowledge through first hand experimentation and in general being aware of issues in Jordan. Those in the middle socioeconomic class category and the deprived had very little knowledge. The latter were disheartened and the discussion was continuously swayed towards fulfilling basic needs in life rather than dealing with 'luxuries' such as the environment.

However where attitudes, behaviors and motivations were concerned there were marked differences, with youth from lower socioeconomic backgrounds, both employed and unemployed, again showing the most positive attitude towards conserving water and energy.

Water

It was evident that across the three themes explored there was a greater concern for water issues generally, and most youth respondents had considerable knowledge about water issues relevant to Jordan. Most were aware of pollution issues and some of scarcity issues. However in most cases their conservation practices did not necessarily reflect this knowledge, and was more linked to other factors.

Most young people perceived that they practiced healthy water conservation behaviors, whether this was extrinsic or intrinsic. They unanimously expressed that they did not feel they used more than they required as individuals, with no real difference in perception between youths from different socio-economic classes. However it is important to note that when asked about factors influencing these behaviors, this varied from a feeling of personal responsibility to rising prices and religious convictions.

Energy

Knowledge of energy sources generally was varied, and conservation practices were prevalent in all socioeconomic classes. Most however perceived that energy conservation was mostly related to reducing electricity use, and very few youths understood the relationship between electricity services and sources required to generating electricity. When asked most youths mentioned random and varied sources of energy for example assuming electricity was powered by wind energy or just simply 'generators'.

Although most youths in this group had considerable knowledge of varied energy sources, their attitudes towards conservation did not reflect a concern for the scarcity of these resources, and in most cases behaviors were tied more so to economic factors than a real sense of responsibility for conserving resources. Most youth felt it was the role of the government to provide alternative energy sources to its citizens if energy scarcity was a problem.

Solid waste

Regarding solid waste management issues, most youths were aware of concepts of recycling, with waste reduction and re-use concepts being understood to a lesser degree, especially amongst the lower socio-economic classes. However sources of knowledge around this ranged from television programs to being exposed and participating in waste management activities. There was also an evident concern for littering amongst youth of all socio-economic backgrounds, which is revealed through their rating of littering as one of Jordan's biggest and most important environmental problems.

However most also expressed that separating trash for recycling was currently an impractical behavior in Jordan, as facilities are not presently available. Some also felt that their individual efforts would not make a difference if others weren't encouraged to participate equally. At the same time, most respondents also unanimously agreed that if facilities or alternatives were available (e.g. waste separation bins and re-usable bags at super markets etc) that they would participate in recycling and reducing waste.

Sources of Knowledge

Sources of knowledge varied across the board for different youth groups. The most significant sources that young people acquired their information from were television programs and the Internet generally.

However there was different value given to different sources of information by each socioeconomic group. The lower the socioeconomic class the more value was given to television as a main source of information and learning. Equally with an increase in socioeconomic status, came the dominance of the Internet as a major source of information. On the other hand Internet social networking was used considerably by youths from all socioeconomic classes. Facebook was found to be the most popular social linking medium and source of information on events, activities and programs, and was perceived to be a serious mode of communication and sharing information. Interestingly on Facebook, youth also play different environmentally themed social networking games such as Farmville and Simcity.

Despite young people's dependence on television and internet as sources of information, participation in hands-on and experiential learning was perceived by all youths as a preferred and necessary method of learning, yet an opportunity that was lacking. Most youths were willing to take part in participatory environmental education programs if the opportunity presented itself. Yet it was found that youths from higher socioeconomic backgrounds were presented with more opportunities for participation than were youths from lower socioeconomic backgrounds. We noted that youths from various socioeconomic backgrounds who had participated in environmental programs had a more enhanced awareness and more positive environmental attitude, as compared with their peers who had no opportunities to participate. These young people's awareness of their environmental impact was visibly more refined.

Attitudes

Generally we found youth's attitudes to be rather fluid. Once challenged by their peers through discussion, attitudes were easily swayed mostly towards positive concern for the environment. It was apparent that negative attitudes towards the environment were not based on strong inherent beliefs about issues, but rather simply on lack of knowledge or awareness. This fluidity in attitude reflects a willingness to change behaviors if opportunities for involvement, and services and facilities were available.

When discussing the government, attitudes were found to be a little more decided and fixed, however varied across the socioeconomic classes. The lower the socioeconomic class the more negative and fixed the attitudes were towards the government's activities. Yet some felt an individual responsibility stemming from religious beliefs. Equally with an increase in socioeconomic class, youths responded with a more casual emotion towards the government, and perceived the role of individual citizens to be equally important if not more so. It was evident they were not as dependent or as affected by the government's actions, and therefore felt indifferent.

Despite this, youths of all socioeconomic backgrounds felt that the government needed to play a bigger role to encourage its' citizens to take responsibility, through the adoption of policies and provision of services that were meaningful. This they mentioned should not include enforcing financial burdens by increasing bills, as it was seen to be a short term solution in changing people's behaviors There was a general fear of raising water prices. Youth from lower socioeconomic backgrounds also felt that reducing supply of both energy and water may be a more efficient way of managing the scarcity of resources. Generally young people concluded that consumption practices would not change unless people's knowledge about the severity of local environmental challenges was understood. A key recommendation made by many young people, was a need to create and launch an effective national awareness campaign to trigger emotional reactions that would naturally prompt a change in people's conservation practices.

Area of residence

It was evident that area of residence also had a marked impact on people's knowledge, attitudes and behaviors It was found that those youths living in areas that were more visibly affected by environmental problems were more concerned and realistically aware of the direct impact of these on their lives. For example young people living in Zarqa had greater knowledge and more willingness to act than their peers living in West Amman. They were aware of issues of water and air pollution caused by industrial activity in their area, and felt strongly about addressing these. Equally those living in areas where littering was observed on a daily basis, such as camps, felt more strongly about solid waste management, as well as participated in programs to learn more about alleviating the problem. Other youth in Deir Abu Sa'eed filmed a documentary through RFC about water problems affecting their local community. It was evident that in areas affected, community members and especially youth, organized activities to raise awareness of the issues that concerned them. These ranged from lectures and field visits to sites affected, to creating environmental committees to research local environmental problems and address them.

Age

Where age was concerned it was evident that the younger the respondents were the greater their theoretical knowledge of the themes related to this survey.

There seemed to be an apparent gap in knowledge between young people just graduating from the formal education as compared with their peers of college age or older. When questioned youth who were recent graduates or who had recently been enrolled in school understood the specifics of our survey questions and responded proactively to a better degree than their elder peers. Yet environmental themes were still only understood conceptually, and were perceived to have little practical meaning and application in daily life. Whilst older youths had knowledge about environmental themes and practices that were mostly global and formulated stronger attitudetowards these, they found it equally difficult in some cases to link the relevance of these concepts to their daily lives.

This may have to do with a more recent memory of these themes through study lessons that the younger respondents retained, yet also reveals that the learning process in formal education is focused on theoretical approaches to pedagogy than hands-on learning. And so this creates a break in knowledge and a difficulty in finding relevance between subject matter and applicability in the real world.

Knowledge in both groups still had very little impact on practices of either group, and rather behaviors were informed by other influences such as parental pressure, financial pressure, and in some cases personal experiences.

Gender

Gender differences also presented some variance in knowledge, attitude and behavior through our focus group discussions and individual interviews we found that male and female respondents had similarly broad knowledge of the environmental themes in question. Yet, females from lower socio-economic backgrounds were unable to give in-depth analysis of situations when compared to their male counterparts in this group. Attitudes and behaviors appeared to be different however between males and females of all socio-economic groups.

It was evident that females generally had a lot more interest and concern for environmental issues. They felt a greater sense of responsibility towards participating in positive environmental behavior than males. A part of this sense of responsibility stemmed from a concern for the livelihood of future generations. It was also evident that acquiring more positive environmental behaviors was a greater interest amongst females. This may have been due to females having more of a domestic care-taker role and a perceived 'expected duty' to ensure their children lived in healthy and resourceful environments. Females for example did not experience the burden of having to achieve economically. On the other hand males of the same populations considered finding gainful employment a greater priority than concerning themselves with environmental problems. Males sensed it was more important to become 'providers' for their families, prior to ensuring that they practiced environmentally friendly behavior

Regarding behaviors, both males and females expressed similar practices around all three themes. The perceived impact that the sexes had on the environment was also a shared perspective. Males and females from lower socioeconomic backgrounds felt that men are more destructive to the environment than females are. Whereas males and females from higher socioeconomic backgrounds felt both men and women were equally responsible and should continue to take equal responsibility by virtue of being human. This may have been linked to perceived cultural gender roles where for example in lower socio-economic communities males were the main actors and contributors in society and therefore were seen to have a greater negative impact on the environment. Whilst with increase in socio-economic class, females became more equal competitors and therefore were given greater responsibility in these communities, and were seen to have a more equal impact on environmental problems as males do.

Note: **Appendix 4** presents a summary of this segment, highlighting influential sources of knowledge and mediums though which to reach young people from various socioeconomic backgrounds.

3.2 Non-formal Sector Case Studies

The Children's Museum

The Children's Museum in Jordan exhibits a hands-on learning approach to a broad variety of concepts, from scientific to real-life situations that encourage children's educational and social development. The museum's large main halls, facilities and exhibits are divided into 8 main areas, and therefore can accommodate a great number of visitors at any one time. Additionally there is a library where children can locate books and information on a wide range of subjects; a toy store; and an arts room where paper, plastic and other waste is re-used to create arts and crafts and other functional objects.

The museum's exhibits are visually appealing as color is used in abundance and touch is invited to promote experimental exploration. The exhibits are generally a rich resource and great opportunity for children to learn. Its accessibility is also one of the museum's greatest strengths as the museum's

agreement with the Ministry of Education provides children from varying geographical locations and socioeconomic backgrounds an equal opportunity to access its grounds as part of the Ministry's extracurricular activities.

The environmental exhibits featured explored concepts on sustainable development, ecosystems and a range of concepts relevant to this survey found in a designated area of the museum called the 'Energy Lab'. The Energy Lab featured around ten exhibits illustrating the water cycle and water use and conservation; energy sources and creation through kinetic energy and solar powered energy, and waste separation and management.

Although the exhibits serve as a highly valuable tool for learning, during our review we also noted some issues in the presentation and maintenance of exhibits generally. We will use the Energy Lab as an example to highlight these. First, the Energy Lab has a unique problem in that it is located in a corner of the museum that is off the main footpath where most of the exhibits are featured, therefore making it not as easily reachable on a first visit to the museum. The main footpath includes the largest number of exhibits, and so children and accompanying guardians scarcely have time to experience these let alone reach the Energy Lab on the same day. Consequently, location presents a unique challenge in encouraging people to reach and explore the Energy Lab. This was also confirmed by museum staff, and validated through our experience, where in both instances we visited the lab on busier days, it was vacant.

