

Task Order No. 832

USAID Contract No. PCE-I-00-96-00002-00

# **Egyptian Environmental Policy Program Program Support Unit**

## **WORK ASSIGNMENT REPORT**

### **Tranche 1, Objective 5**

#### ***International Experience with Economic Instruments: Candidates for Transfer to Egypt?***

***Dr. Glenn Morris***

February 2001

PSU-39

for  
**U.S. Agency For International Development  
Cairo**

by  
**Environmental Policy & Institutional Strengthening  
Indefinite Quantity Contract (EPIQ)**

**A USAID-funded project consortium led by International Resources Group, Ltd.**

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## FACT SHEET

**USAID Contract No.:** PCE-I-00-96-00002-00  
Task Order No. 832

**Contract Purpose:** Provide core management and analytical technical services to the Egyptian Environmental Policy Program (EEPP) through a Program Support Unit (PSU)

**USAID/Egypt's Cognizant Technical Officer:** Holly Ferrette

**Contractor Name:** International Resources Group, Ltd.

**Primary Beneficiary:** Egyptian Environmental Affairs Agency (EEAA)

**EEAA Counterpart:** Eng. Dahlia Lotayef

**Work Assignment Supervisor:** Harold van Kempen

**Work Assignment Period:** February 2001

## Preface

Through competitive bidding, the U.S. Agency for International Development (USAID) awarded a multi-year contract to a team managed by International Resources Group, Ltd. (IRG) to support the development and implementation of environmentally sound strategic planning, and strengthening of environmental policies and institutions, in countries where USAID is active. Under this contract, termed the Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ), IRG is assisting USAID/Egypt with implementing a large part of the Egyptian Environmental Policy Program (EEPP).

This program was agreed-to following negotiations between the Government of the United States, acting through USAID, and the Arab Republic of Egypt, acting through the Egyptian Environmental Affairs Agency (EEAA) of the Ministry of State for Environmental Affairs, the Ministry of Petroleum's Organization for Energy Planning, and the Ministry of Tourism's Tourism Development Authority. These negotiations culminated with the signing of a Memorandum of Understanding in 1999, whereby the Government of Egypt would seek to implement a set of environmental policy measures, using technical support and other assistance provided by USAID. The Egyptian Environmental Policy Program is a multi-year activity to support policy, institutional, and regulatory reforms in the environmental sector, focusing on economic and institutional constraints, cleaner and more efficient energy use, reduced air pollution, improved solid waste management, and natural resources managed for environmental sustainability.

USAID has engaged the EPIQ contractor to provide Program Support Unit (PSU) services to EEPP. The PSU has key responsibilities of providing overall coordination of EEPP technical assistance, limited crosscutting expertise and technical assistance to the three Egyptian agencies, and most of the technical assistance that EEAA may seek when achieving its policy measures.

The EPIQ team includes the following organizations:

- Prime Contractor: International Resources Group
- Partner Organization:
  - Winrock International
- Core Group:
  - Management Systems International, Inc.
  - PADCO
  - Development Alternatives, Inc.
- Collaborating Organizations:
  - The Tellus Institute
  - KBN Engineering & Applied Sciences, Inc.
  - Keller-Bliesner Engineering
  - Conservation International
  - Resource Management International, Inc.
  - World Resources Institute's Center For International Development Management
  - The Urban Institute
  - The CNA Corporation.

For additional information regarding EPIQ and the EEPP-PSU, contact the following:

**United States of America:**

EPIQ Prime Contractor  
 International Resources Group, Ltd  
 1211 Connecticut Ave, NW  
 Suite #700  
 Washington, DC 20036  
 Telephone: (1-202) 289-0100  
 Facsimile: (1-202) 289-7601  
 Contact: Douglas Clark  
 Vice President

**Egypt:**

EEPP-PSU  
 International Resources Group, Ltd  
 21 Misr Helwan Agricultural Road  
 Office 62, 6th Floor  
 Maadi, Cairo 11431  
 Telephone: (20-2) 380-5150  
 Facsimile: (20-2) 380-5180  
 Contact: Harold van Kempen  
 Chief of Party

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## What are Economic Instruments?

