USAID FROM THE AMERICAN PEOPLE | JORDAN

PHASE I REPORT

IDENTIFICATION OF PRIORITIES FOR BEHAVIORAL CHANGE IN THE WATER, ENERGY AND ENVIRONMENT SECTOR

Public Action for Water, Energy and Environment Project

Prosperity, Livelihoods and Conserving Ecosystems (PLACE) IQC Task Order #5

July 2010

This report was produced for review by the United States Agency for International Development. It was prepared by ECODIT for **Public Action Project for Water, Energy and Environment project**, Task Order No. EPP-I-05-06-00010-00.

AUTHORITY

Prepared for USAID/Jordan under Prosperity, Livelihoods and Conserving Ecosystems (PLACE) Indefinite Quantity Contract number EPP-I-00-06-00010-00, Task Order #05, awarded 10 September 2009, entitled "Public Action for Water, Energy and Environment."

The *Phase I Report* is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of ECODIT and do not necessarily reflect the views of USAID or the United States Government.

Prepared by:

Public Action Project for Water, Energy and Environment Project

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

Although an effort was made to reduce the number of acronyms used in this text, many are commonly used and are included here – specifically donors, government institutions and commonly used technical terms. Whenever the acronym or abbreviation appears the first time it is defined in the text.

AED	Academy for Educational Development
ASEZA	Aqaba Special Economic Zone Authority
BMP	Best Management Practices
CBO	Community Based Organization
CMJ	Children's Museum of Jordan
EG	Entity Green
ERC	Electricity Regulatory Commission
GAM	Greater Amman Municipality
GOJ	Government of Jordan
GT	GreenTech Sustainable Environment
HCC	Haya Cultural Center
I*d*RC	Interdisciplinary Research Consultants
Jordan PAP	Jordan Public Action Project
LEED	Leadership in Energy and Environmental Design
MOE	Ministry of Environment
MOEd	Ministry of Education
MOEMR	Ministry of Energy and Mineral Resources
MOWI	Ministry of Water and Irrigation
MRO	Market Research Organization
NGO	Non-Governmental Organization
PLACE	Prosperity, Livelihoods and Conserving Ecosystems IQC
RSS	Royal Scientific Society
WOL	World of Letters

1. INTRODUCTION

The "Public Action for Water, Energy and Environment" Project (henceforth "PAP") is implemented by ECODIT under the Prosperity, Livelihoods and Conserving Ecosystems Indefinite Quantity Contract No. EPP-I-05-06-00010-00 (Task Order No. 05). The Academy for Educational Development (AED) is a core subcontractor on the ECODIT team.

The Jordan PAP project is a five year public education and behavior change program divided into three phases. Phase I is the data collection and assessment phase (9 months, ending July 31, 2010); Phase II is the participatory design phase (3 months ending October 31, 2010); and Phase III is the implementation phase (four years, ending August 31, 2014).

According to Section F.2 (Deliverables Schedule) of ECODIT's Task Order, the contractor is required to submit a Phase I Report ***that identifies the priorities for behavioral change in the water, energy and environment sector.*** To produce this report, the Jordan PAP team met with and interviewed dozens of Jordanian institutions, organizations and professionals; designed and managed more than a dozen surveys –*see list of surveys in Exhibit 1 overleaf*; and planned and organized several workshops and public consultations including a Kick-Off workshop in Amman (December 2009), two social marketing training workshops in Amman and the Dead Sea (April 2010), and a Report-Out workshop in the Dead Sea (July 2010). From the totality of these efforts, PAP will determine its direction and focus for behavioral change over the next four years, and develop the sequence for continued action and support by USAID in future years.

This report is organized into five chapters:

1. Introduction –*this chapter*
2. Analysis of Behaviors of Households
3. Analysis of Behaviors of Large Consumers
4. Analysis of Behaviors among Youth
5. Summary of Priority Behaviors

…and two annexes:

A. Summary of Survey Findings
B. Transcripts of Report-Out Workshop (Group Work, in Arabic)

Exhibit 1 – List of Jordan PAP Surveys and Research Activities Completed in Phase I

Report Number	*Report Title*	*Lead Author*	*Date Submitted To USAID*
1	NGOs & CBOs efforts on social marketing, outreach & communication	Sandra Chesrown in collaboration with Maha Dergham	May 5, 2009
2	KAP household – baseline survey	Marketing Research Organization (MRO)	May 5, 2009
3	Water and energy related interviews for large Jordanian consumers large consumers	Interdisciplinary Research Consultants & GreenTech Sustainable Environment	May 5, 2009
4	Government institutions in water, energy and environment	Patricia Hotchkiss Bakir	June 20, 2009
5	USAID and other donor efforts in outreach and communication	Patricia Hotchkiss Bakir	June 20, 2009
7	Young people's knowledge attitudes & behaviors on environmental issues: water & energy conservation & solid waste management informal & non formal sectors	World of Letters (WOL)	May 18, 2009
8	Young people's knowledge attitudes & behaviors: gaps in environmental education curricula & teachers' competencies. Formal sector	World of Letters (WOL)	May 18, 2009
9	The mapping concepts of water, energy conservation and solid waste management in the Jordanian national curriculum- formal sector	World of Letters (WOL)	June 7, 2009
10	Solid waste behaviors within the formal and informal waste streams of Jordan	Entity Green	June 20, 2009

Annex A presents a summary of pertinent research findings and ***Annex B*** contains the original transcripts from the Report-Out workshop.

2. ANALYSIS OF BEHAVIORS OF HOUSEHOLDS

2.1 Water

2.1.1 Research Results

Knowledge level high about scarcity (89%), resources (71%), and causes (70%)

- Few activities to increase knowledge are needed. Reinforcement and "norming" of existing behaviors is needed --i.e., reinforcing social norms in communities and neighborhoods or amongst specific target groups.
- Behavior levels high, little remaining activities needed to increase efficiency except in new construction (water harvesting, code enforcement). Technical strategies for water conservation at the household level are few.
- Assuming future demand will increase as life-style expectations grow and the population increases, an emphasis on youth is called for to create a water ethic, independent of water prices, i.e., youth should learn to save water because of scarcity, not price.
- Utilities should start refining their messages from simple efficiency messages to targeted messages, e.g., drought regulations based on rainfall and dam capacity.
- Construction and plumbing codes aren't being adequately addressed by relevant agencies (GAM, Eng. Assoc., Ministry of Public Works and Housing MPWH, Royal Scientific Society RSS) so a promotion of codes may need to be done with the public to ensure compliance.

Water Authority still being blamed by almost 50% of the public; the public still not willing to take more personal responsibility until they see WAJ making effort

- The Communication and Public Relations Department at the MOWI needs to focus on things they are doing well—not just supply-related investments such as megaprojects. For example, infrastructure repair, reduction of losses, attempts to deal with theft (unaccounted-for water) etc. MOWI needs to build credibility before the population can accept conservation message.
- The Jordanian public needs more realistic explanation of large-scale projects by linking it to impact on population. Any increase in supply will cause rate increases because of corresponding infrastructure cost (dams, Disi, Red-Dead, etc.).
- Consider another small rate hike in one year across the Board to remind people of a crisis, but after utilities and MOWI begin to create trust relationships. People will be more receptive—already they're talking about using rate hikes as a conservation measure (78%).
- 88% recommended Neighborhood Water inspectors with authority to fine excessive use.

Other Research Results

- According to the research, 75% of Jordanians have no gardens; 50% have no car; 68% have no flush toilet; 73% have no automatic washing machine.
- 18% of households named (without prompting) WEPIA's conservation logo, Abu Tawfir, as a source of water knowledge.
- 33% of households already use water saving devices.
- Several of the rural communities studied (e.g., Ajloun, Azraq) had already exhausted their own water supplies through individual effort (e.g. building their own harvesting systems, re-using gray water, as well as life-style changes). Theft of water not uncommon and not limited to household use but also to irrigate kitchen gardens and agriculture. *See other finding related to water and energy theft by youth in Chapter 4.*
- Public attention to the overuse of aquifers in agriculture is very low.