Also the relevant environmental exhibits were more difficult to understand than the rest of the museum's exhibits, although all museum exhibits generally used mostly long textual explanations to describe concepts, and lacked visual or audio directions on exhibit activation. For example in the energy corner a solar reflective panel was present to move a 'superman' above, however there was no explanation or demonstration of how to use the exhibit, or a clear indication of how solar energy was used to mobilize the object. There were also two other malfunctioning exhibits that used kinetic energy to power electric appliances. An energy conservation exhibit presented a range of domestic electrical appliances (TV, washing machine, oven, AC unit and others) which could be activated by pressing buttons to turn the appliances on. Upon turning the appliances on, a measurement scale in the center of the exhibit would reveal to children how much energy was being used by each or all of the appliances. However it was relatively difficult to guess that this was the measurement scale to observe while activating the exhibit, and additionally it was malfunctioning. There were many other examples of these same problems affecting other exhibits. There were no fully-functioning exhibits.

Another issue that compounds this problem is the absence of exhibit assistants to demonstrate to children the use of the display and learning involved in participating. Our observations revealed that children tend to approach exhibits based on attractiveness. For example they approached exhibits to press buttons, pull knobs and handles without a true perception of what the exhibit is exposing in terms of learning. The absence of exhibit assistants also made certain that the exhibits were mishandled by children in most cases and therefore many were ruined, inactive, or malfunctioning to a point where they did not contribute to the learning process anymore. Some of the environmental exhibits around waste management were dangerous as they exposed sharp objects such as empty soda cans that were easily within reach.

Throughout the museum we also noticed that maintenance was a real challenge. Due to a combination of the problems listed above maintenance work was required on a regular basis and yet could not be sustained at the rate that visitors were accommodated. However if assistants were present to manage the exhibits these problems would be less frequent and more easily manageable.

Museum Entry and Exit Interviews

The research team carried out 32 entry and exit interviews with the same children aged 7-11 to discover their general knowledge around the survey themes and to explore any impact the environmental exhibits may have had in terms of adding to their information and developing their awareness and understanding of the concepts observed. Since visiting children were school-aged and mostly attended through organized school trips, their knowledge of the environmental themes relevant to this study was generally broad as they were exposed to it through the curriculum.

Generally it was evident that most children interviewed had knowledge about the three themes and that the wealth of this information had been acquired through formal education curricula. Water and energy sources and conservation practices (e.g. closing the tap while brushing teeth, turning off lights and electrical appliances when not in use etc) were stated frequently and seemed to be easily recognized, revealing an adequate level of awareness with little variation in answers. Yet only half of the group interviewed had knowledge of recycling and separating, and some of these children had experienced recycling processes at their school.

Of the 32 children interviewed only 9 were visiting the museum for the first time, whilst the rest had been there at least once before. For all first-time visitors, the Energy Lab remained an unknown area and which they had not had time to explore on that day. However interestingly, those who had visited the museum once before, also had difficulty identifying the Energy Lab as a familiar place, although some did.

When asked what their favorite exhibits for the day were none of the children favored the Energy Lab. Some of the more popular exhibits included the archaeological dig, and the mechanics section looking at plane and car powering, as well as the 'Stars and Space' exhibit. When the energy lab was cited by the research team to the few children that knew it, it was not expressed as an area of interest. This may be due to its isolated location and its exhibits lacking the interactive element prevalent in other exhibits.

There was a noticeable difference in response rate and engagement with the interview questions upon exit as compared with initial entry to the museum. Entering children had some knowledge around our survey questions but were equally unfamiliar and disengaged with many. Yet it was visible upon exit that many of the museum exhibits had a significant impact on the children's knowledge, though interests varied from child to child and did not necessarily reflect increased knowledge of the survey themes. In most cases it appeared the visit was a successful opportunity for learning through play, and children showed an increased excitement towards what they had learned on that day and were willing to share this knowledge enthusiastically.

Some children were not as responsive to our questions and seemed to enjoy the process of play without connecting any learning to the experience. This may be attributed to several factors such as age, school, and the active involvement of teachers or lack of it.

Furthermore, exhibits that were more interactive utilizing movement, sound, color and light were found to be very popular and entertaining, although exhibits that encouraged children to perform active role-play appeared to be the most effective in translating concepts into applicable reality. These merits reflect the great potential that the Children's Museum can have as a place of dynamic learning.

Differences in knowledge between male and female children regarding our survey themes were not very discernible. Some subtle differences were apparent in approach to the exhibits. For example males and females seemed to be attracted by different exhibits. Male children showed more interest in mechanics and exhibits that involved active movement, whilst females seemed to enjoy a wider variety of exhibits. Females also seemed to be more responsive to the learning process involved in the exhibits than did

males, who seemed to be more interested in the play factor. Yet both males and females reflected a more heightened interest in concepts following the visit than at its start.

An important element to review that may have an impact on the children's learning was the presence of their educators and the role they play in this environment. We interviewed two teachers accompanying two different groups to explore their perspective on museums as a valuable method of learning and to discover what impact they had if any, on the children's understanding of exhibits.

Both teachers felt the museum was a positive and important learning environment through which classroom lessons can be clarified and reinforced. They perceived it to be a helpful supporting tool to formal curricula, however also noted that the time and duration of the visit made a difference on how much of an impact the experience can have on children. For example where visits were carried out prior to classroom lessons teachers felt it was more difficult for children to make connections between these and the exhibits. This may of course be a fault in the formal education approach to learning and not necessarily timing. Additionally the hour and a half time-slots provided by the museum for groups was perceived as too short a time to experience the museum and engage in its exhibits fully.

Despite the teachers' positive outlook on the museum experience, they seemed to express little about their role in the learning process, whilst one openly viewed the visit as more of an opportunity for children to have fun than to really learn.

This also is an important factor affecting the efficiency of the learning experience, as children receive little support and assistance on the use and value of exhibits. It is vital that children are accompanied by adults, either relevant teachers or museum assistants to make more sense of the learning involved. This has been previously recommended as an important improvement to be made to the museum's services.

Haya Cultural Center

The Haya Cultural Center is open to the public and provides facilities for a varied extracurricular program to school-aged children, emphasizing interactive and experiential approaches to educational development. The center is set up in several geographical locations and aims to inspire a sense of responsibility towards the community and the environment through these activities. The main center's facilities include a children's library, theater hall, arts and crafts workshop, computer lab, and a science and environment museum. During holidays the center accommodates between 200-300 children a day, and is a popular destination for many schools interested in assisting children in their extra-curricular learning. Visits are scheduled at the beginning of school term, and the most popular sections of the center are the Planetarium and the Traffic Park.

The center has also developed and launched a training program for school teachers to encourage the use of active and participatory learning in the classroom. Additionally programs are provided to support mothers and encourage their participation in empowering their children and supporting their creative development.

Haya has previously worked successfully on relevant environmental projects, and these have reached out to a large number of youths across the country. The center's staff and volunteer team also represent a valuable human resource with ample knowledge of the environment and skill to interact with young people, therefore conveying messages appropriately. The staff use performing and visual arts as mediums for raising awareness and knowledge dissemination. Haya center seems to have invested vastly in a talented and dedicated team, who implement all programs using art, interactive drama, and learning by doing approaches. These approaches have proved very successful in reaching to youth who are eager to learn by experimentation.

One of the more successful projects previously implemented at Haya in 1995, was 'Tartoush' , which was an initiative created to teach children about the water cycle, water scarcity and pollution in Jordan through an interactive training workshop, as well as encourage their participation in environmental clubs at the center and elsewhere. Haya has also previously developed and extensively performed a children's play that tackled solid waste issues, the resulting pollution these wastes can create if kept unmanaged, and the long term environmental impact these would have on nature. The play toured across the Kingdom and ran for five years before management decided that its concept and theme was exhausted.

Although the environmental museum was previously also a popular learning resource and facility, which included exhibits on endangered species in Jordan, it currently unfortunately holds no exhibits due to the exhaustion of materials and lack of allocated budget for its maintenance.

Generally the center has successfully implemented projects in the past however sustainability of these has always been an arising challenge. Major changes in management with inconsistent objectives and visions for its' future operation, has left the center in a 'transitional' phase for so long. In addition, running the exhibits free of charge has thus created a problem in sustaining project staff. Previous projects have also been exhausted. This has had an impact on staff morale and sense of job security.

All these factors coupled with a lack of new initiatives and activities have been disadvantageous to the continuation of programs and outreach efforts, causing youth participation to decrease.

Though the center faces some challenges in improving its outreach to young people and communities, and enhancing its current services, there remains a substantial wealth of resources and previous experiences on which to build on to restore its activity, popularity and use as a hub for youth congregation. The center still receives large numbers of students daily from schools since the visits have become a major part of the school non-formal program. Summer camps are also still held and are popular with youth. These can be utilized to re-activate previous environmental programs and establish fresh approaches to working with young people to improve critical thinking and positive behaviors towards the environment

The center is currently focusing on broadening its environmental activity with young people, and is open to new innovations. The management of the center is very perceptive to the idea of renovating the entire center making it the only "Green Museum Building" in Jordan. There is potential to re-introduce innovative, virtual and visual exhibitions on water and solid waste within the museum's space that can enhance its presentation and reactivate its use. The science museum exhibitions on the other hand are better maintained and can potentially incorporate energy conservation and alternative energy concepts with great ease and success.

The research team also visited the center's Mobile Library, 'Drive to Read', twice to map available resources and view the interactive sessions taking place. The library included a wide variety of books, the majority of which were evocative stories to transmit messages to children from 1st to 5th grades around various concepts. The library also included a broad selection of encyclopedias with different emphases including linguistic, scientific and developmental.

A collection of publications by the 'Farasheh Publishers' included a series titled 'Limatha Yajib 'Alai' or 'Why I Should…' and transmitted different messages through stories on the importance, value and methods of conserving water and energy consumption, and contributing to recycling and reusing materials. There were also other resources that looked at different general environmental protection themes as well as water and air pollution, littering and the re-use of waste materials to create useful arts and crafts. However the emphasis on environmental resources was limited.

We interviewed two of the workers operating the mobile library 'Drive to Read' to find out more about the session and the methodological approach to conducting the sessions. The mobile library develops a yearly work plan that correlates with the Ministry of Education's formal curriculum, and hence matching the concepts learned at school, although using a more practical and entertaining approach to learning. Each concept is highlighted for a month and each week of the month is used to teach these concepts through different mediums, including story-telling, experiments, arts, and a theatrical performance on the concepts taught. These provide the young people with an opportunity to interact with the educators, artists and youth workers around the themes presented, through various methods.

