INVESTIGATION OF WATER RELATED PROBLEMS THROUGH EGYPTIAN YOUTH PARTICIPATION, EGYPT

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ABSTRACT:

To bridge the gap between education and the real water world, creation of a wider and deeper awareness of water issues presents a valuable opportunity. We can have a capacity building impact on the Egyptian people by influencing the next generation's attitudes and actions about water use. So, there is an urgent need to get Egyptian youth involved in Water Related Problems and issues. The study do this by teaching them scientific inquiry, showing them appropriate, sustainable water technologies, and helping them develop and recommend sustainable water policy changes. The Paper presents Water Integrated Investigation Approach for Water Related Problems that has conducted in 4 phases. A Case study for Participating of Egyptian Youth in Al-Daqahliyah Governorate ecosystem as a whole has been addressed. Water Related Problems have been explored and identified. The Paper concludes that Participants have demonstrated how Youth can be instrumental in rising water awareness and water resources stewardship within their own communities, and they can effectively influence national water, land and environment policy changes.

Keywords: Water related problems, Youth Participation, Water policy changes, Egypt

1. INTRODUCTION

In Egypt, a rapidly growing population (the largest in the Arab world), limited arable land, and dependence on the Nile all continue to overtax water, land and environmental resources and stress society. The Egyptian government has struggled to ready the economy for the new millennium through economic reform and massive investment in communications and physical infrastructure.

Al-Daqahliyah is an Egyptian governorate lying in the Nile Delta northeast of Cairo. Al Mansoura - the capital of Al-Daqahliyah - lies on the east bank of the Damietta branch of River Nile, in the delta region. Irrigation canals and drains (primary, secondary, tertiary) components include both appurtenances (for delivering and distributing water to farmlands, including pumping flood controls, and other components), and farming inputs (equipment, animals, fuel chemicals, seeds etc).

The water problems contain: Agricultural land being lost to urbanization and windblown sands; increasing soil salination due to environmental side effects of Aswan High Dam; desertification; oil pollution threatening water resources, beaches, fish and marine habitats; other water pollution from agricultural pesticides, raw sewage, and industrial effluents; very limited natural fresh water resources away from

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the Nile, which is the only perennial water source; and rapid growth in population overstraining the Nile and natural resources.
An appraisal of the challenges that affect sustainability and productivity of the land use has been addressed in [1], sustainable water development and management has been discussed [2]. Also, assessing the effects of weather conditions on physical activity participation using objective measures [3], Cultural diversity issues in biodiversity monitoring [4] have been discussed. Participation and sustainable management of coastal lagoon ecosystems [5], Approaches to integrated water resources management [6], High Aswan Dam, vital achievement fully controlled [7] have been discussed. Participation in after-school physical activity associated with increased total physical activity [8], Fish, flood plains, and food security [9] have been discussed.

Water and sustainable development [10], the role of effective communication to enhance participation in screening mammography [11] have been discussed. Surveys on the Iranian coastal planning strategies [12], Mekong River Basin diagnostic study [13] have been discussed. Planning and management of water resources in river basins [14], Design and optimization of water quality monitoring networks [15], Groundwater: a threatened resource [16] have been discussed. Operational management system for the drainage network [17], Public health and the environment: what skills for sustainability literacy - and why? [18], Assessing biodiversity status and sustainability [19] have been discussed.

2. METHODOLOGY

Investigation methodologies are progressively changing from a static, piecemeal approach to one that reflects the dynamism of nature and the environment. Consequently, the trend is away from mere listing of potential impacts towards more complex modes whereby the methodology can identify feedback paths, higher-order impacts than merely those apparent. In short, the methodological trend is approaching an overall water and environment perspective. Numerous techniques and methods have been developed for investigating and evaluating and presenting the effects of proposed and ongoing developmental activities. Investigation criteria have included the following questions: Whether the activity will result in the loss of precious/irreplaceable water resources and if so how this is justified? Whether the activity sacrifice long-term water resources values in favor of immediate gains? Whether the activity will create water issues which are likely to be highly controversial and if so, how this will be managed? Whether the activity will endanger species survival and if so how this unjustified? Whether the activity will establish a precedent for future actions involving sensitive water issues? Whether activity while in itself not causing serious impacts? And whether activity will be related to other actions where the accumulated total effects could be serious? Each of the methodologies for the investigation has advantages and disadvantages.