The definition of economic instruments has varied with author and over time. Most broadly, an economic instrument is a policy that protects the environment or public health by making an individual, enterprise, or public entity pay for use of an environmental service.<sup>1</sup> The environmental services themselves can vary. They can range from the capacity of an airshed or water body to absorb a polluting substance to activities that handle or treat a waste stream to reduce to reduce pollution or a health hazard<sup>2</sup>. Examples of such economic instruments are:

- an emission charge per ton of particulate matter emitted to the air,
- a surcharge on production of a product that is toxic (this discourages both consumption and, hence, production of the product),
- publication of information about toxic air emissions of each industrial firm in a public forum,
- a deposit on a purchased item with a return of some or all of the deposit if the used item is properly disposed, or
- reduction of a subsidy on diesel fuel.

A fundamental rationale for the use of economic instruments is the polluter pays principle (PPP). This principle has been "enshrined" as fundamental to environmental policy by international organizations (OECD, EU), individual nation states, and local governments in both developed and developing countries. Once again, the idea is to connect a financial burden with each instance of polluting behavior in an attempt to discourage that behavior.<sup>3</sup> This is the most efficient and effective way to discourage activities that would otherwise lead to pollution and increased threats to health. From the examples cited above:

- The entity that emits particulates is the polluter and he/she pays the emission charge per ton of particulates. If effectively enforced, this charge directly discourages particulate emissions; the less the user of the air shed pollutes the less they have to pay for the use of the air sheds environmental "carrying capacity".

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<sup>1</sup> There are narrower and broader definitions of economic instruments. Here we apply a very broad definition and don't necessarily exclude policies that, for example, have a major revenue (as opposed to incentive) component or that have only an indirect link between the initial payment and the agent or institution whose behavior we aim to change.

<sup>2</sup> The payment for use of an environmental treatment service, such as wastewater treatment, is a little tricky because the incentive can have adverse consequences. For example, payment for the full cost of the amount of wastewater treatment service used encourages less use of that service. This can mean changes in behavior that reduce effluent in environmentally friendly ways e.g., production techniques that produce less effluent per unit of output. It can also mean, however, that users have greater incentive to by-pass the treatment system and discharge directly into canals or lagoons. This is but one example of how, given the powerful motivation of financial incentives, care must be taken to gauge the full range of behavioral responses and their economic and environmental consequences.

<sup>3</sup> In general, this is best done by policies that tie the financial motivation for pollution reduction as directly as possible to the individual or organization that actually generates the pollution or used the environmental service. Sometimes, however, policies with less direct linkages are advisable given issues of transactions costs, legal, and institutional constraints.

- The cost of production and the price of the toxic substance increase due to the product charge and users of the toxic substance pay more for each unit of toxic substance used. The user of the toxic substance is discouraged by the higher price from using this substance. The less of the toxic product used, the less the emissions (all other things equal) and the greater the cost savings to the user from emission reductions.<sup>4</sup>
- The publication of information on risks from environment or health-threatening emissions along with the source and amount of these emissions, encourages employees, neighbors, and consumers to modify their behavior in ways that increase the cost to the polluting firm or organization. Workers demand higher wages and/or better working conditions. Neighbors demand better protection of their health or compensation for damages. Consumers reduce consumption of products produced by environmentally damaging processes (the process becomes one of the attributes of the product).<sup>5</sup> As a result of these current or anticipated costs, firms are encouraged to reduce their toxic air emissions.<sup>6</sup>
- The deposit of the deposit-refund system acts as a guarantee that the user of the good will dispose of the product properly. That user that does meet the conditions for "return" or proper disposal receives all or some of the deposit back. The more of the good returned for proper disposal, the greater the corresponding refund to users.
- Decreasing the subsidy on diesel fuel will increase the cost of production and the price to diesel users. Diesel users will take steps to reduce diesel consumption and thus reduce emissions from combustion of diesel fuel. The policy operates like that of the product charge discussed above except that the cost and price increase occurs through a subsidy reduction rather than imposition of a tax.

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<sup>4</sup> The actual price and consumption effects will vary with the structure and performance of the affected markets. Issues such as market concentration, the availability of substitutes, etc. are important when considering the specific outcome of such a policy.