2.1.2 Priorities for Behavioral Change

- Ensure that water utilities include the following behaviors in their communication strategies (not to be implemented under the Jordan PAP grants program):
    i. Using bucket for large jobs (i.e., car washing, floor mopping using recycled water),
    ii. Taking shorter showers,
    iii. Turning off taps for some tasks,
    iv. Using water saving devices.
- Comply with restrictions developed by utilities for times of drought triggered by dam level.
- Promote and enforce new building codes and include water harvesting systems in new buildings.
- Understand and comprehend water bills and household consumption. Compare own consumption with neighboring households (benchmarking).
- Water theft.
- Encourage periodic maintenance of water systems and conduits in new and old houses.

2.1.3 Recommended Activities

- Set higher targets for some behaviors already implemented and create norms around them. For example: if 30% of new housing already use aerators, then set target at 50% to be achieved by preset year. If 20% of the population is already using a bucket to wash cars, or using grey water to wash floors, then set target at 40% (subsequent omnibus surveys can help measure the increase over time).
- Upstream work including higher order regulations that will potentially impact the economy. For example: reduce the number of zones where villas can be built and instead encourage apartment buildings which are more water efficient; adopt new regulations for apartment

buildings that require common laundry facilities in basements (rather than individual facilities in each home) and temporary storage of grey water for cleaning common areas.

- Focus on new construction or renovation of "iconic" buildings such as Haya Cultural Center and Amman Institute, to ensure they use and comply with the highest level of LEED (that address water and energy conservation). Other "iconic" buildings include the three new museums currently under construction for Jordan (e.g., Antiquities, Armaments). Work with ASEZA to ensure that all new large-scale investment construction in Aqaba (such as the new $12 billion Mubadara project) will be code compliant.
- In rural areas that face a particularly difficult water future, activities are needed to encourage communities to adopt water harvesting, grey water re-use, and small community dams to increase their own supply.
- Increase water efficiency in new construction (water harvesting, code enforcement).
- Examine role of Water Inspectors and Royal Rangers and the feasibility of enhancing their mandate to fine excessive use.
- Build on recognition factor of Abu Tawfir to promote water conservation (PAP).
- Water utilities should implement targeted campaigns supported by MOWI to increase the use of water saving devices.
- Water utilities need to develop restrictions for times of drought triggered by dam level and a communication campaign with enforcement (using Abu Tawfir).
- Communication strategy is needed to get all new construction to abide by the new building code (specifically water harvesting specs once developed and approved by MOWI). PAP can help develop a comprehensive communication strategy in partnership with GAM, Engineer's Association, Royal Rangers, and NGOs. Communication materials would need to target those building new houses, architects association, contractors, and others -so they are code-compliant from the start.
- Promote behavior messages that include anti-theft messages, coupled with ways communities can increase their water supply (especially in rural areas).
- Partner with and assist water utilities in making water bills easier to understand; compare consumption over time, i.e., with previous years. MOWI and Miyahuna are now billing subscribers on a monthly basis (it was quarterly) which will facilitate comparisons.
- Use social media tools (incl. blogs, cell phones internet) to:
    i. Draw attention to the overuse of aquifers in agriculture (public debate).
    ii. Alert customers to water cuts in their neighborhood, to remind them about drought restrictions, to send messages about community events led by utilities, or tax deductions for installation of water-related hardware.
    iii. Remind people to do routine (at least twice per year) inspections of their residential water systems and implement leak repairs when needed.

2.2 Energy

2.2.1 Research Results

Knowledge level low about scarcity (6%), Jordanians have little sense of an energy crisis and poor knowledge of energy sources; however high behaviors practice (75%)

- 75% of households already use simple technologies to reduce energy bills (if not usage) and a few have already committed to life-style changes.
- Too few households own energy or water-efficient appliances to be useful to focus on their appropriate use (use the machine with a full load). The cost of washing machines and other white goods is high and the target group (potential buyers) is too limited. Therefore, purchasing low-energy and water efficient machines would not be an important behavior to promote at this time, though worth watching trends for later inclusion in a campaign. Finally, the water (and energy) savings from such a promotion would not justify the investment cost linked to promoting and purchasing these goods.
- Only 14% of households use solar energy for heating water.
- Central and local authorities are not promoting energy conservation.
- The general public was surprised to hear that Jordan is facing an energy crisis. There was great misunderstanding and/or confusion as to the source of energy with many citing renewable energy as Jordan's principal source of energy. The Ministry of Energy and Mineral Resources and energy utilities are considered a trusted source of information but not providing any at this time.

2.2.2 Priorities for Behavioral Change

- Increase knowledge and awareness about energy issues and ways to conserve (sources, consumption, cost, etc.).
- Householders should purchase, install and maintain energy efficient technologies (solar and solar thermal systems) and products (choose "Energy Star" or other, energy saving light bulbs, etc.)
- Theft of electricity
- Drive vehicles more efficiently (i.e., acceleration, deceleration, tire pressure, preventive maintenance to achieve desired mileage)
- Promote microwave use as a cooking/re-heating method that uses less energy, is safe and preserves nutritional value of food.

2.2.3 Recommended Activities

- Information and awareness campaigns needed for the general public. Such public information campaigns should be sequenced / staggered to sensitize the public to the energy crisis. Campaigns should be specific for each type of energy source (e.g., kerosene, propane, and diesel); followed by development of targets to raise specific practices and development

of programs and promotion of specific methods to reduce energy consumption at the household level; followed by testimonials to make people think a new norm has been achieved.

- Upstream work: intensifying efforts to incorporate energy conservation in relevant building codes for households, public/government and commercial buildings.
- Conduct targeted economic research to determine which energy sources cost GOJ the most and should be targeted for conservation campaign --e.g., gasoline, diesel for electricity production, butane gas for home cooking. PAP needs to watch trends in global climate change to see how they affect sales of air conditioning systems. Large consumers and households are primary audiences in deciding where and how to spend PAP funding.
- Assess opportunities for upstream efforts to reduce the cost of efficient technologies (solar), needed to provide motivation (e.g., tax deductions, custom exemption, energy rating).
- Work with energy utilities on specific energy-related issues like theft of electricity (ERC loses a sum of 6% of distributed electricity which is equivalent to JD10 million each month due to theft).
- Educate public about behaviors related to the purchase, installation and use (and disposal) of specific products -- e.g., energy-efficient light bulbs, solar energy panels. Also need to educate public about which of their behaviors actually impact energy consumption.
- Encourage innovative measures (as well as Best Management Practices) to reduce energy consumption with diverse audiences e.g. architects to design homes that are energy efficient, contractors to use materials that are energy efficient. Focus on household audits to increase low-cost, no-cost methods (goal would be stop drafts from leaky windows and doors in winter, increasing insulation, adjusting thermometers, drawing curtains against the sun in summer—all add up to cost savings and energy savings).
- According to 52% of households who own cars, improved driving could improve fuel consumption. However, at this point PAP has insufficient data to make a case for promoting specific behaviors regarding cars (incl. data about car ownership disaggregated by gender).
- Offer limited and very targeted training for vendors who want to specialize in selling water- and energy-saving devices and appliances including white goods.

2.3 Solid Waste

2.3.1 Research Results

Low knowledge and low behaviors

- GAM has one biogas treatment plant functioning and another about to start for which they are considering a separation program for homeowners.
- Most households do not practice separation, do not know what their waste consists of (organic vs. recyclables), do not know about the recycling that currently exists as an informal

activity, do not know about times of pick-up by municipality garbage trucks, but are generally satisfied with services.