Usefulness is largely a matter of choice and judgment of the analyst. Still there are some general objective criteria for selection and these are stated below: such as (a) Simplicity, (b) time and budget constraints, (c) Flexibility, (d) Comprehensiveness, (e)

Specificity, (f) Risk, (g) Objective criteria, (h) Depth of analysis, (i) Alternative comparison and (j) Public involvement.
Information seeking strategies include but not limited to Brainstorm possible information sources (newspapers, popular journals, reference books, websites, and people), and Scan Internet resources. Participatory methodologies (Youth-centered learning, open ended questions, and informal interviews) to build capacity and empower Egypt's youth to make changes in their daily life also deeply used in conducting the program.

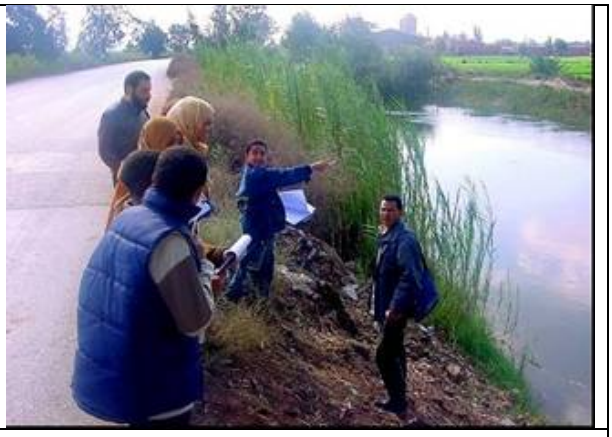



Figure 1 Brainstorm Possible Information Sources

3. WATER INTEGRATED INVESTIGATION APPROACH

Water Integrated Investigation Approach for Water Related Problems through Egyptian Youth Participation has conducted in 4 phases. Each of the 300 participants has been seen [10] times:

Introduction phase:
[1] visit to meet participants, trainers, and administrators; explain Investigation of Water Related Problems mission and vision; outline project schedule; assess classroom dynamics; gauge participant/trainer interest and motivation.

Preparation phase:

[2] visits to assure participant input; prepare for field study; maximize field benefits by ensuring all participants have a baseline level of scientific knowledge and background.

Water Facilities phase:

[3] visits to water laboratory facilities and conduct discovery experiments.

Field phase:

[3] visits to allow participants to discuss and debrief from this unique field learning experience; allow additional questions; investigate further avenues for study.

Final assessment phase:

[1] visit as a part of Impact Assessment Plan.

Figure 2 Integrated Investigation Approach for Water Related Problems

4. OUTCOME OF FIELD PHASE

The following Water Related Problems have been explored and identified:

4.1 Water Quantities and Qualities

A- Problem

The problems that have been explored and identified are concern of both water quantity and quality, Availability of water supply downstream communities, the effects of low flow augmentation, Consideration of downstream facilities (such as irrigation canals and drains) include provision for connections/diversions for connecting new supply systems which are likely to be needed, Effects of groundwater pollution, alterations in groundwater table, leakage from canals and drains. Of the total irrigation water delivered to the farm fields, some 20 to 40 % leaves the fields as surface run-off. The added constituents will tend to damage downstream beneficial water uses because of increased nutrients causing eutrophication and increased toxicity.