The sessions were successful in encouraging young people's involvement and interaction with the concepts. A component of their outreach curriculum included looking at environmental concepts of water and energy sources, use, and conservation, and waste separation and recycling methods, as these were also connected to study sessions in the formal curriculum. Although the 'Drive to Read' approach seems to be outreaching to children successfully and encouraging participation of youths from various backgrounds and using varied mediums, it's outreach remains limited as it can only be present in certain locations at certain times and staff are fewer than what is required to provide a more extensive service.

Haya Center Youth Perspectives

Two focus groups were carried out at the Haya Cultural Center museum with 15 youth participants per session. The groups were segregated by age group, with the 6-9 age-bands in one session and 10-13 age-bands in another. Knowledge of both groups relating to water and energy issues was primarily acquired from their schooling system. The youth respondents were actively engaged in the session and were able to name different water sources, however were unable to identify the major sources of water for Jordan. The older youths referred to rainwater as the main water source, while the younger respondents identified sea water as a main source of water for Jordan. Respondents from both groups were aware that there was a water shortage problem in Jordan and were able to name at least three conservation methods which included closing taps while brushing teeth, and washing cars using buckets instead of hosepipes.

Regarding energy issues, it was found that the older group were more knowledgeable. The younger group could not associate electricity generation with energy resources; stating electricity comes from wires and the 'electricity' company. Additionally they only had minimal knowledge of renewable and non-renewable sources. In the older group however, respondents were aware of energy issues and could differentiate between energy types and sources. Only one respondent had knowledge of the relationship between oil fuel and energy generation. This group could also identify renewable vs. non-renewable sources, yet stated they believed solar and wind energy were the main source of electricity generation in Jordan.

Some basic energy conservation practices were also prevalent with both groups, such as turning lights and other appliances off. However these behaviors seemed to have been learned and practiced at home and motivated by parental pressure.

Regarding solid waste, both groups had adequate knowledge of different waste materials. However the younger group could not adequately identify which waste materials were bio-degradable and which posed a unique hazard. Furthermore neither group could identify with concepts of reducing and re-using waste. All children however strongly identified with anti-littering practices and believed they should keep their school and neighborhoods clean. They also mentioned participating in a Haya Center activity which included a 'Cleaning day'.

Generally youth responses reflect that knowledge was acquired through the formal school curriculum and little was mentioned in connection to Haya Center activities. This is a clear indicator of the absence

of intervention due to recent redevelopment activities which incorporate a new vision driven by her Royal Highness Princess Haya. This renovation however, could represent an opportunity to work more closely with Haya Center to re-activate an extra-curricular environmental program.

4.0 RESOURCES: MAPPING SOURCES OF KNOWLEDGE AND PARTICIPATION OPPORTUNITIES/ PROGRAMS

The research team carried out a number of field visits to institutions and organizations that deliver environmental messages to young people. Each organization played a different role in the education of children, with some doing it more intentionally than others. Key persons at these organizations were interviewed to identify mediums used to disseminate environmental messages; learn the objectives of their activities; and to assess effectiveness, outreach and the impact on young people. The survey also explored individuals' personal views, opinions, and attitudes towards the environmental themes proposed. This inevitably gave birth to a set of recommendations that many of the individual interviewees unanimously agreed on.

For ease of compiling the varied findings, the chapter has been separated into retail-based and organization-based resources. The retail-based resources will feature a variety of resources found at bookshops and toy stores that are popular to communities from different socioeconomic classes and known to target children and young people of the relevant age group. The organizational-based resources section will review tools, programs and mediums employed at each organization included in the survey to provide a deeper look into their usefulness and sustainability. A list of these resources is presented in **Appendix 5**.

4.1 Retail-based resources

This section will feature a review of the resources examined at bookshops and toy stores. The research team carried out visits to three bookshops and three toy stores according to their popularity and accessibility to our target populations. Although these resources catered to a variety of age groups, they were generally quite limited, mostly unorganized and seemingly secondary in importance. In some cases book keepers and toy store assistants had no knowledge of the existence of these resources at their stores.

Bookshops

Generally there were very few publications carrying environmental messages that targeted children of school age, but of these the few found focused on children aged 5-8 years old. These were mostly informative coloring books, children's stories, activity books and three children's encyclopedia. The themes featured in these books mostly concerned world weather, the greenhouse effect, global warming

and general environmental protection concepts. Some concepts of water and air pollution were also explored as causes to global environmental challenges.

Conservation-related resources were rare however, and of the few found water conservation was most prevalent. Two activity books were also found on waste re-use. These did not particularly teach children how to separate waste, or reduce the impact of waste on the environment, but rather encouraged them to re-use household items to create toys and other useful objects.

All of the books reviewed were foreign imports and many had little relevance to Jordan's particular environmental challenges. Children's coloring books for example were imported from India and looked at environmental issues relevant to India's experience, such as pollution of Indian rivers and deforestation.

At the other end of the spectrum highly specialized college textbooks were available on water management systems, water re-use, some waste recycling titles, and some references to renewable energy concepts mostly found in Civil Engineering textbooks on other subjects. However all these were only relevant to students of these related fields and whom may already have background knowledge, as they were of an advanced level and highly theoretical in nature. Furthermore, in all instances they only featured case studies on countries with very different environmental issues and challenges to Jordan's, e.g. Latin America, Europe and the US. Additionally most of these books were old prints with very few recent titles. There were no titles focusing on Jordan's unique experience or the region and other surrounding countries. Bookshop attendants also mentioned that these sections were rarely frequented by visitors, quoting an average of 10-15 people a year, most of whom were currently enrolled geology or engineering students.

It is also safe to note that energy conservation was mostly an absent concept across the board and for resources targeting all age groups.

We found accessibility of these resources to be another issue, as most found were in the English language. In the more specialized and/or relevant resources, the concepts were highly theoretical in nature, lacking an ease of practical application to daily life. The college and more specialized textbooks were also quite costly ranging between 50 to over 100 JOD per book making these affordable only to a very small population, who would be particularly interested in the subject matter.

Only in one instance did we isolate an Arabic children's encyclopedia titled 'Wind and Energy', which is part of an 'Environmental Conservation Series' and is an adapted version of the English. However, in this case the remaining titles of the series were unavailable and had not previously been ordered by the store. This reveals a lack of organized effort to disseminate environmental messages.

Generally at all three bookstores when assistance was requested by the research team to locate relevant resources and information on water and energy conservation and solid waste management, assistants did not identify with the request, and in most cases the term 'environment' was perceived as specifically related to bio-diversity. When the team asked to find resources on the three specific themes related to the study, in most cases we found random resources when assistants had said there were none. This reveals a need for further awareness around the particular environmental concepts related to the study.

In summary, although information was varied, very few books were geared towards developing environmental awareness, responsibility and action, and even less so as related to Jordan's experience. Dissemination was unorganized as target populations were not clearly identified and most resources were not in the Arabic language making most of it inaccessible to most Jordanians. There was also little interest amongst book keepers and shop owners to invest in environmental resources as these were

perceived to be unpopular and very particular, and were given significantly less priority than was given to other subject areas and themes.

Toy Stores

We also visited three toy stores to explore existing children's resources that promoted environmental awareness and positive environmental practices. The three stores selected are of the more popular toy stores in Amman including one which has branches in several areas across the western and eastern part of the city and which is quite popular with the general Jordanian public. As expected, focus on environmental messages was lacking, but some rare resources did exist. Most were games and puzzles teaching biodiversity and balance of nature concepts. And as toys and games which explored concepts relevant to our survey were rare, we will list these here.

Only one game was found which educated children on the water cycle. This was a race board game with informative facts about sources of water, uses and stages of the water cycle-from evaporation, precipitation and use. It is aimed at beginners and includes other basic environmental concepts such as the relation between the sun and the water cycle.

With relation to energy concepts most toys found were science kits educating children on the use of kinetic energy to create electricity. However these strictly looked at electromagnetic themes and the practical transformation of energy, but had little to do with scarcity of energy resources, conservation or renewable sources. Only one game was found on recycling concepts. The game consisted of a workshop kit containing a manually-operated machine that teaches children the techniques of paper recycling whilst also creating different shapes and colors.

In all cases store assistants had no previous knowledge that some of these games were offered on their shelves and when asked believed that they had no games of the kind.

Although costs of these toys seemed to be reasonable ranging between 8.99 JOD to 26.99 JOD, again with regards to accessibility, most gave instructions in the English language and therefore would be unreachable to most Jordanian children and youth. Al-Mikhi, the more popular toy store with local communities, had a selection of mostly Chinese-made toys which also had instructions in other languages including English, but none in Arabic.

4.2 Organizational-based resources

This chapter will include a review of the most relevant ongoing environmental activities implemented at various institutions previously known to have contributions in this field, and to identify other potential opportunities for further engagement in environmental education. The survey included field visits to these organizations to examine programs and activities, to assess their accessibility and impact, and to interview key individuals to hear their recommendations on what is required to develop further interest, awareness and participation in environmental issues. In the final section of this chapter an analysis of the mapping exercise and interview findings will be presented to summarize common gaps found and provide suggestions and recommendations for moving forward.

To simplify the findings of the mapping exercise, a SWOT analysis methodology was used by the research team to identify existing strengths and opportunities from which to build on, recognize any gaps in outreach, and also to learn of threats to the sustainability of environmental activity at these institutions.

Existing Resources

Jordan Environment Society (JES)

The Jordan Environment Society's activities focus chiefly on raising public awareness amongst youth aged 7-30 years. JES has 15 offices distributed across the governorates through which they hope to reach out to the widest population of youth from varying socioeconomic backgrounds. Although the majority of their activity is based in Amman, there is considerable public awareness campaigning elsewhere with local communities and in partnership with community leaders.

Key relevant former projects and environmental activities have included education and awareness campaigns to raise knowledge of water scarcity and efficiency; developing improved mechanisms for solid and medical waste management with governmental bodies; and raising the capacity of institutions and their employees towards enhanced environmental management and responsibility. Yet many of these projects have ceased due to intermittent funding, lack of sustainability plans, and concluded agreements. JES has also developed a variety of publications to outreach to various populations from young people to local communities, and businesses, ranging from awareness hand-outs and brochures, to children's stories and short documentaries on relevant environmental issues. Many of these also are infrequently accessible to the general public however.

Currently JES is developing a number of new projects, though their two key ongoing projects are the recycling project and environmental management training. The recycling project is an initiative that has chiefly focused on raising awareness of environmental issues related to resources and waste management through dissemination of informative material and seminars held at local communities. The project has also set up collection points to encourage increased participation of the public in re-use and recycling of paper and plastic material. Although this seemed to be a successful initiative in theory many community participants in the recycling process with JES have criticized the unorganized collection process and customer service.