- Waste collectors complain that because household garbage is deposited after pick-up by municipal trucks, cats and other animals get into bins and strew garbage. Because household recyclables are not packaged separately, reclaimers/scavengers often tear up garbage bags to salvage recyclables, increasing litter around bins.
- Householders are willing to separate, some wanting special containers. In general, new behaviors can be worked on as there are "pre-contemplation and contemplation" levels amongst householders (i.e., levels of readiness and willingness of a target audience to adopt a new behavior). Householders would be the first target audience once a waste recycling policy or program has been developed and is ready for implementation.
- For a certain segment of Jordanian society, separating household waste and keeping organic material (a.k.a., wet waste) separate from other recyclables may simply mean more work for maids.
- There are complex systems of informal recycling taking place (primarily in Amman but also in other localities) through informal "reclaimers"/scavengers who visit garbage bins and remove recyclables before the city garbage trucks. These are sold to upstream private sector recycling firms who ship them to appropriate factories both inside and outside Jordan.
- At present, there is no system in Jordan to recycle glass.

2.3.2 Priorities for Behavioral Change

- Separate solid waste into recyclables, non-recyclables and organic waste
- Place recyclables in a clear place for scavengers to collect (even in the absence of a formal recycling program)
- Improve waste disposal in waste containers (a.k.a., curbside) and avoid littering
- Understand what is litter
- Communicate schedule for waste collection to households at neighborhood level; place household waste (trash) out for pickup in a timely fashion
- Accept and acknowledge the merit of waste collection, scavenging and manual labor
- Work with Ministry of Industry to encourage private sector glass recycling factories

2.3.3 Recommended Activities

- Use trained community organizers to foster community activism in favor of proper waste disposal. Work with GAM on youth as potential supporters of such initiatives (pilots). Set up a pilot neighborhood recycling program, managed by the community.
- Focus on general knowledge issues about what constitutes litter, and cultural practices around litter. Young men are prime targets as they are the major litterers. PAP needs to start upstream with GAM, Aqaba and other municipalities to determine their future policy direction (do they intend to start city-wide recycling or will it remain as an ad hoc effort);

PAP can work with either. Targets include GAM employees, truck drivers, etc. as the weaknesses seem to be systemic. There are also (upstream) ethical issues related to garbage collection and clean-up in poorer neighborhoods.

- Begin the process of changing attitudes towards manual labor by focusing on outdated concept of masculinity: Social Marketing looks at systems, and the weakness in all systems related to water, energy and solid waste in Jordan is the reluctance of Jordanians to engage in manual labor stemming from male attitudes regarding their own masculinity (highly individualistic, highly resentful of authority, reveling in freedom to act as they want as seen in driving practices and littering behavior). Many of the environmentally negative behaviors come from young men starting as young as 15 and continuing into adulthood.

  There should be a long-term strategy to address the cultural barriers affecting vocational work in Jordan. Jordanian reliance on imported labor for residential work increases the difficulty of educating householders in efficiency behaviors; maids, *harries*, gardeners and other foreign labor do not perceive any benefit from changing their own behaviors; in fact, they may perceive barriers to behavioral change (e.g., using a bucket instead of a hose to clean a car requires more work). Also, the economic savings derived from water and energy conservation by householders is no incentive for foreign labor to change their behaviors.

  GAM's 4,000 and Aqaba's 400 waste collectors cleaning the streets of Amman and Aqaba respectively are, by and large, foreigners. The few Jordanian ad hoc recyclers collecting recyclable material from garbage containers are considered engaging in a shameful activity. This kind of thinking needs to be addressed head-on as it impacts a great deal of the efforts being made by PAP and other projects. (e.g., Youth survey to see attitudes about environment and demand for jobs). Such a program, if successful, would target specific groups of people like young men, and would send ripples into the Jordanian economy. PAP recommends a pilot project to start with, and additional research to design and implement such a campaign.

- Improve trash collection in poorer neighborhoods. This requires a battery of measures including (i) increasing the number of inspectors to monitor waste collection, (ii) encouraging efforts by communities and homeowners to clean their neighborhoods, and (iii) working with GAM to start programs inviting youth to separate and collect household recyclables at neighborhood level –to be implemented through CBO and NGO grants.

- Assess the feasibility of banning plastic bags and require people to carry re-usable bags to market. If a total ban is not possible, consider other policy options such as requiring outlets and supermarkets to charge a mandatory fee on plastic bags and retain the plastic bag ban as a long-term option.

3. ANALYSIS OF BEHAVIORS OF LARGE CONSUMERS

3.1 Water and Energy

3.1.1 Research Results

Knowledge of managers, and maintenance personnel in all enterprises

- Knowledge about water issues is high but knowledge about energy is much lower.
- Current behaviors of large consumers related to water and energy are low.
- Very few establishments/facilities monitor consumption of water or energy. Audits are very sporadic. (PAP survey on behavior amongst this group assumed that in order for managers to perceive a consumption problem they first had to monitor existing consumption).

3.1.2 Priorities for Behavioral Change

The Jordan PAP team is still identifying discrete and tangible behaviors for the problems that we have identified among large consumers. The following bullets therefore are "work in progress" and include a mixture of goals, behaviors and potential activities for Jordan PAP and others to pursue. Changing the behavior of large consumers to achieve tangible reductions in water and energy consumption will require Best Management Practices (BMPs), many of which are industry specific.

- Mainstream the practice of conducting regular (annual?) audits of energy and water use and implementing audit recommendations. For large enterprises, audit findings should be shared with relevant authorities (e.g., Royal Rangers, MOWI, MEMR, ME) to ensure enforcement.
- Enforcement of audit recommendations requires upstream work with the Ministry of Industry, Chambers of Commerce and Industry, to develop the regulations that permit this kind of enforcement.
- Encouraging factories to lower production during peak hours and increase production during off-peak hours. Assist industries and businesses to increase activity during off-peak hours (this would translate into direct savings in terms of reduced energy costs). Water and energy utilities should include such measures in their communication strategies.
- In collaboration with the water and energy utilities and IDARA, disseminate targeted messages aimed at industry owners educating them about investment costs versus operating costs.
- Purchase, install and use of sub-metering in large consumers to determine water and energy use at the level of individual buildings and/or production units (also to be added to communication strategies of utilities).
- As part of the permitting process for new industries, review facility designs to include energy conservation methods (upstream work with utilities)
- Mainstream the practice of implementing preventive maintenance programs

3.1.3 Recommendations for Government and Public Buildings

- The current system of centralized bill payments in public buildings works against conservation –i.e., Secretaries General do not know what their consumption rates are, as bills are paid centrally by Ministry of Public Works. No comparisons are provided. Centralized agencies therefore need to inform each manager/department what their consumption is (opportunities for healthy competition between managers/departments on who consumes less or achieves the highest savings over time). Another recommendation would be to publish materials on Best Management Practices, tailored for government and public buildings.
- Government economic measures preclude investing in new equipment even if operating costs are lowered and payback period is quick.
- Maintenance personnel in government and other public buildings are not familiar with water and energy saving measures.
- Government buildings should set the standard for all buildings in Jordan. There are many buildings willing to be "green" and even seeking LEED recognition (Amman Institute, Haya Cultural Center) but willing to accept "bronze" (the very lowest level) because of the perceived investment cost (especially for retrofits) and the returns on the investment -- "bronze" level does not include any significant water or energy savings. PAP anticipates that over the coming years, every effort should be made to require the GOJ to meet the higher standards not the lowest ones. The Green Building Council should revise the point system for LEED certification, to include, at a minimum, the technologies related to water and energy conservation.
- PAP needs to get engaged in upstream work with the GOJ to explain that BMPs in water and energy are not luxuries but are necessities. It would be especially important to address agencies such as GAM, other municipalities, and the Development Zones where water supply has almost reached maximum capacity (service delivery).