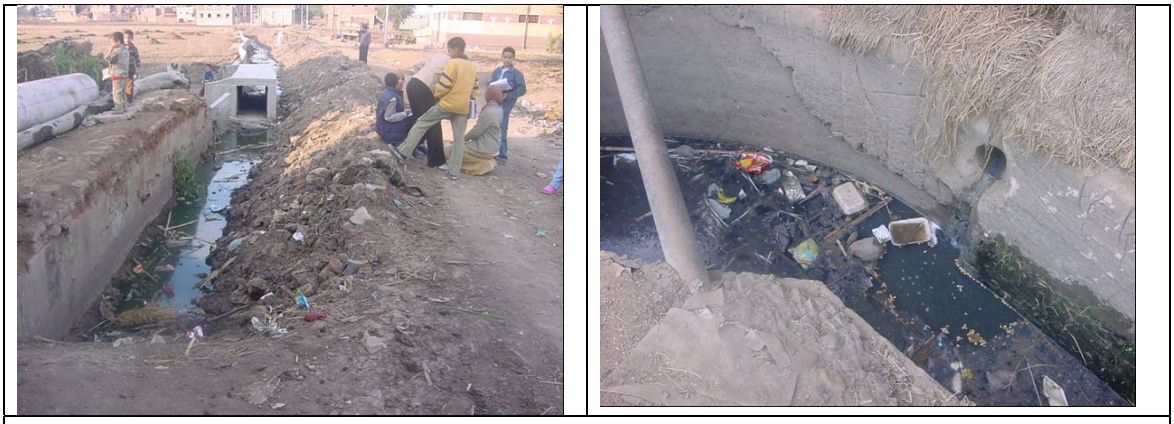


Figure 3 Water Quantities and Qualities Problems

B- Solution

Improvements in drinking-water quality through household water treatment, such as chlorination at point of use and adequate domestic storage should be defined. Considering the present status of the quality of the irrigation water supply, consideration must be given to possible alterations from future stream water used, and Availability of water supply downstream communities. The surface run-off, percolates through the soil to the groundwater, or can be removed by engineered drainage systems. Providing groundwater development or alternative water supplies, to mitigate the loss of degradation of water quality or reduced flows of traditional downstream water supplied.

Sanitary preparation is required to ensure adequate water quality and sanitary safety of the water storage as a water-supply source. All sanitary preparation efforts should be completed. Sanitary authorities are responsible for anti-epidemic measures to control pests inhabiting damp areas which are vectors of water-borne diseases (malaria, encephalitis, etc.). Special attention must be paid to complete clear-up and necessary treatment of the former sites of domestic waste dumps, lavatories, livestock facilities, slaughter-houses, plants for utility waste processing, tanneries, chemistry plants, scrap dumps and other industrial refuse areas. All the graveyards and livestock refuse burial grounds are to be re-buried or fixated according to the effective standards.

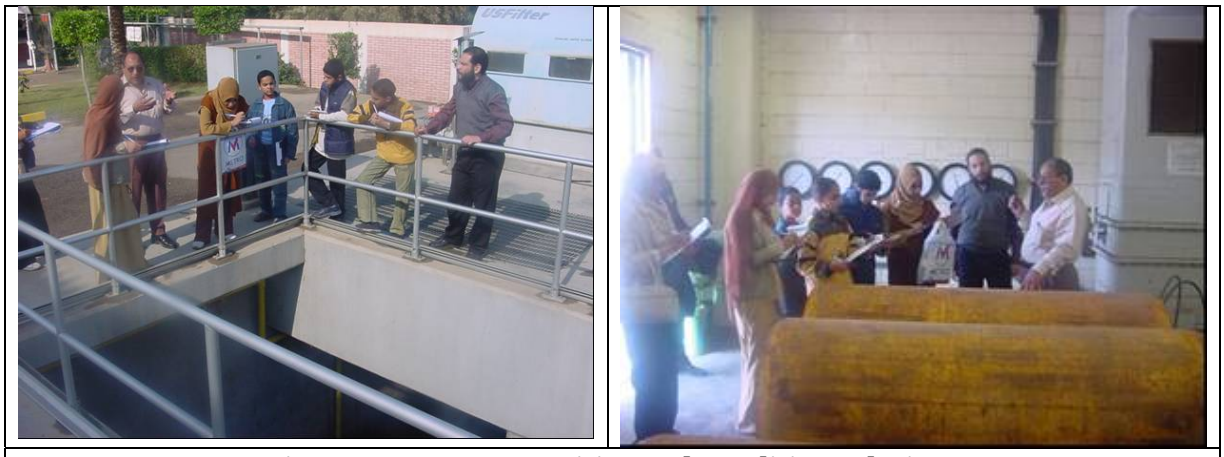


Figure 4 Water Quantities and Qualities Solutions

4.2 Soil Stalinization

A- Problem

Soil Stalinization and water logging from inadequate drainage facilities are examples of such problem. The irrigated area is severely affected.