The Environmental Management Training Project works more specifically with medium-sized businesses to promote and educate employees on 'green' concepts and practical application of these through increased understanding of the ramifications of certain practices. They also carry out environmental impact assessments (EIA) to determine areas for improving green practices.

These workshops are also open to individuals and young people, however there is very minimal participation amongst individuals as course training costs are a deterrent to most people's participation, especially young people, and course themes may not be as relevant to individuals.

Although JES's current scope of work has downsized considerably, and their outreach efforts have declined, they have had an extensive experience of partnering with governmental and civil society organizations to develop environmental policy and practice, and this can provide a substantial platform for further developing policy reform in environmental management
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The National Centre for Culture and Performing Arts(PAC)

The National Centre for Culture and Performing Arts works extensively with youth through the use of creative arts and interactive theater-in-education approaches to disseminate varied social and cultural messages and promote healthier social and political participation and citizenship.

PAC's most relevant and active effort in environmental education has focused on raising young audiences' (aged 6-12) awareness of issues of water resources scarcity in Jordan and the long-term impact

of water misuse, and promoting positive personal conservation practices through puppet characters relaying conservation messages.

The puppet show theater 'Qatrat Maa' or 'Drop of Water' is an interactive puppet drama which uses puppet characters to tell a story involving a series of events occurring within the same community, followed by an interactive discussion with audiences to discuss the story's implications. The aim of the play is to instill in children a sense of responsibility, that they too have a role to play in lessening the impact of the problem. The play reproduces events of individuals misusing water through certain doings (e.g. irresponsible car washing) whilst others within their neighborhood are affected by lack of water for days.

The show leads slowly to prominent scenes set in the future, including a 'nightmare' scene by the main puppet character. The scenes depict rising water costs, where community members are required to present a case for purchasing water, whilst others are skirmishing to obtain the first drop of fallen rain, and yet others do not have enough to care for their personal hygiene. This scene is enacted to reveal the impact of water misuse and wasting, and eventually leads to an in-depth interactive discussion between the main puppet character and young audiences. Children are asked to think of other damaging consequences if such a scenario was to become reality, and to try and come up with solutions to reduce water waste.

The young audiences participated actively in the discussion and reflected an enthusiastic appreciation and understanding for the concepts embedded in the story. Most children presented the puppet facilitator with practical daily behavioral changes that can be solutions to lessening the problems. They also recognized that these can be achieved through individual responsible practices such as ensuring taps are closed and using water only as needed. The show is concluded with the main puppet character taking an oath in unison with the young audiences to conserve water through specific actions read out together. The pledge is also handed out to all participating children.

The show's scope of outreach has been extensive and has reached over 200 schools public and private and other social welfare organizations across the Kingdom. Part of its success is its unique experience for children and use of humor to portray its messages, but also more importantly the skill of the artists in researching issues beforehand and re-creating an audience-specific presentation. An effort was made to focus on pressing issues and conservation needs particular to that geographical community and portrayed customs and dialects that were relevant. Characters were transformed to reflect community members living in neighborhoods known to the audience. These factors made the show accessible to children and easily identifiable to them. However one issue arises here and that is follow-up and impact assessment. As communication is not maintained with teachers or educators, it is not easy to measure practical impact of the show and its messages may very well have been forgotten.

PAC has currently been requested to develop three more interactive puppet plays on environmental topics including energy conservation. However these are in preliminary stages and no further information could be obtained at the time interviews were carried out.

Although PAC's current scope of environmental work is narrow, their methodology and creative approach in disseminating messages, coupled with a team of talented and creative artists with vast and long experience of working with young people across varied geographical locations, presents a potentially thriving opportunity to provide an effective means to educating children interactively through entertainment.

Royal Film Commission (RFC)

Film is a relatively new field in Jordan and a form of artistic expression most Jordanians have not experienced first-hand. The RFC was established to promote a culture of film amongst various communities across the kingdom through screenings of Jordanian productions, but also to encourage, educate and train community members to use film as a form of communication to disseminate messages. The RFC is also fully furnished with the latest filming equipment, sound rooms and editing suites that can be reserved and used at minimal or no cost by local communities. Part of RFC's mandate is to also promote Jordanian productions through training interested individuals and communities in a variety of filmmaking skills and processes from scriptwriting to creative filming and editing. Although RFC focuses on promoting the Jordanian film industry amongst youth populations they are open to interested individuals of all ages, however focus on developing projects mostly for school and college-aged children.

RFC nevertheless does not cover a specific educational curricula or framework, and the scope of topic to explore through film is left wide and open to the filmmaker's interest and passion. This has allowed various individuals to research and explore their own topics and express these through film.

RFC has explored the topic of the environment only very rarely, and has had some participatory activities involving youth where the topic of the environment and its social implications had risen and been shot on camera. However in this instance also it was very minimal work.

The RFC set up several initiatives to involve school-aged youths in filmmaking to spread a message they were concerned about. These projects ran over a period of five months where young people experienced a learning process that involved researching their topic of interest prior to the filming experience; developing its content, training to use all required equipment and carrying out the production of film. When the films were finalized and ready for screening, RFC invited local community members to attend the screening either at the RFC base or suitable local community centers. Only in two specific cases had two separate groups of youths explored environmental issues. A group of young females from Deir Abu-Saeed explored the challenge of water shortage in their own community, and a group of males from Amman explored the phenomenon of littering and provided recommendations for developing recycling programs.

Although the projects were successful in developing young people's sense of expression, identity and skills; the scope of these projects was restricted as equipment is limited and funding for it scarce, as well as in-house suites few. This was perceived by RFC staff as a challenge to broader outreach. No more than 20 schools could be involved in the initiative at any given time. However RFC continues to encourage young people to attend screenings and participate in communal workshops to develop their skills in this field.

The RFC also organized an environmental week titled 'Seeing Green' for the first time last year in cooperation with various embassies and the Jordan Green Building Council. The film week presented films produced nationally and internationally and the aim was to stimulate debate and discussion around the themes presented. Two of these short films shown were produced in Jordan - one recapitulating current environmental issues in Jordan following 50-year degradation and produced by RFC, and another exploring a water crisis at a local community produced at RFC however filmed by a group of students from that community. According to RFC it was a successful activity that was received well and attended extensively by various communities. The debates following the screenings also revealed an active interest in Jordan's environmental challenges. In some instances schools coordinated with RFC to receive copies of the films shown to screen at their own schools.

Although RFC perceives that interest in film is growing and opportunities for young people to participate are widening, there is still a challenge to promoting environmental issues through film

especially amongst rural communities where social challenges are prioritized over local environmental concerns. However RFC reflected an enthusiasm to work extensively on environmental themes where opportunities and funding were provided to mobilize such projects with young people. RFC has also held several short film competitions at various school where students took on the projects enthusiastically and seriously producing a small library of Jordanian youth films.

RFC 's team of artists and filming crews have a wealth of experiences and are personally dedicated to working with young people through film to portray national challenges and local community concerns. This could serve as an option for extracurricular activity and complimentary medium to formal education curricula.

Miyahuna

Miyahuna is the privatized water distribution company with a mandate to distribute water to the Greater Amman area. As would be expected, the Miyahuna customer base is large, at about 460,000 users, serving approximately three million individuals from various areas.

Miyahuna also develops educational resources targeting multiple population groups including children, teens, adults, and expats from different cultural and linguistic backgrounds. Resources include pamphlets and brochures in different languages to raise awareness of the particular challenges Jordan faces regarding water resources and scarcity.

Currently the company is also implementing an awareness campaign targeting different segments of the population; yet focusing on raising awareness amongst young people through programs and resources such as storybooks and role-play. One of the highlights of the campaign program is an educational kit for school-aged children that uses two main cartoon characters, Farah and Rayyan- two water droplets, to present and bring to life the issues concerned, and address these using an entertaining and enjoyable learning approach. Other resources included in the kit are an activity book, a story on water conservation, color pencils and pens, a t-shirt, hat and a "ticket book".

An outreach team is designated to carry out visits to schools across the greater Amman area, to disseminate the educational kit and implement a day-program with children to activate the learning materials included.

The day-program incorporates a 'story time' session where the main story is read out to children and an interactive session takes place with the facilitator around the themes presented. The program emphasizes the value of individual and communal responsibility encourages children to take responsibility and make others aware of the importance of positive water conservation behaviors. The program achieves this through a 'role-play' approach, appointing children as "water police" and with that comes the responsibility of ensuring others practice positive water efficiency. The child 'Water Police' can issue violation "tickets" to others who are misusing water at school or in their community. This innovative game not only educates children about the severity of water scarcity in Jordan and the importance of its conservation in a fun way, but also instills in them a sense of public and civic responsibility from an early age.

A clear advantage of Miyahuna's campaign lies in its wide customer base. It has the potential to reach out to tens of thousands of children and youth from diverse populations and backgrounds. The campaign strategy seems to be effective in theory as children have little opportunity otherwise in school to learn about environmental concepts through play, although it is important to note that as of yet no impact assessments have been carried out to assess the project's success.

Another issue worth pointing out is though the campaign's focus is on raising awareness of water issues; this is not approached holistically and little attention is paid to other environmental concepts. An example illustrating this is Miyahuna's children's 'water' festival. The festival was carried out in Queen Rania park in Al-Quweismeh and included a puppet show, a water meter reading demonstration and other arts activities for children. The art activities oddly enough brought children in groups to decorate cut-outs of the popular droplet characters, Farah and Rayyan using Styrofoam. This reveals a lack of awareness around the connections between different environmental elements and concepts, and how these can shape a broader concern for the environment. A better alternative could have been the use of recycled or easily recycled materials and connecting waste concepts to water protection issues. Such examples of the absence of a holistic environmental vision were prevalent amongst other service providers.

However, most resources produced at Miyahuna remain very conventional and lack the creativity and the hands-on approach needed for a successful ongoing program.

Pioneers-Hikayat Simsim (Sesame Street)

Unlike many of the various organizations and institutions included in this survey, Pioneers have specifically developed an environmental component within their education curriculum for Hikayat Simsim. In their framework of educational objectives for the upcoming seasons 3 and 4 the environment is tackled as a key theme through teaching about the natural environment as well as developing environmental awareness. Topics explored are varied and constitute various environmental themes related more specifically to Jordan. Daily water and energy conservation behaviors will be encouraged through teaching children that these resources are limited and therefore extremely valuable. A recycling segment will also be included to a lesser degree to encourage children to re-use materials and separate them for recycling where facilities are available.