3.2 Solid Waste

3.2.1 Research Results

- Currently, there is no formal Government recycling program in Jordan for large consumers, although the Government taxes recyclables destined to recycling factories outside of Jordan. This constitutes a disincentive for private sector recyclers.
- Entity Green (EG), a private waste contractor, has since 2007 entered into recycling agreements with 20 large consumers --mainly five-star hotels in Amman and Aqaba and European embassies, and will soon move to Wadi Musa. EG trains workers in each facility to sort the solid waste and then provide regular collection of stored recyclables. EG tried to introduce a similar program for government buildings but the program ended quickly (was not commercially viable) because building managers/wardens expected payment for the sorted waste.

- Recycling in Aqaba. ASEZA contracted Clean City to collect solid waste including paper and cardboard as these are recycled in Jordan. ASEZA charges JD20,000/month from the large consumers in Aqaba to finance the Clean City contract. When EG offered to collect recyclables in Aqaba ASEZA responded by postponing EG's license to work in Aqaba and forbidding them to collect waste from hotels. (Note: EG's services would reduce the total amount of waste to be collected by Clean City and so hotels expected a reduction in collection fees). Some hotels then responded by segregating their recyclables and storing them separately, refusing to call it waste, effectively reducing the amount waste of collected by Clean City. While ASEZA did not reduce the JD20,000 fee, in March 2010 it allowed EG to operate in Aqaba by collecting recyclables from hotels (minus cardboard still collected by Clean City).

- EG recently (March 2010) moved into the domestic recycling market by placing sorting containers outside COZMO, a major supermarket chain in Amman. Customers (as well as nearby residents) can now bring their own household recyclables (aluminum and plastic primarily) and place them into separate bins provided and collected by EG on weekly basis. (Household recycling activities were once managed by the Jordan Environment Society but have gradually shifted over to EG as JES could no longer sustain their activities).

3.2.2 Priorities for Behavioral Change

- Serious efforts are required to increase the awareness and knowledge level of large consumers, and municipalities, about the issue of solid waste and recycling. Like other environmental concerns, the issue has been reduced to a question of money (who gains, who loses) rather than civic responsibility.

- Work upstream with Ministry of Environment and Ministry of Municipalities and Governorates to encourage greater recycling, even by private sector, to reduce the pressure on rapidly-filling landfills. Aqaba's landfill is almost full and ASEZA is requesting donor assistance for a new one, but the trash could be reduced by 30% if they permitted greater recycling by firms like EG.

3.3.3 Recommended Activities

- PAP considers that few in the target group of large consumers, are in pre-contemplation mode and raising knowledge for others will not help. PAP considers this to be an upstream/policy issue which should be taken up by the Ministry of the Environment in cooperation with the Ministry of Municipalities (ASEZA is a different case).

- PAP support for MOE's communication strategy should include promotion of urban recycling.

4 ANALYSIS OF BEHAVIORS AMONG YOUTH

4.1 Formal Sector

4.1.1 Research Results

Knowledge level high for water and energy conservation and resources

- While youth in most grades are extremely familiar with water issues and to some degree about energy, their knowledge is primarily theoretical and divorced from practice. Their knowledge of issues specific to Jordan is weak in general.
- Teachers complain they are not familiar enough with the subjects of water, energy and solid waste to teach them in other than rote –i.e., when students are taught a single point of view and not encouraged to do critical thinking, alternative paradigms, etc. Text book coverage of water adequate, coverage of energy very weak, and coverage of solid waste adequate –*see separate report on textbook mapping exercise*.
- Vandalism in schools is rampant often targeting taps in bathrooms, aerators, and solar systems where they exist. Survey results show that 5-10 year old boys are the worst, but that all boys engage in vandalism at schools. The MOEd spends a lot of money repairing schools and is therefore less inclined to invest in water-saving devices such as double-flush toilets (which kids can clog deliberately), automatic shut-off faucets, etc.

4.1.2 Priorities for Behavioral Change

- Teach concepts and issues related to energy in Jordan (e.g., sources, cost, losses, pollution)
- Use interactive teaching methods in the classroom, in respect to environmental issues
- Student involvement with environmental issues: attend club and school programs, participate in after-school programs and tours
- Understand and demonstrate environmental ethic
- Build and retrofit "green" schools and use as instruction tools
- Identify and exchange success stories among teachers as a "Community of Practice"
- Award "Green Certificate" for Green Teachers
- Understand the environmental and cost implications of vandalism in schools; learn to say "no" to vandalism even under peer pressure; renounce vandalism.

4.1.3 Recommended Activities

- Getting teachers, in appropriate subject areas, and those assigned to club management to use interactive methods to give practical experience to children and to focus heavily on Jordanian issues. Teacher training and the production of interactive materials are highly needed.

- Develop in-school extra-curricular programs to encourage children to get involved actively with environmental issues. The behaviors would be:
    i. Get children to attend club and school programs and demonstrate intrinsic behaviors—(environmental ethic) while also demonstrating familiarity with Jordan's critical natural resource situation.
    ii. Get utilities to offer after-school programs, tours, visits to MOWI filtration systems, underground stream (e.g. Ras El Ain). Make visits interesting as well as informative. Train utility representatives. Focus on 10-15 year olds.
    iii. Ensuring adequate school-based immersion programs would allow girls to get engaged as after-school programs generally disenfranchise girls who need to return home immediately after school and help out mothers at home.
    iv. Encourage "green" school construction and renovation through USAID school programs and Madresati programs, to serve as demonstration sites for other schools.
    v. Upstream efforts to reduce vandalism with strict punishment for children caught engaging in vandalism as well as requiring parents to pay back cost of child's vandalism.
- Address littering as part of any future teacher training programs. Young children need to know what constitutes litter as well as what is culturally acceptable and what is not. Maybe re-focus "culture of Shame".

4.2 Non-Formal and Informal Sector

4.2.1 Research Results

- Knowledge levels amongst school-aged children are high in water and energy, tapering off for 15-25 year-olds.
- Current behaviors of certain age and income groups are acceptable but enforced by parents since most of this age group lives at home and the cost of the bills forces them to conserve. The "pre-compliant and compliant" age group are middle income youth aged 10-15 (triggers would include practical hands-on activities that are real-life issues). In other age and income groups there was no intrinsic interest in behavioral change.
- Principal concern of older youth is employment with environmental issues considered luxuries. Nevertheless, some expressed interest in participating in activities that would be meaningful and/or paid.
- Survey showed that youth (in certain areas including Ajloun and Azraq) could readily demonstrate how to steal water and energy from municipal lines.

4.2.2 Priorities for Behavioral Change

- Conserve energy resources at home
- Value manual labor --*see Section 2.3.3 on perception vis-à-vis vocational training*

- Participate in out-of-school immersion activities related to water, energy and solid waste
- Intern at environmental organizations and green agencies
- Discuss and engage with the issues of water, energy and solid waste (using social media tools as a platform)
- Engage in peer to peer activism to promote specific green behavior

4.2.3 Recommended Activities

- Recommended activities for the 15-30 year age group (that can take up manual jobs):
    i. Changing cultural perceptions around manual labor.
    ii. Provide out-of school immersion activities for youth aged 10-15 through Community Centers and established NGOs—"Outward Bound courses", Ministry of Sports, etc. Ensure immersion science clubs for girls and boys separately.
    iii. Get university students who have service requirements for graduation to intern in organizations that have environmental programs and do hands-on work in water, energy and solid waste, then train younger age groups.
    iv. Work with younger children through established centers such as Haya, Zaha, Children's Museum, JOHUD centers
    v. Consider inter-generational programs in communities and community-led organizational efforts.
    vi. Foster innovative use of social media for this age group, on-line games, blogs etc. with the intention of first fostering interest, then behavior.
    vii. Encourage advocacy from this age group through training programs in advocacy and grants to do advocacy on a series of priority issues in water, energy and environment. Get youth engaged in civic activism. Use *trans-media* communication models to create "buzz" and fun around the three themes leading to behavior change.
- Continue work with Children's Museum, Haya Cultural Center, Zaha Cultural centers and other centers managed by JOHUD, Jordan River and other NGOs.
- Engage Jordanian university students with the issues of water, energy and solid waste. For example, (i) encouraging university students to use their 10-hour mandatory service requirement for graduation to work with junior youth, or to perform green activities, or intern with green agencies; and (ii) include some outreach and behavioral tips in the mandatory "communication" courses currently given to all university students.