Waterlogging may be caused not only over-irrigation but by seepage losses from unlined canals. Over-irrigation may also leach nutrients, especially nitrates, from the root zone. Waterlogging is also due to the lack of drainage: often farmers are reluctant to dig drainage ditches in their fields, because they believe that it is not urgent or that it is a waste of time and effort with the result that even if the tertiary and secondary drains are in place, the network does not collect the excess water from the fields.

Soil salinization may occur in any irrigation system but it is common in semi-arid zones and is caused by limited rainfall of freshwater available for flushing the soil. Even with irrigation water of good quality (low salinity, say 200 ppm), the amount of salt added to soil per year with normal water application can be 2 tons per hectare. Soil alkalinization, is caused by alkaline groundwater or irrigation water, i.e. waters with excess sodium/calcium ratios, resulting in progressive decrease in soil permeability.

Waterlogging and salinity have reduced yields of major crops on 20-30 % of the irrigated areas. Water logging has a detrimental effect on crop yields and often leads to soil Stalinization.

B- Solution

Provision of adequate drainage and/or flushing, which must be an integrated part of the plan or budget can mange most of these problems. Attention to drainage should be a key element in irrigation system design.

4.3 Public Health

A- Problem

The pollution may expand the transmission of human diseases and also to increase the density of vectors in the vicinity. Especially in subtropical climates, the incidence of water borne diseases may rise significantly with the creation of a large polluted water body.

Two of the water-related diseases, diarrhoea and malaria, ranked 3rd and 4th place in the cause of death among Youth under 5 years old, accounting for 17 % and 8 % respectively of all deaths (WHO, 2005: 106).

B- Solution

The main considerations about vector-borne diseases should include provision for necessary control measures (including continuing funding as part of activity operation and maintenance.Creation of favorable habitats for parasitic and water borne diseases - Such as malaria, and river fluke infections – is very dangerous. This has been especially the case with certain irrigation activities. Replacement of simple traditional irrigation practices with perennial schemes has often led to a considerable increase in the incidence of such diseases.

Health maintenance and sickness prevention planning should be assured early in the course of planning. Altering hazards of water, oriented diseases in the region, proposed corrective measures, and hazards expected should be guaranteed. Plans for provision of adequate community sanitation facilities in villages living and minimization pollution, and other anticipated public health/ sanitation problems should be defined.

Improvements in drinking-water quality through household water treatment, such as chlorination at point of use and adequate domestic storage, can lead to a reduction of

diarrhoea episodes by between 35 and 39 per cent, while hygiene interventions, such as hygiene education and promotion of hand washing, can lead to a reduction of diarrhoeal cases by up to 45 % (WHO/UNICEF, 2005: 13).

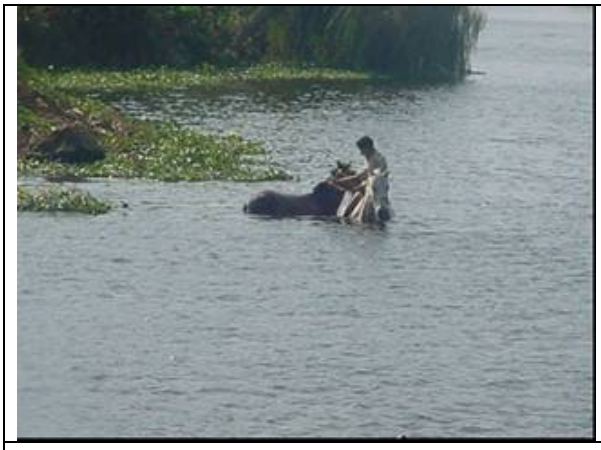


Figure 5 Public Health Problems and Solutions

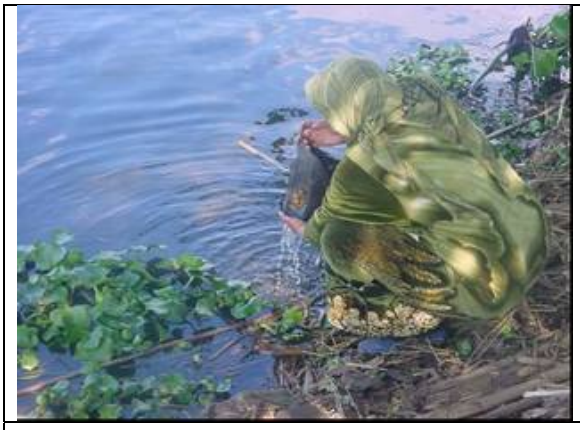
4.4 Aquaculture

A- Problem

The important point is that aquaculture depends critically upon the availability of a freshwater supply throughout the year, hence the availability of this can support marked increase in downstream aquaculture in regions where the available flows are very limited in the dry season.