Previous seasons 1 and 2 incorporated episodes where various environmental themes were touched upon including littering, recycling, and water and energy conservation; however in the upcoming seasons these environmental issues comprise an important and significant component. In addition to the TV series, Pioneers develop supporting educational materials such as storybooks, DVDs, puzzles and board games, and provide training for teachers on the use of these materials with pupils. An added module to Hikyata Simsim TV series and materials is the 'Walk Around' program where Sesame characters visit various geographical locations to perform to children live and stimulate an interactive discussion on topics explored through the TV series. In the past 'Walk Around' shows have focused on road safety, mutual respect and understanding, and water conservation. For season 3, environmental awareness will be tackled to a large extent and audiences will be stimulated to recognize and identify behaviors that affect the environment, and to separate between positive and negatively impacting behaviors To date, 20 funded Walk Around shows have been implemented and 8 paid shows to private schools.

The show's strengths are in its methodology, as contrary to various other learning mediums that Jordanian children are exposed to, Hikayat Simsim encourages children to learn through play, humor and doing. Although Hikayat Simsim was adapted from the original Sesame Street show, the Arabized version presents topics through the lens of Jordanian social and art culture, and has incorporated additional characters that Jordanian children can identify with closely.

Challenges to the TV series are that it is hard to estimate how many viewers the show receives and which children the show is outreaching to. Furthermore the Walk Around shows, though very successful and have a huge attendance of 200-300 children per show, are very limited in range as funding for these is scarce and the Walk Around team undersized, therefore creating a challenge in outreaching to as large a percentage of children populations as is hoped for by the show's staff.

However Hikayat Simsim and accompanying programs can present a stimulating opportunity for children to learn in a more fun and interactive environment.

Rubicon

Rubicon is a Jordanian-based company that has successfully contended with a thriving world market in state-of-art electronic education, animation and training tools. Rubicon's services go across the board from themed entertainment for children to e-business skills courses for various companies. Rubicon is also a hub for animation in the region and hosts the largest team of animators in the Middle East and North Africa. Along with animators, Rubicon employs a team of education specialists and researchers to ensure e-learning tools and mediums are a meaningful learning experience that is interactive and enjoyable for learners to use.

In the field of animation, Rubicon's studios have developed several interactive media, 2-D and 3-D animations aimed at school-aged children, and which carry messages of tolerance and cross-cultural understanding. The company has received international recognition and several awards for their achievements in this field.

As pertaining to formal education for young people, although Rubicon does not work directly with end-users, they have worked extensively with education providers to develop and create e-learning tools or 'e-curricula' based on international standards and the latest educational technologies to complement formal curricula. Rubicon's pedagogical approach is to promote a new digital learning methodology that can prepare students to participate actively and confidently in a new economy, and to support their learning process where there is usually some difficulty. This is achieved by developing tools that are highly learner-centered that depend on the active participation of the learner, but also create an innovative and entertaining way to learn the subject and develop technological skills simultaneously. In addition to tool development, educators and teachers are trained to use these technologies as well as trained to support and encourage the use of these amongst students. The expected result is an enhanced interaction and more fruitful exchange between learner and educator around the subject matter presented in the classroom.

Rubicon's largest clients so far have been Ministries of Education in four different Arab countries, including Jordan's MOE. Based on the Ministry's request and requirements to improve approaches to teaching and increase academic achievement, Rubicon has effectively developed a supporting e-learning program to compliment the mathematics and science study lessons in Jordan's formal education curriculum. The e-Math and e-Science tools comprise of well-devised and structured study lessons that can aid teachers; demonstrative illustrations to support theoretical concepts; interactive media to help students apply concepts learned; and e-Tools which provide an experiential learning opportunity where students are encouraged to experiment and explore a variety of outcomes. These methodologies used together strengthen the student's understanding and application of concepts, as well as encourage exploratory learning. The tools are also designed in such a way to suit students of various levels of achievement and backgrounds.

The above e-learning tools can be accessed simply through computer station labs at schools, which are directly linked to the Ministry's intra-net, where specific study lessons can be accessed.

Rubicon also participated in a national campaign- 'The Water Efficiency' program- developed by several partners including the Ministry of Education, USAID and other donors, to produce supportive brochures and banners to spread awareness of the value of water, and conservation practices.

Rubicon can provide an opportunity for young people to experience learning through different digital and innovative media; however the issue of accessibility remains debatable. Although we would expect

Internet access to be readily available to children and young people, this is still not the case across huge populations of Jordanian youth. E-curricula and other creative learning media at schools while presenting high prospects, the problem of insufficient facilities to support e-curricula learning still exist, and catering to all students and all schools equally remains highly challenging.

4.3 Interview Findings and Recommendations

Generally our meetings with staff and directors from the above-reviewed organizations revealed that the three environmental themes of this study were not necessarily regarded as priority educational concepts and funding for such work was expressed by many as scarce.

Most individuals interviewed, whether regular staff or directors of programs, expressed an interest in contributing to environmental activity in Jordan, yet had minimal involvement in existing environmental work. Where efforts were initiated and carried out they were mostly around water issues which seemed to take precedence over concern for energy resources or waste management. Hence there is yet to be more work developed regarding scarcity of energy resources and its relation to water concepts. Education around waste management was surprisingly perceived by most as a futile effort to initiate with children.

All interviewees considered young people to be the key target group through which to initiate change, but recogized that Jordanian youth are still greatly influenced by many traditional factors including familial pressures and customs of showing respect for wisdom of their elders (including educators). Respondents perceived that these influential figures also needed knowledge to model positive environmental responsibility themselves and to set examples, in order for cultural change to be more easily attainable.

Environmental activities remain quite few, are not comprehensive in scope, and in no way given priority over other issues. Most respondents sensed that the formal education system had a larger role to play, expressing that current pedagogical approaches lacked practical application of theoretical concepts, and that formal educators themselves were not necessarily knowledgeable or skilled enough to serve as role-models and to validate the messages children are being taught. Respondents believed it was imperative that the formal education sector provide environmental education curricula to all equally; a curriculum that was more clearly identified, and more practical in its approach, yet also more relevant to Jordanian youth's experiences. Reinforcing lessons through extracurricular activities was also suggested by respondents.

In general, all respondents felt the government's role was a preliminary one prior to citizen responsibility. They perceived it was the role of the government to provide the necessary infrastructure, facilities and incentive to motivate people to develop positive environmental ethics and responsibility towards their communities and to take part in positive behaviors Two recurring examples given were the need for more trash bins on a single street prior to encouraging citizens to separate waste and engage in recycling activities; and maintaining water pipes regularly, rather than leaving them to breaking point and leaking for days, sometimes weeks, with clean running water being wasted. Respondents felt this was irresponsible behavior on behalf of the government and would not be helpful in motivating citizens to take responsibility.

When asked if their organizations had a role to play also, all interviewees recognized the value and importance of environmental work achieved by others and felt that it was essential to continue contributing to environmental awareness and education. They felt it equally important for stakeholders to join their efforts and develop a meaningful and effective network of partners that would work

together towards a common goal and measurable outcomes. There was a sense that communication was missing between the various sectors and therefore jeopardizing the effectiveness of programs and their outreach. Interviewees expressed that currently stakeholders had no knowledge of other organizations' contributions or scope of work which they believed was creating an overlap of work and a more fragmented approach, therefore achieving very little results in terms of outreach and impact.

Although some of these organizations had clearer educational objectives attached to their activities and services and many of the programs seemed to engage young people interactively with the concepts, there were no impact assessments carried out to gage the effectiveness of any of these programs. In theory these programs had great potential to affect young people's attitudes and behaviors, but little remains known about how concepts learned were applied practically in young people's daily lives.

In terms of content, many of the programs targeted only specific environmental themes, focusing mostly on water. There are fewer programs addressing waste management, and even fewer addressing the scarcity of energy resources and importance of conservation. Another visible setback in light of the Public Action for Water, Energy and Environment Project's goals is the lack of connection between the three themes relevant to this study. Staff approached environmental concepts related to their work from a narrow angle rarely connecting their role to the greater future environmental picture for Jordan. There was very little understanding of the severity and implications of energy resource scarcity, problems related to waste management and their relation to water resources. Furthermore, environmental problems were not seen as a holistic problem and most did not recognize nor promote sustainable ways of living among a shared strong ethical foundation that they modeled to their target population.

Another challenge to the effectiveness of these programs was funding opportunities which have also impacted their sustainability. Funding for environmental education was expressed by many as modest and so created a competitive dynamic between stakeholders to secure it. With the absence of a common vision, different overlapping messages have been sent to the children and youth. This is evident in the vast number of characters that represent the water droplet.

Many also expressed that funding strategies and timelines oftentimes jeopardized the sustainability of programs. Interviewees felt donors should allocate funds in a more dispersed manner while encouraging a methodology of building partnership between stakeholders to ensure services are diverse and far-reaching, but are also geared towards the same objectives with measurable outcomes. They added that partnerships including task-force teams and committees would further guarantee the success of programs and make certain that each organization was contributing a unique outlook and therefore working more efficiently within a holistic approach. However, currently organizations seem to change their work focus based on the amount of funding they receive. Most acted as subcontractors to many donor agencies aligning their mandates to amount of funding received. The threat of such an approach is the lack of sustainability of programs beyond the life of the project which has been observed previously in the programs of WEPIA.

Finally, many of the staff also took the opportunity to express their own concerns as individuals, revealing their sense of responsibility and willingness to practice further 'green' behaviors They engaged with the questions as concerned citizens as well, which created a genuine expression and dialogue around further development needed to take place for Jordan and its citizens to move forward towards becoming a green society.

5.0 Assessing Gaps

5.1 Youth in-depth Interviews

Throughout the survey process, a number of youths were found to be well-versed on environmental issues and proved to be more actively involved in environmental activity than many of their peers. These young people had stronger opinions towards environmental issues and expressed an active interest in partaking in positive environmental practices.

Where youths were found to be actively concerned and engaged in environmental issues, it was also evident that these youths came from mostly upper and middle socio-economic backgrounds and had access to more information and participation opportunities than did those from lower socioeconomic backgrounds. The findings detailed below reveal some insight into the sources of this knowledge and the opportunities these youth had access to which made learning and involvement possible.

It was found that three key factors influenced the level of awareness and engagement of these young people.

First, participation was an important factor differentiating these young people from their peers. Many of these youths had previously participated in environmentally-related activities. They ranged from partaking in recycling efforts, to planning and implementing environmental projects, participating in environmental competitions, and even being part of environmental committees. While the activities and the learning involved varied, the element found to be common between these activities was their participatory and experiential nature. Many youth respondents included in our wider sample disclosed broad and varied knowledge of environmental issues but did not share the genuine concern witnessed in youth who had participated in hands-on learning.