5 SUMMARY OF PRIORITY BEHAVIORS

Chapters 2, 3 and 4 presented key research findings and priorities for behavioral change, as well as recommendations for behavioral activities (including upstream work) to be implemented by Jordan PAP and/or other projects, organizations and agencies. Exhibit 2 overleaf synthesizes the indentified behaviors further by sector and by target audience.

This report therefore has identified and described a long-list of behaviors that need to be addressed by PAP and others to improve water and energy conservation and reduce solid waste in Jordan. While this behavioral document is a good foundation for most of PAP's work in the coming years, PAP will also be designing other interventions some of which were included in the Phase II Work Plan. Such interventions include but are not limited to:

1) Institutionalization of social marketing training in Jordan (eventually in the form of a Social Media Diploma).
2) Continued support to CMJ (exhibit design, website development, other program support) and HCC (program support).
3) Other interventions including:
    i. Study tours (the International Social Marketing conference to be held in Dublin in March 2011),
    ii. Providing support to international conferences in Amman (e.g., session on Water & Communication at the March 2011 IWA Conference)
    iii. Other international conferences such as a PAP-designed International Social Marketing Conference to launch the diploma program in Year 3.

Exhibit 2 – Summary of Behaviors by Sector and by Target Audience

		WATER	ENERGY	SOLID WASTE
HOUSEHOLDS		***Use*** bucket for large jobs, ***take*** shorter showers and ***turn*** off taps for some tasks. ***Address*** Water Theft ***Use*** water saving devices. ***Comply*** with water restrictions developed by utilities ***Promote*** and enforce new building codes. ***Encourage*** periodic maintenance of water systems and conduits . ***Compare*** own water consumption with neighboring households. ***Understand*** water bills and household consumption. ***Install*** water harvesting systems in new buildings.	***Increase*** knowledge and awareness of energy issues. ***Purchase, install*** and ***maintain*** energy efficient technologies and products. ***Address*** Theft of Electricity ***Drive*** vehicles more efficiently. GOJ to ***employ*** more appropriate and more cost effective fuels.	***Separate*** solid waste into recyclables, non-recyclables and organic waste. ***Improve*** waste disposal in waste containers and avoid littering. ***Understand*** what litter is. ***Communicate*** schedule for waste collection to households at neighborhood level. ***Place*** household waste (trash) out for pickup in a timely fashion. ***Accept*** and ***acknowledge*** the merit of waste collection, scavenging and manual labor. ***Place*** recyclables in a clear place for scavengers to collect.
LARGE CONSUMERS		***Conduct*** regular audits of energy and water use and implementaudit recommendations. ***Share*** audit findings with relevant authorities to ensure enforcement. ***Develop*** regulations that permit enforcement of audit recommendations ***Reduce*** factory production during peak hours . ***Assist*** industries and businesses to increase activity during off-peak hours. ***Educate*** industry owners about investment costs versus operating costs. ***Purchase, install,*** and ***use*** of sub-metering in factories to determine water and energy use at the level of individual buildings and/or production units. ***Review*** facility designs to include energy conservation methods as part of the permitting process. ***Mainstream*** the practice of implementing preventive maintenance programs.		
YOUTH	FORMAL	***Teach*** concepts and issues related to energy *in Jordan* (e.g., sources, cost, losses, pollution). ***Use*** interactive teaching methods in the classroom, in respect to environmental issues. ***Engage*** students with environmental issues: attend club and school programs, participate in after-school programs and tours. ***Understand*** and ***demonstrate*** environmental ethic. ***Build*** and ***retrofit*** "green" schools and use as demonstration / pilot tools. ***Identify*** and ***exchange*** success stories among teachers as a "Community of Practice." ***Award*** "Green Certificate" for Green Teachers. ***Address*** Vandalism of Schools.		
	NON-FORMAL	***Conserve*** energy resources at home ***Value*** manual labor ***Participate*** in out-of-school immersion activities related to water, energy and solid waste ***Intern*** at environmental organizations and ***engage*** Jordanian university students with the issues of water, energy and solid waste ***Discuss*** and ***engage*** with the issues of water, energy and solid waste (using social media tools as a platform) ***Engage*** in civic activism and advocacy concerning environment issues		

ANNEX A
SUMMARY OF SURVEY FINDINGS

A.1 NGO & CBO Capacity to do Social Marketing, Outreach & Communication

The survey was implemented during January and February of 2010. Of the 38 interviewed organizations, 27 were NGOs of which three had an environmental focus including NERC, GEF, and IUCN. Eight were CBOs. The survey's primary objectives were to review NGO/CBO experience in communication/outreach, assess the capability of individual staff in the relevant NGOs and CBOs to use public and social media outlets for conducting social marketing programs, evaluate knowledge and skill sets of communication staff and identify gaps to be addressed by PAP as part of the project's capacity building activities, assess the capabilities of NGOs/CBOs to distinguish between public relations and behavior change communication, and (ability to) conduct behavior change programs, and assess the ability of NGOs/CBOs to manage a grant program and conduct a targeted behavioral change activity.

The findings also discussed the residual effects of WEPIA, which appeared to have a strong impact at the five NGOs that received training for social marketing – they are still high level decision-makers who have dedicated communications staff and in one case an advocacy department.

The principal findings from this study are the weaknesses of NGO capability to handle and manage strategic, targeted behavior-change communication, although all, to some degree conduct campaigns, produce materials and are engaged in public education. This is also reflected in the fact that of 38 NGOs only 13 had dedicated communication staff. While the NGOs ranged in size from very large (JOHUD, RSCN) to very small CBOs, the use of mass media in particular tended to be limited unless it was free use, as on TV talk shows. CBOs tended to rely on town meetings as a communication tool. Very few used social media though several had websites. Partnerships amongst NGOs are still scarce although a few have teamed up to provide services to specific projects (Jordan River Foundation and MercyCorps). One important finding suggests that despite the continual struggle to find funds and remain stable most NGOs seemed to be able to survive with their chief officers remaining at their posts for a very long time, though they downsize whenever funding is unavailable.

The effects of the WEPIA program are also strong in those NGOs that had partnered with that project as the 5 NGOs that had received training in social marketing showed strong evidence of success in their communication activities though only three (CSBE, JREDS, RSCN) continued with water-related programs. CSBE and JREDS in particular have continued expanding the programs they began with WEPIA and have succeeded in obtaining separate funding. A recent (2010) study conducted by a sister-USAID project noted that of the more than 2000 NGOs and CBOs registered in Jordan only 15 NGOs controlled 75% of the funds in that sector. These included such large Associations as the Engineer's and Agricultural Engineers Associations, as well as large Islamic charities and secular, cause-related NGOs.

PAP intends to work with NGOs in improving their ability to conduct strategic, behavioral, campaigns through its grant program and also through the diploma program in Social Marketing/Strategic Communication. This will be an important program intended to professionalize the varied ad hoc activities currently under the umbrella of communication.

A.2 KAP Household – Baseline Survey

The Household Baseline Survey on the use of water, energy and the management of solid household waste was Knowledge, attitude and practice (KAP) study.

A nationally representative sample of 1,000 households was the base population for this survey. Principal findings of the many water questions asked was that the general public does indeed have a high awareness and knowledge of water scarcity in the Kingdom and even of the available water resources. Most people are also taking some useful measures, both lifestyle changes and water efficiency measures, to conserve the water they get. Only 4% admitted they take no measures at all but even amongst this group, the lack of conservation behavior stemmed from the fact that their consumption rates were already minimal. Interestingly, for the first time a large number (79%) considered it appropriate to raise tariffs for high consuming groups to further encourage people to conserve, though the respondents fully expected that their own monthly bill would not be affected. Conservation measures, it was clear were tied to the rationing system and were therefore extrinsically motivated. Ethical considerations tied to conservation were not raised by the public.