B- Solution

Potentials for improved downstream aquaculture resulting from low flow augmentation (including needs for aquaculture to offset downstream fishery losses) should be defined. A fisheries development scheme including provision of technology, infrastructure, and marketing may be required to mitigate the loss.



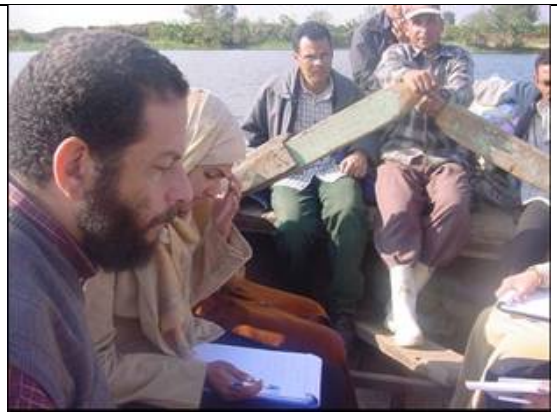


Figure 6 Aquaculture Problems and Solutions

4.5 Aquatic Weeds

A- Problem

Serious difficulties have been encountered from weed growth in the irrigation and drainage network. The spread of weeds has a number of secondary impacts, notably water losses through evapotranspiration. Weed clearing may cost millions of dollars, and sometimes the effects of the remedy may be even more destructive and hazardous than the weeds themselves. The use of herbicides is an example.

B- Solution

Several ecological aspects related to flora and fauna were identified. For example, an ecological aspect that resulted from Aswan High Dam construction in certain regions is that of the spread of aquatic weeds.

Water resources specialists should improve continuously their knowledge on the negative effects of water resources development on the environment, and plan such measures associated with water resources activities, which will eliminate or minimize these effects.

4.6 Public Awareness and Technology Transfer

A- Problem

Farmers often tend to over-irrigate, believing, wrongly, that if a little water is good, more should be better. This trend is stronger when the cost of water is subsidized or even free and where the water supply is abundant. The result is not only a waste of water, but also waterlogging of the soil.

Farmers generally have very limited financial reserves and will not be willing to risk there in trying out new/unproven technologies. Farmers generally will be uninterested in proposals with long-term objectives because most of them are pressed to meet short-term financial needs.

The public awareness of issues related to the ‘Water for Life’ theme are not encouraged, including the organization of conferences, seminars, expositions and other such public events. Also, lack of local participation, Education/building awareness, Human resources development/training, Institutional strengthening and Arrangements for Capacity-Building and Technology Transfer are major challenges.