A second factor found to be quite influential in changing young people's attitudes and practices, and was also found to be a common feature linking many environmentally-conscious youth, is the presence of individuals or significant others in their surroundings who exhibited positive environmental attitudes and practices. Most influential were parents, but peers and in some instances neighbors also had an impact. These persons seemed to be active role models in the young people's lives, and their relationships with them heightened their understanding of the value of the environment and sense of responsibility towards its protection.

A final factor found to affect some of these young people's attitudes was their contact with cultures and societies where environmental practices were observed on a daily basis and citizens were seen to take individual action to reduce their negative impact on the environment. Some examples are the availability of recycling bins; encouraging the use of re-usable bags; electricity-saving devices and low CO2-emission electrical appliances. Many of these youths had traveled abroad to more developed countries where they were exposed to proactive attitudes and 'green' consumer practices geared towards environmental protection and conservation.

The abundance of environmental services and public action in these developed nations required our young respondents to also take part in environmentally-friendly practices, and through practice they were inevitably compelled to recognize and learn of human impact on the environment and become involved in a way of life where positive environmental attitudes and behaviors are embedded within a culture.

Despite differences between respondents of different socioeconomic backgrounds mentioned above, most young respondents included in the survey, when asked what would encourage their involvement in environmental activities noted that participating in live events, visits to sites, and observing others in their communities taking part in positive environmental behaviors would be of most value to them. Other suggestions for participation included workshops, lectures, competitions, Internet forums, and retreats involving youth in meaningful environmental projects with visible results. Yet although such opportunities for participation were found to be lacking generally, they were more so for youths from lower socio-economic backgrounds. There is a distinct need to outreach specifically to these young people through participatory learning to influence attitudes and modify behaviors

An interesting note to add here which may validate the significance of participation on attitudes, was the impact our focus group discussions alone had on many of the young participants. Although respondents initially seemed to display more rigid attitudes, it was eventually apparent that discussions between respondents revealed more flexible positions and a willingness to change. Many youths approached the research team following the discussions to request further involvement and to express the profound effect the discussions had on their environmental perspective. It was evident that discussions triggered a sense or need to understand the environment more thoroughly and partake in contributing to its protection. A response of this kind from youth reveals the level to which there is lack in participatory opportunities open to young people. It equally reflects a crucial need for developing feasible projects and venues to engage youth in meaningful learning that will make a difference on their own attitudes and behaviors in the long run.

5.2 Gaps in the field

This section will provide an assessment of the adequacy and efficiency of the resources discussed in Section 4, and will highlight priority areas for improvement and development in Public Action for Water, Energy and Environment Project's initiation and progression.

Although there exists a broad variety of resources, these are still minimal, fragmented and do not make part of a holistic vision and approach to environmental education in Jordan. Many resources in some instances were irrelevant to the Jordanian experience and if relevant oftentimes presented a challenge with accessibility.

Regarding retail-based resources-whether books, toys or media learning materials- many of these presented a key challenge in terms of accessibility to the general public, simply by being presented in the English Language and not Arabic. This is a major deterring factor for local communities and young people, as such resources are immediately deemed irrelevant in Jordanian context. Where some resources were found in the Arabic language- for example Haya center's collection of environmental materials- these were not disseminated widely enough to become readily available and effective.

Geographic accessibility is another challenge common to both retail-based and organizational-based resources such as programs, events, and educational tools. Most opportunities for acquiring information (libraries, bookshops) and participation (lectures, films, programs) are located in West Amman and therefore are more readily available and accessible to residents of those areas. There is a bigger need to target populations in more underprivileged communities in the outskirts of the city and other geographical locations, though these populations receive little prospects for involvement. Resources and

programs are also not promoted sufficiently to encourage wider youth populations to take part. This could be addressed by initiating community and youth-led projects in these areas through community organizations, which can engage members more personally and frequently in a meaningful context.

In two instances only, we observed outreach efforts that reached more remote communities, namely Sesame street's 'Walk-Around' sessions and PAC's mobile puppet show, 'Qatrat Ma'. These shows have reached out to populations and local communities in need of further intervention, adapting the relevance of the shows to the local community in question. The programs are ongoing however their frequency remains limited as funding to secure shows is also a challenge. The issue of accessibility of resources is therefore an important matter to concern ourselves with.

Regarding approaches and methodologies of outreach, most resources and programs reviewed although youth-focused in nature were not necessarily youth-led and a certain interactive and participatory element was lacking. Whilst youth-focused resources are necessary to create a knowledge base, youth-led initiatives where young people can be involved in initiating, organizing and implementing projects are more effective in developing young people's practical knowledge, experience and relationships with their community members and the environment. Through this study it was evident that youths that have been exposed to participatory learning and peer-led opportunities were found to be more environmentally responsible and active. Such programs if developed can be effective in impacting youth's attitudes and practices, and disseminating an environmentally-responsible culture amongst youth in Jordan. Currently there are few such opportunities for young people as expressed by youth themselves, and little is known amongst staff of the prevalence of such programs.

There continues to be an absence of informal relationships with young people, and informal/non-formal sector staff and educators continue to encompass a certain formality in their relationships with youth. This in some instances discourages young people's intuitive and participation. Educators are still perceived to hold superior positions and democratic processes where young people's views and opinions are equally valued remain somewhat lacking. Additionally, with the pressure to reach numerical targets and produce reports to donors; relationships and processes can also be easily neglected. It is important to tackle this issue through relevant training, to raise the awareness of educators around the significant role they play in disseminating messages, modeling environmentally positive behaviors and ensuring the success of their programs.

Finally, a key missing building block is the absence of laws, regulations, facilities, and services which will encourage citizens, whether staff or young people to take a more active interest in environmental issues related to Jordan. It is important that relevant governmental departments take measures to inform citizens more proactively through ad campaigns, and efficient services and facilities that will motivate and reinforce positive environmental behavior individually or communally.

A more recent approach towards education for a sustainable way of life was translated into the Earth Charter (www.earthcharterinaction.org). This is a declaration of fundamental ethical principles for building a just, sustainable and peaceful global society. The advantage of focusing on ethics is that these instill values that would remain with children and youth beyond the life of this project.

6.0 RECOMMENDATIONS:

Proposed Developments for Informal Environmental Education and Ethics

Throughout this study, young people, staff, and program directors have provided a wealth of information and feedback leading to these recommendations regarding environmental initiatives, training and forms of communication. It is clear that there is a need for more 'green' programs that involve youth in a proactive way. It cannot be assumed that young people will conserve or recycle on their own without modeling, guidance and support. Programs targeting youth need to remain positive, dynamic, and in context. Programs need to include an ethical component that targets educators, children and youth.

These recommendations in no way encompass all there is to develop a greener Jordan. However they do represent potential based on assessed need and current resources. The six recommendations included here were carefully prioritized based on survey results. If some of these opportunities are used to their full potential, they can effectively reinforce learning and gradually introduce an environmentally-friendly culture amongst young people that can continue to grow.

Developing environmental Resources in the Arabic language:
It was evident throughout the review on retail-based resources that many are scattered, inappropriate to the general public, and difficult to access. Even when resources were found they were either based in geographic locations where they were hard to reach by communities outside the West Amman areas, or they were not population specific, such as English, Indian and Chinese resources.

The resources currently available are not stimulating enough and lack certain attractiveness, and therefore children do not gain a passion for reading and learning about the environment. These children grow up as non-learners and do not have enough understanding of current environmental issues in their region. It is recommended that resources in the Arabic language are developed that present concepts in a colorful, child-friendly and attractive style. These resources would also focus on promoting curiosity, critical thinking, and creativity, the aim of which is developing a culture of environmental responsibility amongst children and youth based on sound understanding and knowledge.

Develop youth-led and peer-led programs that involve participatory learning approaches:
Young people expressed a need to participate in more hands-on experiences, stating that currently there were no real opportunities for them to participate. They also expressed they have a lot of free time which they didn't know what to do with, and would appreciate filling their time with productive activities where learning and contributing new things was possible.

Experiential environmental projects can be developed through which youth can develop, lead, and implement projects with their peers from different backgrounds to disseminate messages, share experiences, and learn about relevant environmental concepts creatively and directly through experience. This can be achieved through employing a range of activities, from workshops, lectures, the arts, field visits and retreats. Young people who are knowledgeable and passionate about the environment can be encouraged to lead programs; where they can learn new skills and also promote an understanding of the challenges and implications of non-sustainable behaviors amongst their peers. Such programs can effectively develop a culture of environmental responsibility and a generation of youth who are proactive towards the environment.

To set up such programs it may be important to found a venue through which young people can operate, supported by a team of skilled staff and youth workers. Projects can be publicized and promoted though online social media groups and networks such as Facebook, which was found to be immensely popular. Other existing projects and community-based organizations serving target youth populations and local communities can also be identified as potential venues for operating such

programs, such as the 'Youth: Work Jordan project' lead by four prominent NGO's in Jordan. "We are All Jordan" is another prospective venue for youth participation.

Create an environmental education task-force of skilled youth workers, teachers and staff working consistently with youth: Developing a national task-force of institutions, educators, and youth workers working together towards a unified vision for environmental education in Jordan, would ensure partners work together closely towards a common purpose. An essential component of making the partnership a success is training informal/non-formal educators. For programs to reach youth effectively it is important to focus on raising the knowledge skills and experience of staff working consistently with young people.

There is a need to train youth workers and informal educators on the value of developing meaningful relationships with young people that can encourage their motivation, participation and faith in the experiences they take part in. Training courses on the "Earth Charter" agreement in order to ensure youth engagement and positive environmental responsibility can be provided to staff working closely with youth to ensure program effectiveness and success, by modeling ethical environmental behaviors An ethical framework is being developed by "Biosphere Ethics Group" under the supervision of the IUCN. This ethical framework could be translated into an environmental code of ethics and delivered to staff, educators, teachers and general public.

Develop the Haya Cultural Center and Children's Museum as venues for learning about the environment:
The Haya Cultural Center is currently renovating and redecorating their main facility entirely, and funding has already been allocated by her Royal Highness Princess Haya to complete this work. The center's director and staff showed great interest in developing a green museum section, where children can learn about Jordan's unique environmental challenges interactively through exhibits, participation and hands-on learning.

To differentiate its museum from the Children's Museum, the Haya Cultural Center could be a model "Green Building Museum" utilizing the expertise of the Jordan Green Building Council to design and renovate the space. The exhibits can be created interactively utilizing the arts and re-use of waste materials, and involving youth in its creation, with the assistance of its talented staff. This will encourage interactive learning through play, exploration, and simultaneously transmit environmental messages. Involving youth directly in building exhibits also develops a sense of ownership which will distinguish this space from the Children's Museum, making it an experimental site for learning while promoting the arts and creativity. A similar approach has been used in creating the City Museum in St. Louis Missouri (http://www.citymuseum.org/home.asp).