Some interesting findings emerged from this research that has implications for conservation programming. The large majority of the group surveyed had no gardens (79%), no automatic washing machines (70%), no cars (51%), and no dishwashers (98%). The survey findings suggest that the amount of water savings from targeting those whose life styles included the above might be minimal and might not be worth the costs of outreach until more aggressive measures are needed. In general there seemed little more the general public can do to take conservation of water at the household level further. Enforcing codes in new buildings (such as water harvesting, enforcing flow rates etc…), developing regulations post-construction such as regulations for buildings being sold and/or renovated requiring them to comply with codes, might be additional ways to gain efficiency. The high levels of knowledge indicate that there is significant residual knowledge remaining from the WEPIA program since Government efficiency promotion efforts do not specify behaviors. Some 18% even spontaneously recalled the character of Abu Tawfir suggesting that it may be worthwhile resurrecting the character as a logo of future programs. One further finding will prove useful to programmers and it reflects the nature of the Government's own communication activities. Few people realized the extent of effort the Government was already making to improve infrastructure, calibrate meters, and provide alternative sources of water including the mega projects. Even fewer understand that the new water sources from these projects will be at a higher cost, suggesting that the Government must change its own messages to the public to remain a credible source of information.

The principal findings of the research in terms of energy uses at the household level were interesting in that in stark contrast to their knowledge of water, the general public's knowledge of any energy crisis was minimal and while they could state their own energy sources within the household there was little understanding of how electricity is generated and its reliance on imported resources. In terms of energy consumption at the household level principal energy sources used came from propane (for cooking purposes), kerosene and propane for home heating, and electricity primarily for lighting though 13% used it also for heating. Conservation practices were interestingly high given the low knowledge levels however, reflecting the high cost of electricity as compared to water. Over time extrinsic motivation needs to be substituted for intrinsic motivation. Environmental ethics needs to be nurtured amongst Jordanians as affluence and life style expectations will bring greater demands on utilities. Youth programs will therefore be very important to the future of energy in Jordan.

14% of the general public already had invested in thermal solar systems, and almost 50% already used fluorescent bulbs or low energy light bulbs. The implications for programming are clear. Energy needs a limited awareness campaign to inform the public of the high cost to the Government of providing fuel and that options such as nuclear, would not alleviate difficulties for many years to come. There also seems room

to promote solar energy in line with the Government's own policy, as the costs are rapidly decreasing. There is, finally room, for some low-cost/no-cost measures citizens can take such as drawing curtains or closing shades in summer and insulating homes better against heat loss in winter.

The principal findings of the research in terms of waste management at household level were remarkable in that more than 90% of respondents did not separate out any materials from their household waste; however, they were under the impression that their household waste was being separated after it was dumped at landfill disposal sites. The knowledge of waste management methods in general was adequate, especially, "recycling" with 96% of respondents defining the term correctly. However most thought erroneously that recycling was already being applied as a program in Jordan. Waste collection itself was not considered a problem as the research indicated that less than 15% complained about the collection process. Sadly in poorer neighborhoods the disparity in visible waste made it clear to residents from those neighborhoods that they were being slighted in favor of wealthier Jordanians.

A.3 Water and Energy Related Interviews for Large Consumers, and Rapid Energy and Water Audits for 22 Selected Entities

The water and energy related survey was primarily developed to assess the knowledge, attitudes and behaviors of managers, maintenance engineers and owners of large consumers, both governmental and private sector. The objective was to determine which, if any, of a large national sample of large consumers were practicing sustainable behaviors regarding water, energy and solid waste, and if not the barriers and potential benefits that could be brought to bear to encourage greater use of known technologies that could reduce consumption. The purpose of the audits was to "ground truth" the responses provided by those interviewed.

88 key informant interviews and 22 audits of large consumers were conducted. The survey categorized large consumers into a number of sectors: Hotels and Restaurants, Commercial buildings, Hospitals, Government Buildings, and the Industrial Sector.

A Best Management Practice (BMP) in both water and energy is the performance of regular audits by competent trained staff, sub-metering, and comparisons of past bills with current ones to identify trends for consumption. Regretfully it was apparent that of the 88 less than half admitted to doing any audits and only a few on an annual basis. Most used in-house maintenance staff whose ability to conduct audits is questionable, since they mostly repair and maintain existing networks and equipment. Of those who had been audited none implemented any audit findings, and few could produce the audits when asked. It is apparent that practice, as it concerns water and energy reduction is minimal, if at all. The behavioral implications are interesting.

Where an owner was also an operator/manager, some effort was made to audit regularly and to implement audit findings. In Public buildings the gap, both physical and in terms of information between the Ministry of Public Works which manages all utility bills for Public buildings, and the buildings themselves proved to be a major hindrance to improved performance by managers. The centralized system seems to work against conservation. Combined with instructions to lower costs, even simple investment costs that would reduce operating costs as well as consumption of energy and water do not get implemented.

The principal findings of the research in terms of waste management within the large consumers' utilities indicated that solid waste segregated and recycling is not common practices. Almost half of the small percentage that do segregate indicated that the segregation takes place inside the facility and is primarily because of contracts they have with a recycling company. The majority of the enterprises that do not recycle solid waste seemed to feel that there was no need for such a practice.

A.4 Government Institutions in Water, Energy and Environment

The Survey of Government Institutions in Water, Energy and Environment, similar to the NGO survey was intended to determine the skills base of senior management and communication staff in large institutions to using behavior change methods. It included a review of government agencies' current and past communication activities in water, energy and environment (mainly solid waste management).

The analysis was based on open-ended interviews conducted with a targeted sample of 36 staff from 22 government institutions, including public utilities. Given that almost all utilities have a public education function it was important to determine their skills to provide the public with specific, measureable, targeted information and actions which they can take to reduce consumption.

Given that there is no national communication plan or strategy for improving water, energy or solid waste management it was also important to determine the knowledge base of Government officials charged with public education. It is evident that among the three sectors, the water sector has received better attention from the government. Due to WEPIA's previous work on raising awareness of water issues in Jordan, the communication expertise is greater in water sector in comparison with the energy and solid waste sectors. However, ministries are focused on generic campaigns that are not beahvioral, nor on improving the overall image of the water sector, an important part of getting credibility with the general public. The focus of most communication messages is just on the supply side with limited consideration given to the demand side.

The principle findings clarify the reasons why senior management and communicators in large institutions do not use behavior change methods. There was much duplication of work among multiple government institutions on the management of water, energy and solid waste and some mixed messages. Ministry of Water, for example promotes mega projects (Disi and Red Dead) as if they were the solution to water shortage, but without explaining that the additional water would have higher costs and that Disi, at least, was a non-renewable resource. In addition the tension of donor driven programs, each with a different focus, made it difficult to acquire and train staff with the necessary skills. Communication training tends to be scattershot. The research found little evidence of comprehensive knowledge, and skills as to how to do behavior change in the concerned institutions. Perhaps as distressing is the finding that enforcement methods for existing codes, regulations etc…are not being observed by institutions that seem to have responsibility and that the system of enforcement is quite weak.

A.5 USAID and other Donor Efforts in Outreach and Communication

The goal of the Donor survey was to report on past, current and planned donor efforts in relation to water, energy and solid waste management and to determine the level of interest in donors and donor projects to use a behavioral approach to support water, energy and environment. The survey consisted of 39 open-ended interviews with donor officials and managers of donor-funded projects.

The principle findings in terms of donor efforts in water and energy are that donors have historically focused most on water, but energy is now a "hot topic" and many new projects are in the pipeline. Most projects have had limited baseline information, thus are not able to measure results. Despite efforts at coordination through the donor lender groups and individual contacts, there is almost no coordination on specific outreach components.