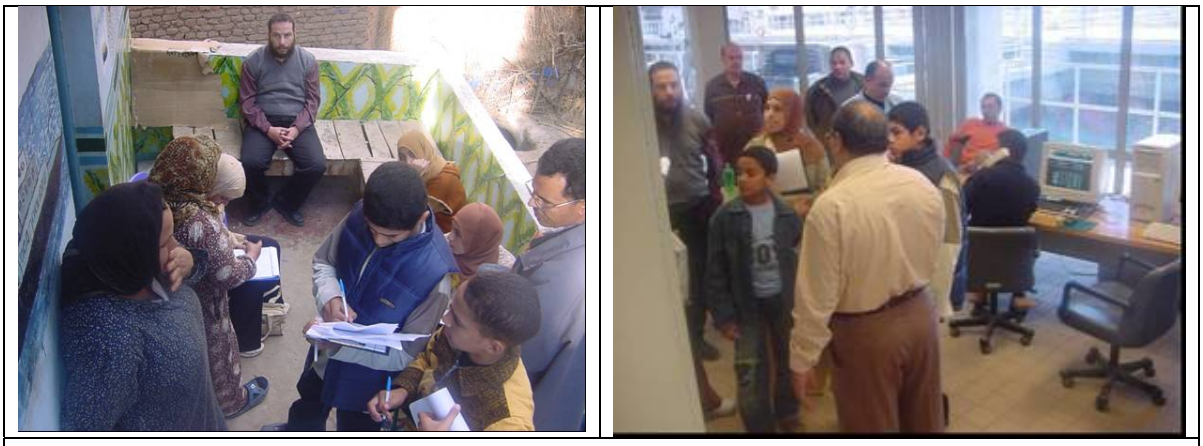


Figure 7 Public Awareness and Technology Transfer Problems and Solutions

B- Solution

Establishment of farmer organizations for maintaining the canals and appurtenances and achieving equitable water distribution should be assured. Arrangement for technical guidance on new appropriate technologies, and other matter of communal interest should be assured. All activities that promote public awareness of issues related to the 'Water for Life' theme should be encouraged, including the organization of conferences, seminars, expositions and other such public events. Arrangements for Capacity-Building and Technology Transfer such as Human resources development, Building awareness and Institutional strengthening, including local participation should be secured.

4.7 Quality-of-life values

A- Problem

The following issues are of most importance: deficient in programs of socio-economic surveys for assessing the social/economic situation of the rural population in the region affected by the pollution, short of background data to be used in planning so that the affected population can share in the benefits. No realistic Plans for improving the welfare of the affected rural populations, that necessary for government planners to ensure some level of equity in distribution of benefits are prepared.

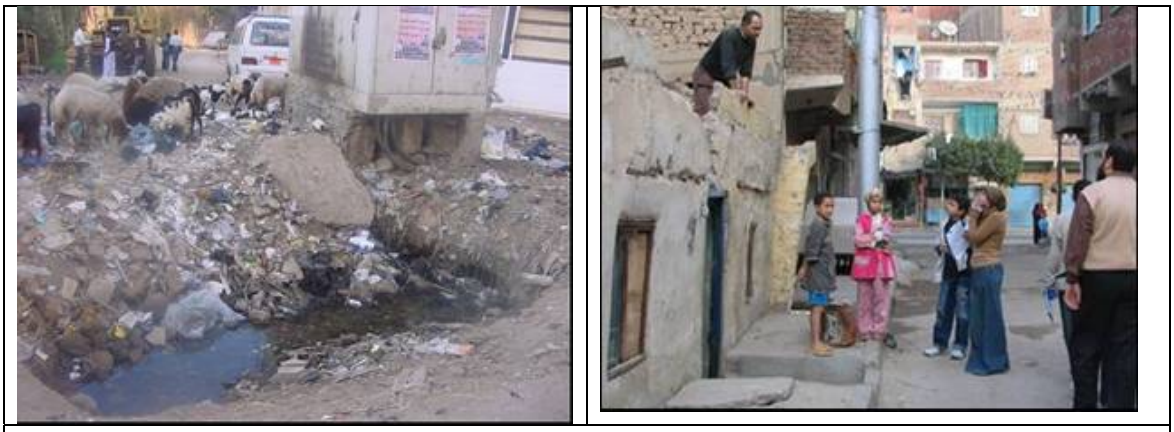


Figure 8 Quality-of-life Values Problems

B- Solution

The successful management of socio economic considerations requires their evaluation in a comprehensive perspective, which integrates issues, potentials and objectives of regional and social development. Activity concept and design should be assessed within the context of overall economic development and regional resource planning strategy.