The Children's Museum has also proven to be an effective venue through which to reach children using interactive and experiential play. However there is a need to redevelop the Energy Lab to raise its popularity and encompass concepts that are relevant. This means introducing new environmental exhibits that involve more interactive learning (e.g. role play) to teach environmental themes; while also utilizing sound or animation pop-ups to demonstrate the use of the exhibits (instead of current textual explanations). We found that when unattended to by adults, children mishandled exhibits and found difficulty in appreciating the learning involved. It is important for the museum's management to consider increasing staff to include knowledgeable exhibit assistants, who can skilfully and playfully support children in using the exhibits and making sense of the learning.

Develop and produce a National Geographic (Abu Dhabi) documentary showcasing Jordan's particular environmental challenges:

Television was unexpectedly still a popular and even preferred medium of acquiring information for many youth included in the survey, and more so with youth from lower socio-economic backgrounds, which make up the majority of Jordan's youth population.

National Geographic (Abu Dhabi) was surprisingly found to be the most popular TV channel (1 in every 3 youths actively viewed it) for acquiring information around environmental issues. It was found to have been quite influential in developing many young people's knowledge and ideas around global environmental challenges and ways that other nations are addressing these. National Geographic is also specialized in presenting a very broad range of environmental issues. Young respondents gave examples of Japan, Italy, Germany and Brazil, describing environmental protection and conservation practices in careful detail. This reveals the level to which such programs have had an impact on their awareness of the issues presented.

It may be important to consider working closely with National Geographic AD to produce a special program addressing Jordan's particular environmental challenges. Jordan has a growing film industry with talented film-makers and film can potentially prove an effective method of revealing the severity of Jordan's resource scarcity, presenting perspectives of officials, specialists and scientists; and presenting expected projections of Jordan's future environment with increase in population, economic development, and the consequences of current practices. Working with National Geographic AD to develop such a documentary film may present an effective way of reaching an increased youth viewership; illustrating the magnitude of the problem; and instilling a sense of individual concern and responsibility towards conservation and protection.

Developing social media tools to raise interests, awareness, and reinforce learning:
With the proliferation of Internet use in Jordan, the Internet represents a key medium to transmit environmental messages. Many young people from various socio-economic backgrounds included in the study were found to be active internet users. Though the use of the Internet as a source of knowledge and information decreased with a decrease in social class, surprisingly youth from all socioeconomic backgrounds seemed to actively use social networking sites.

The creation of informational sites may only target a slim portion of the population seeing as most youth enjoy the more interactive features of the Internet. Conversely, using social networking sites to advertise events, create Facebook groups on environmental topics, or develop online game applications to transmit knowledge on environmental issues as well as portray positive environmental attitudes and behaviors, will reach a much larger portion of the Jordanian youth population. Youth were found to value highly the social aspects of Internet surfing, and so incorporating a social aspect to any Internet project is vital for its success.

For instance, Farmville, a popular Facebook application with over 81 million active users, allows users to create farms, plant and harvest crops, expand plots, and tend to livestock. In addition to caring for the farm, users can invite Facebook friends to become neighbors and advance in level throughout the game. One in every five youths surveyed in our study was an active user of Facebook game applications.

The Farmville model could prove to be a valuable approach in disseminating environmental messages and engaging youth in environmental issues interactively through play. Its outreach scope is vast and can effectively transmit subtle messages. Developing a Facebook application on the environment, which involves social networking as an active form of learning, and allows users to communicate via avatars with other friends, is worth looking into as an effective outreach medium.

Note: Refer to the following link for a list of top ten most visited Internet sites for Jordan on Alexa:
http://www.alexa.com/topsites/countries/JO

Develop university courses and electives to promote environmental awareness:
Throughout the research process it was evident that youth who are still enrolled in their final school years, or had recently graduated from school showed a greater degree of knowledge than many of their older peers enrolled in universities or colleges. It seems upon graduation from secondary school while young people sense they are preparing for a completely new chapter in their lives, scholastic information is quickly deemed useless and therefore easily forgotten. It may be important to introduce a general environmental ethics course at universities and colleges which can serve as a knowledge continuum post school years, while focusing on Jordan's unique environmental challenges. This can be provided either as an elective or mandatory course, reinforcing a continuation of the knowledge base already acquired through elementary and secondary school, and supported by practicum modules to make it more stimulating and engaging for students. Currently we only know of one such course, an elective at Zaitounah Private University; however we could not obtain the course syllabus to explore its components.

As university students are more independent and active on campus as compared with their younger peers, it may also be important to provide a separate venue (than a classroom) on campus through which the course can be carried out. Although school interventions around environmental education are currently higher than university interventions, the potential for university students to create a change is more viable.

7.0 ANNEXES

7.1 Annex A: Breakdown of FG sample

Level	Age	Gender	Educational level	Income
Underpriveleged Class	20	F	High school	<300
	23	F	BA degree	<300
	24	F	High school	<300
	21	F	High school	<300
	17	F	High school	<300
	23	M	High school	<300
	22	M	High school	<300
	19	M	High school	<300
	20	M	High school	<300
	16	M	High school	<300
	18	M	High school	<300

	18	M	BA degree	<300
	27	F	BA degree	<300
	23	F	BA degree	<300
	20	M	High school	<300
	26	M	High school	<300
	25	M	High school	<300
	23	M	High school	<300
	21	M	High school	<300
	24	M	High school	<300
	19	F	High school	<300
	21	F	BA degree	<300
	17	M	High school	<300
Lower Class	22	F	BA degree	300-500
	16	F	High school	300-500
	15	F	High school	300-500
	16	F	High school	300-500
	18	F	High school	300-500
	20	M	BA degree	300-500
	19	M	High school	300-500
	20	M	BA degree	300-500
	21	M	High school	300-500
	20	M	BA degree	300-500
	19	M	High school	300-500
	18	M	High school	300-500
	19	M	High school	300-500
	17	M	High school	300-500
	19	M	High school	300-500
	19	M	High school	300-500
	21	M	BA degree	300-500
	22	M	High school	300-500
	20	M	BA degree	300-500
	24	M	BA degree	300-500
		M	BA degree	300-500

Level	Age	Gender	Educational level	Income

Lower- Middle Class	24	M	BA degree	500-1000
	23	F	BA degree	500-1000
	23	F	BA degree	500-1000
	17	M	High school	500-1000
	18	M	High school	500-1000
Upper+Upper Middle Class	21	M	High school	>1000
	16	M	High school	>1000
	21	F	BA degree	>1000
	20	M	BA degree	>1000
	21	M	BA degree	>1000
	22	M	BA degree	>1000
	23	F	BA degree	>1000
	22	M	Master degree	>1000
	23	F	BA degree	>1000
	21	F	BA degree	>1000

7.2 Annex B: Public Action for Water, Energy, and Environment Project Informal/Non-formal Contact List

Informal Sector Contacts				
Institution	**Contact person/s**	**Position/Title**	**Telephone no.**	**Email address**
Royal Film Commission	Rula Nasser	Capacity Building Department Operations Manager	06-4613835	Rula.nasser@film.jo
	Nada Doomani	Communications Manager	06-4642266 (Ext. 17)	
	Nadia 'Alaiwat	Mentor- RFC Deir Al-Sa'eed girl's group	0795621437	
Rubicon	Eman Al-Khalidi		4655400/300	Eman.alkhaldi@rubicon.com.jo
Puppet Show (NCCPA)	Muhannad Nawafleh	Director of Cultural Programs	5690292/3	Muhannad.nawafleh@pac.org.jo
Sesame Street-Pioneers	Reem Zada	Director of Content and Research	06-5922051/158 078-8741045	reem@jordanpioneers.com
	Khaled Haddad	Executive Producer/General Manager	079-5529301	Khaled@jordanpioneers.com
Social Media – Active Youth	Nour Bataineh		077-7224522	
Johud (Jordanian Hashemite Fund for Human Development)			06-5515950	
Jordan Media City			06-5502700	
Jordan Career Education Foundation	Afnan Hadidi		077-7806681	
Miyahuna (Ministry of Water)	Haala Dahlan		079-5924719	
	Jumana Al-'Ayid		0799222771	
Jordan Environment Society (JES)	Safaa' Al-Jayyousi		06-5699844	
Bookshops				
LKD Educational	Levon K.Desarkissian	Chairman of the Board	06-5816593/4 079-5560517	customerservice@lkd.com.jo levon@lkdgroup.com
Jordan Book Center			06-5151882	info@jbc.com.jo
Sharabi			06-534-5711	
Toy Stores				
Hamleys			06-5515020	
Toys and Toys			06-586-2622	Info@toysandtoys.jo
Mikhi			06-4652306/8592	
Youth				
	Rakan Al-Hadawi (M)		079-9455779	
	Mahdi Abu Assi (M)		079-6868191	
	Faisal Hussain (M)		079-9787753	

	Ahmad Isbaitan (M)		078-6108628	
	Amer Sa'eed (M)		078-6761205	
	Mohammad Mustafa (M)		078-8870176	
	Hanan Ali 'Ateeyeh (F Unemployed) Haneen Ali 'Ateeyeh Ayah Majid Al-Jawhari (F Unemployed)		079-9718103	
	Do'aa 'Asim Al-Husayni (F Unemployed)		06-4921134	
	Wijdan Khalil Al-Darawsheh (F Unemployed)		078-6725995	
	Sahar Ziyad Al-Qabali (F Unemployed)		06-4902939	
	Majd Mahmoud Al-Nawafleh (F Unemployed)		078-8259817	
	Hadeel Nabil Al-'Ulbi (F Unemployed)		078-5169271	
	Zein Hisham Matour (F Employed)		079-6560544	
	Rawan 'Aydah (F Employed)		079-6068056	
	Alaa' Nabil Al-Sayid (F Employed)		078-8035320	
	Hiba Al-'Abid (F Employed)		078-8258431	
	Mohammad Bassem Tawfiq Abu Sa'deh (M Employed)		078-5386056	
	Hana' Jum'ah (Madrasati Volunteer)		077-9181174	
	Osama Kan'an (Madrasati Volunteer)		077-9181172	
	Zena Al-Kurd (Madrasati Volunteer)		079-9767225	
	Ala' Baghdadi (Madrasati Volunteer)		077-7448989	
	Samer Al-Ra'I		079-6873366	