Donors expressed their priority target groups for behavior change to be: women, young schoolchildren, water sector officials, all stakeholders in the construction sector, and senior decision makers within and outside of

environmental sectors. Donors had different points of view on priorities, the main ones being; household water system rehabilitation and improved water quality at the tap; water sector officials need to provide more open, transparent information and improve their credibility with customers; support for increased tariffs; water quality is a more important issue than water quantity; reducing the effects of upland agriculture on the aquifer.

The principle findings in terms of donors' effort in solid waste management were interesting as it clearly stated that recycling is a goal promoted by the Ministry of Environment and the Greater Amman Municipality, but mechanisms are not yet in place to institute this on a practical level and donors expressed the need for one harmonized, transparent set of messages in water, energy and solid waste management.

A.6 Young People's Knowledge Attitudes & Behaviors on Environmental Issues: Water & Energy Conservation & Solid Waste Management- Informal & non formal Sectors

The survey of young people's knowledge, attitude and behaviors in environmental issues in the informal and non-formal sector explored the level of knowledge, attitudes held, and practices observed by young people age 17-24. The results will form a baseline for PAP on environmental issues related to water and energy conservation and solid waste management. The survey also assessed knowledge and attitudes of educators, staff, and youth workers to identify strengths and areas for improvement through capacity building. Equally it was vital to map out available resources, programs and learning opportunities in the informal and non-formal education sectors. A total number of 161 interviews using the variables of socioeconomic background, age, gender, area of residence, and employment status were used to achieve the qualitative survey objectives.

The principle finding highlighted the socio-economic class, employment status and area of residence for the youth in line with their willingness and readiness to behave well in issues related to saving water and energy and reducing solid waste. The principle findings on this regards were interesting as it determined youth living within the Lower Socioeconomic Class the most aware of environmental issues and are the most willing to change. Among all the youth categories, Underprivileged, Lower, Lower-Middle, Upper youth knowledge of water shortage is higher than energy but the practice in energy conservation is higher than in water.

The principle findings in terms of gender were interesting. Female shows more willing to participate in more positive environmental behavior, and in hands-on activities and programs to promote awareness, however, their knowledge are low. While males have better knowledge and concern especially in energy since they are paying the bills, they are unwilling to participate in any environmental activities.

The principle findings in terms of employed and unemployed youth knowledge and behavior stated that employed youth practice the water and energy saving since it is part of the work environment and ethics, however, their knowledge is less that the unemployed youth.

The principle findings in terms of solid waste and youth knowledge, attitudes and behaviors were interesting in line with the socio-economic class categorizations. Solid waste management seems to be moderate concept among youth; they are aware of the types of solid waste and the collection mechanisms, but unaware of the idea of reuse and reduce. They think waste is linked to poor facilities and believe that it is the government role to provide facilities.

A.7 Young People's Knowledge Attitudes & Behaviors: Gaps in Environmental Education Curricula & Teachers' Competencies- Formal Sector

The survey designed to assess young people's in the age of 6-15 knowledge, attitude and behaviors in environmental issues as compared to the curriculum learning objectives, determined the environmental programs and curricula available to young people through formal educational settings and examine teacher's roles, their skills, attitudes and ethics, and assess their training needs. 12 public schools, 4 private schools, 412 students, 40 teachers, and 12 principals were included in the survey presenting the sample gender, school type, area, age and other out of school activities such as Madrasati and Nature Clubs.

The principle findings of this survey confirmed the fact that males have more knowledge on environmental issues, however, female's participations are much better.

The principle finding of this survey open eyes on the fact that curricula and teachers had succeeded in disseminating factual knowledge, however insufficient in modifying attitudes and behaviors. Based on a comparison between students attending out of school activities and those who are not, some interesting findings have implications for intervention programming to change behaviors. 100% of students participating in nature club activities have the right attitude on water conservation. On the other hand, the students attitude and participation in energy conservation and reduce the solid waste are higher among students who are not participating in nature clubs.

The principle findings stated the need for emergent programs for students in which they learn conservation skills, practice the right behavior and change their behaviors towards green. The principle finding support this statement as the teacher assessments shows that teacher are unsatisfied about the extensive theories presented in the national curricula, the lack of hands-on activities and very extensive curricula with no logical flow of information in the since that do not allow the teacher to spend time on explaining concepts. Teachers received little in the way of training, support, incentives and mentoring, this reflected largely on their own attitudes towards programs external to the curriculum.

A.8 Mapping Concepts of Water, Energy Conservation and Solid Waste Management in the Jordanian National Curriculum- Formal Sector

Textbooks mapping concepts of water, energy and solid waste management in the Jordanian national curriculum aims to evaluate the concepts of water, energy and solid waste that exist in the curriculum and the manner in which they are tackled. A comprehensive survey of 104 school textbooks from grades 1-10 in fourteen subjects was conducted.

Results of the survey showed that environmental education concepts were vastly covered in all subjects of the study with a total of 1777 concepts. While there were more water than energy concepts in the curriculum, most focused on scientific facts and information and were often repeated. More important concepts that tackle issues of social, political and economic implications of environmental problems and crises, as well as sustainable development were vastly missing. Solid waste concepts were few, and lacked the depth required to promote real understanding. These concepts were often delivered as add-ons to topics. The sequential development of the water concepts was very good compared to that of energy and solid waste. While energy concepts were repetitive and did not follow a sequential flow, those of solid waste were few and scattered.

Also, because of the style in which the Jordanian textbooks are presented, where there is greater emphasis on information and knowledge while very little space has been allocated to the synthesis and application of this information, the concepts remain superficially tackled. Furthermore, most activities and projects that promote

skills and participation require support materials that include worksheets and background information that can only be presented in supplemental teacher's guide material. Currently, the teacher's guide is rarely used and does not serve this purpose.

The principle findings emerge from the comparison between mapping results and behavioral variables shows the gaps in the concepts presented in the curricula. Water shortage, crises, use, quality and quantity are mentioned in one or two grads only. Energy concepts presented even less than water concepts. The solid waste management concepts are all over the curricula, however, the practice is very low.

A.9 Solid Waste Behaviors within the formal and informal waste Streams of Jordan

The aim of this study is to illustrate the waste stream in Jordan and to chart the behaviors and practices that shape it. To reach this target, Entity Green focused its qualitative research on public practices and attitudes towards waste, informal waste reclamation, the trade of reclaimed materials, and official waste management in both Amman and Aqaba.

In the study of the residential sector, data was collected regarding attitudes towards the waste-management system, perceptions and practices regarding waste within the household, and general attitudes towards reclaimers and other down-stream actors.

Residents demonstrated incomplete knowledge regarding waste-collection practices and levels of dissatisfaction about waste practices in Jordan. Residents also expressed a strong willingness to participate in recycling and other sanitation-oriented activities, tempered by skepticism that such activities would produce community benefits that would be embraced by the broader community. Negative attitudes towards littering were clearly articulated, often accompanied by the admission that respondents themselves sometimes engaged in littering.

From the research performed, it appears that Jordan has a well-developed informal recycling sector and that there is widespread awareness of the importance of cleanliness and sanitary practices. At the same time, however, "the environment" and "recycling" are regarded more as Western concepts, rather than issues of general concern and importance. There seems to be little connection in people's thinking between the existing recycling culture of collecting and selling valuable waste materials, locally known as *khorda* and "recycling" as a concept. Furthermore, certain types of waste, such as cigarette butts, coffee cups and Pepsi cans seem *not* to be considered as 'waste', as they have become a normal part of the surroundings and the result of an 'acceptable' level of littering. Greater focus on community and early education about issues concerning environment were found to key for recipe for success of integrating such 'foreign' concepts into local culture and behavior.