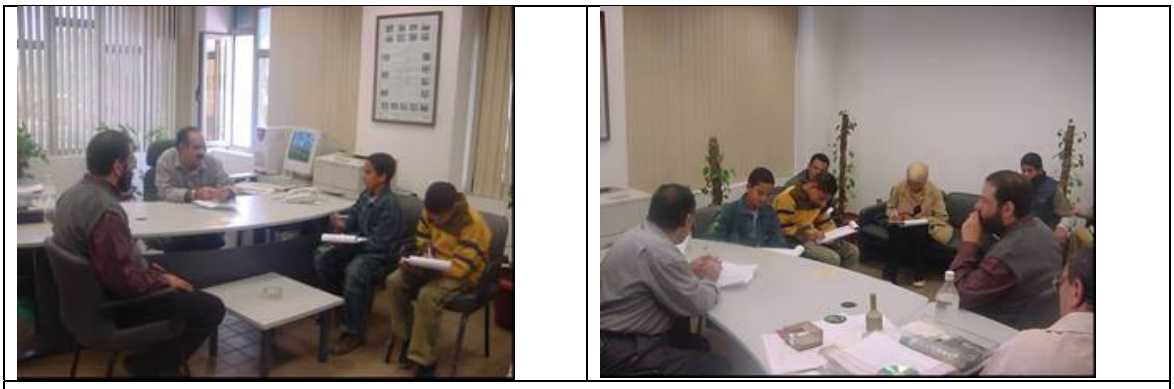


Figure 9 Quality-of-life Values Solutions

5. OUTPUTS

Participants have developed their skills in problem solving and analytical proficiency; they have been better enquirers and risk takers. They have gained self-confidence and developed scientific investigative learning skills. They have a holistic comprehension of science, environment, and natural resources conservation. They have gained an understanding and sensitivity to the unique natural environment of Egypt and the environmental problems facing Egypt today and tomorrow. They have pursued further study (and possibly careers) in environmental sciences.

- Most of Participants are capable of preparing suggestions for national policy changes to the Ministries of Education and/or Water Resources and Irrigation.
- 20 participants making up the "core group" are extensively trained in the advanced relevant water issues, and possible solutions such that they can become participant-trainers.
- 150 Participants have become empowered to diffuse the water knowledge back within their village and school.
- 10 schools have been joined to water awareness curriculum.
- Approximately 7,500 citizens (parents, community leaders, agriculturists, etc.) have been informed about water awareness via program forums and educational sessions.
- 30 local NGOs have participated in the water awareness program and continue to disseminate the program within other governorates.
- Participants have demonstrated how Youth can be instrumental in rising water awareness and water resources stewardship within their own communities, and they can effectively influence national water, land and environment policy changes.

6. IMPACT ASSESSMENT

A critical part of the test-pilot project is Impact Assessment. An Impact Assessment Plan has been initiated at the project's onset. An integrated, comprehensive, and sequenced assessment plan that can capture the impact of project has been developed. The assessment have measured and evaluated: (1) overall water knowledge performance of participants; (2) participant enthusiasm in the study of new water and environment topics; (3) trainer's development and teaching strategies; (4)

demonstration of classroom changes; (5) participant achievements and cognitive skills, critical thinking, and problem solving. male and female participants have been a part of the program.

Gender equality is an educational development objective because inequalities between women and men often result in women having less access to resources and decision-making power. The assessment tables and figures give a clear, transparent overview of our achievements as well as the zones of potential and immediate changes that should be implemented to make our program of activities more relevant to other Egyptian governorates.

7. CONCLUSIONS

The Participants have demonstrated how Youth can be instrumental in rising water awareness and water resources stewardship within their own communities, and they can effectively influence national water, land and environment policy changes. They have been capable of change National Policy to produce educated youth that become "agents for change, Promote dialogue between Egyptian Ministry officials and Egyptian youth and Empower youth to appeal the Ministry for national policy changes. Also, they have been capable of change environment, to promote changes that meet UN Millennium Development and Water Decade goals for Egypt, research and explore five water-related ecosystems in Egypt (Northern Lakes, Lake Nasser, Delta, Upper Egypt, and Desert), Raise the level of education and awareness about water issues in participants, parents, schools, and within their communities, Highlight water conservation methods, and possible environmentally conscientious and sustainable solutions, and Challenge participants to analyze and reflect upon personal and community behaviors required for water improvements in their daily lives. In addition, the Participants have demonstrated how Youth can strengthen Local Initiatives, they have used participatory methodologies to build capacity and empower Egypt's youth to make positive changes in their homes, schools, communities and in their daily life. By working with existing NGOs, local stakeholders, and water related institutions, and giving them support and current technology to build capacity, they become more responsive to local needs, and strengthen networks of local support to solve water problems in their communities. Thus, the overall goal of enhancement of water knowledge among the Egyptian's youth, is more equitably distributing the benefits of water, land and environment resources, and also economic growth.

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