	Madrasati Volunteer)			
	Nader Abd Al-Hadi (Madrasati Volunteer)		077-7436643	
Social Media				
	Nour Batayneh		077-7224522	
	Anslem Ibing	Recycling Program	077-9030297	anslem@entitygreen.com
Non-formal Sector Contacts				
Institution	**Contact person/s**	**Position/Title**	**Telephone no.**	**Email address**
Haya Cultural Center	Sahab	Director General	077-6301757	
Children's Museum	Ayah Younis			ayah@cmj.jo
	Ibrahim Hawamdeh	Educational Supervisor	077-9563700	Ibrahim.hawamdeh@cmj.jo
	Shereen Sabanikh	Education and Programs Manager	079-9595444	Shireen.sabanegh@cmj.jop
Nature Clubs (also formal sector)	Manhal Zreikat		0777-470446	

7.3 Annex C: Summary of field work

Field work		Male	Female
Youth Focus Group Breakdown			
	Upper Class	2	3
	Middle-Upper Class	3	4
	Middle-lower Class	6	5
	Lower Class	16	7
	Deprived/underprivileged	13	10
	Public Spaces FGs	4	0
	Haya Cultural Center FGs	15	15

Total Male= 59
Total female= 44
Total Focus Group Participants= 103

Youth FGs by Employment Status	Employed		Unemployed	
	Male	Female	Male	Female
Lower class	16	7	10	0
Deprived/underprivileged	13	0	0	10

Total Employed Youth FG Participants= 36
Total Unemployed Youth FG Participants= 20

Interviews	Male	Female
Phone Interviews*= 16	6	10
Semi-structured Interviews= 10	4	6
Children's Museum Interviews= 32	20	12

Total Youth Interviews= 58

TOTAL YOUTH SAMPLE SIZE= 145
TOTAL Male= 83

TOTAL Female= 62		
Institutions		
	Total Field Visits= 16	
	Total Institution Staff Interviews= 13	

*Phone interviewees were not counted as part of the total youth sample as interviewees were already included in the above focus group tally

7.4 Annex D: Summary of findings

	Knowledge	Attitudes	Behaviors	Influential Sources of Information	Prospective Mediums to Develop Active Environmental Responsibility	Additional Notes
Upper and Upper-Middle Class	• Advanced and holistic environmental knowledge • High solid waste management awareness (3Rs) • Lack of awareness of severity of water issue in Jordan • No awareness of energy shortage problems in Jordan	• Positive solid waste management attitudes • Sense of individual responsibility towards the environment, irrespective of government effort/intervention • There was a sense that individual water use was acceptable • High environmental ethics	• Some energy conservation practices • Some solid waste reduction, and re-use practices	• Internet • Being exposed to societies and cultures with embedded environmental practices	• Youth-led/peer-led programs • Social media networking • University courses and events	If facilities were present, this group would willingly participate in recycling.
Middle Class	• Identified more so with global environmental problems than with local problems • Adequate knowledge on three themes • Advanced knowledge on water issues • Little knowledge on electricity-generating resources • Developed awareness of solid waste management and adequate knowledge of collection and sorting	• Low feeling of concern to conserve energy, any conservation practices were based on financial reasons • There was a sense that individual water use was acceptable • Strong anti-littering sentiments • Recognized both the role of the government and the individual in addressing environmental problems	• High energy conservation practices (higher than water conservation practices) • Practice anti-littering	• Television • Internet	• Youth-led /peer-led programs • Social Media Networking • University courses and events	If facilities were present, this group would willingly participate in recycling.

Lower Class	• Well-rounded knowledge on global and local environmental issues (sometimes informed by experiences and area of residence) • Vast knowledge on water and energy • Little knowledge on Jordan's main electricity-generating energy resource. • Little knowledge of concepts of waste re-use and reduction • Some knowledge of recycling concepts.	• Positive attitudes towards water and energy conservation-informed by religious beliefs to a big degree • Strong anti-littering sentiments • Concepts of water and air pollution understood to a big degree due to personal experience, and hence impacted positive environmental perspectives • Strong sense that government should be playing a bigger role than the individual in addressing environmental problems.	• Water and energy conservation practices prevalent for religious and financial reasons • No reduction or re-use practices	• Personal experiences • Satellite Television • Minimal internet use	• Youth-led/peer-led programs • Local community-based projects/events/lectures • Television programs	If alternatives and facilities were present, this group would willingly participate in re-use, reduction and recycling.
Underprivileged and Deprived	• Awareness was minimal on all three survey themes • Other issues took precedence over the environment	• Strong anti-littering sentiments due to personal experience • Negative attitudes towards the government • The environment is seen as solely the responsibility of the government • Triviality of environmental problems as compared with other social problems (unemployment/pover	• Some water conservation practices due to water shortages • Prevalent energy practices motivated by financial pressures	• Satellite television	• Youth-led/peer-led programs • Local community-based projects/events/lectures • Television programs	

		ty) • Strong sense of injustice and inequality				

7.5 Annex E: Table of resources

Institution	Resource	Description	Notes
Children's Museum	• Energy Lab Exhibit • Ecosystem Exhibit • Reusable products in the Art Studio • Summer and Winter Camps for various activities (these can be used for environmental education)	The Energy Lab includes concepts on electricity, energy creation through kinetic energy, solar powered energy; the water cycle, water use and water conservation; recycling, and waste management,	- The Energy Lab is in an isolated corner of the museum; exhibits are not as interactive, maintenance activity is irregular; absence of assistants
Miyahuna	• Pamphlets sent out with each water bill including important awareness information • School Kit	The school kit is part of an awareness campaign led by Miyahuna. Miyahuna visits public and private schools, presents lectures on water issues, and hands out school kits to children. Kits include a storybook on water conservation, a backpack, a colouring book, coloured pencils, a water violation ticket booklet, a t-shirt, and a hat.	
The Royal Film Commission	Local documentaries related to the environment: • The Man in Orange (written, filmed and produced by youth) • The Last Drop (written, filmed and produced by youth) • What is Recycling? (written filmed and produced by youth) • Desperate Neighbors • Ramim- Documentary film • Plastic Bags International documentaries shown in environment week: • Here Comes the Sun	The RFC has several documentaries made by local Jordanians. It also has international documentaries that it screened on environmental week	

	• No Impact Man • The Age of Stupid • Home		
Jordan Pioneers (Sesame Street)	• Sesame Street (Hikayat Simsim) TV Program • Walk Around Program • Educational materials for schools • Educational packets for children • Training workshops for educators	Some of the episodes cover environmental concepts such as recycling, keeping the environment clean, water and energy conservation, and planting. The Walk Around Program is an outreach program where live Sesame Street characters visit local communities and interact with young audiences around various themes covered in the TV series. The educational materials for schools include puzzles and board games. The educational packets for children include a storybook, a backpack, stickers, a DVD, and a small poster pamphlet. One packet has been produced to date and covers topics on sanitary workers, and keeping the environment clean.	200-300 children attend the Walk Around Program Performances.
Jordan Environmental Society	• Recycling project • Environmental Management Training (EMT) • Eco-Student program • Clean Up the World campaign • Bi-monthly environmental magazine	EMT- Training professionals and employees, small businesses on developing 'green' practices ECO-student provides training to MOE teachers on encouraging environmental practices with students The magazine has had two printed issues to date	
Haya Cultural Center	• Drive to Read Library	Contains various books relevant to the	

	• Talented and dedicated staff • Venue for developing programs and projects Note: Previous resources have been effective however these are no longer in use and have been exhausted.	survey themes Haya center is currently under renovation and management is open to new innovations and ideas. The venue could be developed into an interactive 'green' building and museum.	
Drive to Read	• Multiple books covering different environmental themes including volcanoes, oceans, coral reefs, and pollution • Books that cover the three relevant survey themes: - Part of "Silsilah Khadrah." - "Al-Muhafatheh Ala Al Beea" ("Protection of the Environment Series"): this book covers recycling, compost, solar power and other subjects. - "Ghassan Ya'raf Ma Huwa Al Talawuth" ("Ghassan understands what pollution is"): this book covers water and air pollution, and littering. - "Sadeeqina 'Amil Al-Nathafa" ("Our friend the sanitary worker"): on the value and contribution of sanitary workers towards the environment. The book also covers the re-use of waste to make crafts. -"Limatha Yajib 3alay an Usahim Fi		

	'Amaliyat Al-Tadweer?" ("Why I should participate in recycling?").		
NCCPA	• "Qatrit Maa'" (A Drop of Water) mobile puppet show	The puppet show covers issues of water scarcity and conservation, and uses an interactive approach. Young audiences are encouraged to interact with puppet characters to discuss themes presented in the show. The show visits schools and various other organizations working with children.	
LKD Educational	• Catalogues listing a variety of environmental materials are available in English. Materials however need to be ordered in advance.		Environmental material was not available onsite, as it was expressed other scholastic subject areas took precedence.
Jordan Book Center	• Young Encyclopedia: Exploring the Oceans, the Environment, The World's Weather • An average of 80 books, most of whic are college textbooks, some encyclopedias, and some directo		Most of the youth/adult books are mostl a theoretical nature and focus on geological perspectives- ve little application/utility of concepts in everyday life. A lot of the content was either outdated/old/ or in most cases irrelevan Jordan's experience. All resources were in the English language, and most resources found were of a very advanced level Only 15-30 individuals a year requested t see the environmental section- with visit mainly comprised of college students (studying environmental or water management studies) and some professionals. Only 50% or less of this

			group whether students or professionals actually purchased the books they brows through.
Sharabi Bookshop	• FUN-N-FACT- an informative colori book that looks at concepts of water pollution/waste/solar energy • "Don't Throw, Make": a book encour children to reuse waste materials to recreate toys and ot useful objects.		
Hamleys Toy Store	• DVDs: - Dive Olly Dive! - Happy Feet - Bee Movie - The Legend of Sasquatch • Toys: - Nature Explorer: a kit with two-v bug viewer, binoculars, a net, 5X bug viewer, ventilated wa tank with lid - Essential Paper Recycling Works! - Electromagnetic kit- an education set on how to transform energy (e.g. magnetic) to create electricity. - A game on how to use kinetic en (movement/propeller) to create energy to move objects, turn ligh on, etc…		

	- Enviro-Box: building/ creating shapes made out of bio-degrad material - Some games on bio-diversity-e.g. Animals, their habitats		
Toys & Toys			
Mikhi Toy Store	• A board game: "The Water Cycle" • "*Qatrat Maa"* (A drop of water) storybook	The Water Cycle is a race board game wi informative facts about the sources, uses stages of the water cycle-from evaporatic precipitation and uses. It was aimed at beginners and included other basic environmental science concepts, e.g. the sun's contribution to the water cycle. The story follows the journey of 3 raindrops and contains some informatior conserving, and 'saving' the raindrops. T resource was in Arabic.	