ANNEX B
TRANSCRIPTS OF REPORT-OUT WORKSHOP

(Group Work, in Arabic)

كبار المستهلكين للطاقة

	السلوك	الفئة المستهدفة
.1	توعية الإدارات بالعائد الاقتصادي الطويل الأمد المترتب من الاستثمار في الطاقة المتجددة وترشيد الاستهلاك	الإدارة العليا
.2	ترويج ودعم شركات خدمات وإدارة الطاقة	القطاع العام وشركات ESCOS
.3	توعية الإدارات العليا حول أهمية الطاقة	القطاع العام، وزارة الطاقة، شركات إدارة الطاقة، والنقابات المهنية
.4	تطوير وتفعيل التشريعات المتعلقة بإدارة وترشيد استهلاك الطاقة	
.5	اعتماد قبول مبدأ عمل شركات خدمات الطاقة ESCOS من قبل شركات القطاع العام والخاص	
.6	تبني كفاءة استخدام الطاقة في المنشآت	
.7	استعمال مبدأ التكلفة حسب النشاط activity based costing method في متابعة تكاليف الطاقة	
.8	اعتماد وتضمين مبدأ ترشيد استهلاك الطاقة المتجددة ضمن التشريعات القادمة	
.9	استعمال العدادات الفرعية	الإدارة العليا والفنيين
.10	مراقبة الاستهلاك ومتابعته من قبل موظفين مؤهلين	الإدارة العليا، الإدارة المتوسطة والفنيين

الملخص:

1	شراء واستعمال أجهزة القياس الفرعية في المصانع
2	تضمين مبدأ العائد الاقتصادي في أنظمة التدقيق من قبل الفنيين
3	مراجعة وتقييم التصاميم الجديدة للمنشآت بحيث تشمل ادخال مبدأ العائد الاقتصادي

الطاقة في المنازل

	السلوك	الفئة المستهدفة
.1	شراء السخانات الشمسية وتركيبها وصيانتها لأغراض تسخين المياه والتدفئة	رب وربة المنزل، أصحاب الاسكانات، المقبلين على الزواج، بائعي السخانات الشمسية
.2	تقليل قيمة فاتورة الكهرباء من خلال ممارسات ترشيد الاستهلاك (اجهزة energy star، الصيانة المستمرة، تركيب لمبات توفير الطاقة في الساحات الخارجية)	رب وربة المنزل، المؤسسات التعليمية
.3	زيادة معلومات الناس وقناعتهم بأن البدائل تحقق الوفر، وتحديد قيمة الوفر لهم	وزارة الطاقة ومراكز الابحاث والمؤسسات الحكومية المعنية
.4	زيادة وعي الناس بالبدائل	المناهج، الشباب، الإعلام

الطاقة والشباب

	السلوك	الفئة المستهدفة
.1	تعيين لجان البيئة في المدارس وإضافة موضوع الطاقة في برامج عملها	المدارس
.2	تقنين استخدام الطاقة وذلك بإطفاء الإجهزة الكهربائة عند عدم استخدامها أو بعد استخدامها	المنازل
.3	زيادة المعرفة عن مشكلة الطاقة في الأردن لدى طلبة الجامعات	الجامعات والهيئات المؤثرة
.4	قيام المنظمات البيئية بتنفيذ برامج لإشراك الطلبة في مشاريع ترشيد الطاقة على مستوى الجامعة	الجامعات والهيئات المؤثرة
.5	إضافة مواضيع حول الطاقة وترشيدها في المساقات الجامعية الإجبارية	الجامعات والهيئات المؤثرة
.6	قيام الوزارة بتقوية المناهج عن طريق إضافة مواد إثرائية لمناهج العلوم والدراسات الإجتماعية للصفوف الأساسية العليا	وزارة التربية والتعليم
.7	تنفيذ برامج تدريبية للمعلمين من قبل وزارة التربية بالمشاركة مع الهيئات التدريبية	وزارة التربية والتعليم، الهيئات التدريبية

إدارة النفايات في المنازل

	السلوك	الفئة المستهدفة
.1	الحد من تزايد حجم النفايات في المنزل من خلال: إعتماد أكياس القماش، شراء الأغذية الطازجة، اعادة استخدام المواد القابلة لذلك في المنزل، التبرع بألعاب الأطفال الزائدة عن الحاجة، صيانة أدوات المنزل	الأهل والأطفال ومدبرة المنزل
.2	البدء باعتماد الفرز المنزلي حسب فئتين؛ قابل وغير قابل للتدوير و رطب وجاف	الأهل
.3	تخصيص مكان داخل المنزل لتخزين بعض النفايات الجافة والعمل على تقليصها في المنزل	الأهل
.4	توفير حاويات للنفايات المفرزة	الأهل
.5	تنظيم حملات توعية تعتمد على "قصص نجاح" والتسويق الإجتماعي	الجهات الرسمية المحلية (أمانة عمان والبلديات و ASEZA)
.6	وضع النفايات المفرزة بشكل واضح يسهل وصول اللميم إليها	الأسرة
.7	عدم خلط النفايات الخطرة المنزلية مع النفايات المدورة	الأسرة
.8	توفير ألبسة واقية للليمة الذين يتعاونون معهم وأدوات مناسبة (قفازات ، عربة ، الخ)	القطاع الخاص (تجار الخردة)
.9	تسهيل المعاملات والإجراءات والإستثمارات في مجالات إعادة التصنيع (صندوق البيئة، قروض خضراء ميسرة، إعفاءات ضريبية.	الجهات الرسمية

المياه والشباب

	السلوك	الفئة المستهدفة
.1	إيجاد برامج تدريبية للمعلمين بهدف تعزيز وتطوير قدراتهم لكي يصبحوا قادرين على نقل التكنولوجيا والمعرفة التطبيقية والأخلاقيات البيئية للطلاب	وزارة التربية والتعليم
.2	إيجاد نظام حوافز مادية ومعنوية لتحفيز المعلمين على الممارسة والإستمرارية في تطبيق هذه النشاطات	وزارة التربية والتعليم، الإدارة المنزلية
.3	تدريب مهني لمجموعات طلابية تقوم على تدقيق وصيانة الشبكات المنزلية لتوفير المياه	متطوعين متخصصين في مجال الصيانة ، وزارة التربية والتعليم،

		المدرسة
.4	الوصول إلى أكبر شريحة من الشباب من خلال تفعيل المعرفة بواسطة الوسائل التكنولوجية	طلاب المدارس، المعلمين

المياه في المنازل

	السلوك	الفئة المستهدفة
.1	زيادة عدد مشاريع الحصاد المائي على المستوى المنزلي	مالكي المنازل وشركات الإسكان
.2	تبني نظام متابعة وصيانة دورية لشبكات المنازل	أرباب المنازل، أصحاب الاسكانات
.3	شراء وتركيب قطع توفير المياه	وكلاء البيع وأرباب المنازل

المياه والشباب

	السلوك	الفئة المستهدفة
.1	تحويل المناهج من مادة نظرية إلى مادة عملية تطبيقية من خلال مواد مساندة ومشاريع	المعلمين ومديري المناهج
.2	تطوير مشاريع تكاملية تتطرق إلى مشاكل المياه وحلولها	الطلاب والمعلمين
.3	طلاب فعالين في نشر التوعية في المجتمع المحلي	الإدارة المدرسية، المعلمين، متطوعين
.4	طلاب يمارسون عملية صيانة الشبكات في المدارس وتركيب قطع التوفير	
.5	مجموعات طلابية تنقل السلوك الإيجابي	
.6	تدريب المعلمين على أخلاقيات البيئة السليمة وإعداد مجموعات الممارسة	المعلمين، الطلاب، الإدارة المدرسية

كبار المستهلكين للمياه

	السلوك	الفئة المستهدفة
.1	تضمين دراسة الجدوى للمشاريع الجديدة وتقييم العائد الاقتصادي	المالكين وأصحاب المنشآت، المدراء الفنيين والفنيين أصحاب القرار بالمنشآت
.2	إدخال مبدأ البعد الاقتصادي للمياه في أساليب التدقيق المائي الحالية	
.3	تركيب واستخدام أجهزة توفير المياه	
.4	اعتماد برامج الصيانة الوقائية للمنشآت	