<sup>5</sup> Other linkages between the policy and the behavior of polluters are also hypothesized. Although emission or effluent reductions have been correlated with such policies, the mechanisms through which the such policies work have not been identified or ranked (Shaked, et. al., 2000).

<sup>6</sup> In this instance, the incentive mechanism is indirect. The incentive mechanism works on the polluter through changes in behavior of others who are more directly affected by the pollution.

## Transfer of Economic Instruments: Context and Implementation are Critical

The international economic instruments we discuss here may or may not be appropriate for transfer to Egypt. Their use in another country is no guarantee that they will work successfully in Egypt. Often, we don't even really know very clearly how successful they have been in countries in which they have been applied (Barde, 1997). As both suggested above and demonstrated by numerous case studies of economic instruments, the particulars of the incentives created, the markets affected, and the institutional conditions surrounding the policy are critical to whether an economic instrument can be adopted successfully. This argues for consideration of the economic instruments discussed below with the following questions in mind:

- What must we modify in the design of the economic instrument to make it work in Egypt?
- With these modifications, what are the chances that it will succeed?
- How can we implement the design so as to protect ourselves from serious mistakes?
- What processes will allow us to tune and refine the instrument with experience so that we will get the most out of it?

The following list has been selected to emphasize those EIs that are more appealing on several counts. Some appear to be more "self regulating", requiring less administration, monitoring, and enforcement to work well. Others build on economic instruments, or at least payment systems, that already are commonplace in Egypt. Some are more typical of developing countries. Finally, some address pollution problems that are particularly important in Egypt as reflected, for example, in existing programs and the NEAP.<sup>7</sup>

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<sup>7</sup> In effect, we use these criteria as surrogates for the "net benefits" criteria that identifies policies that are more efficient and, therefore, economically justified. This criteria is widely regarded by economists as the best basis for policy evaluation and officially "blessed" in the US as the correct basis for Regulatory Impact Analysis and adopted widely if, sometimes indirectly (Smith and Vos, 1997). Once good candidates have been selected, we can examine the specific benefits and cost of different policy designs.

## **Some Economic Instruments to Consider for Egypt**

This list is compiled because these instruments meet one or more of the criteria above. We do not necessarily recommend these economic instruments. We simply offer them for consideration and encourage you to reflect on ways in which they could be made workable and effective in Egypt.

Some of the candidates on this list have already been used as a basis for filling out an Economic Instrument Description (EID) form. This is noted beside the title and one can go to the EID for an extended characterization of the problem and the EI design.

### **Deposit-Refunds on Elements of the Solid Waste Stream**

Deposit-refund schemes for solid waste apply to products that, after use, pose some environmental or health threat if improperly or poorly processed or disposed. A deposit is collected at the time of sale. Some portion of the deposit is returned to the user after they return the used product to the appropriate location for disposal. This provides a direct financial incentive for users to return the used product for proper processing and/or disposal. It is important that the portion of deposit that is returned be large enough to justify the effort of most of the users or higher than the next best use of the used product. Amounts in excess of the amounts refunded may be designated for program administration, enforcement, subsidies for disposal facilities, etc.

Design choices include: the definition of the product, the size of the deposit, point of collection of the deposit, any marking of the product upon payment of the deposit or any receipt system, the size of the return, the point of return, the use of deposits in excess of the refund. Deposit-refund systems can be administered by responsible government entities, but they can also be set up and administered by the product manufacturers or other business entities. EEAA can encourage institutions and enterprises to set up these systems and government entities. It can also assist by encouraging legislation or regulations that support and sanction deposit-refund systems.

### **Used Vehicle Batteries**

In many developed countries used vehicle batteries are banned from the conventional waste stream and from disposal in landfills and solid waste incinerators. The used product is distinctive in its combination of attributes: it is mostly made of lead and lead has significant commercial value that is recoverable from the product and this lead and other components of the used product are very toxic and durable in the environment. In many countries, programs have been designed to encourage collection and environmentally protective processing vehicle batteries. One popular approach is the deposit-refund program.

Egypt imposes a surcharge on vehicle batteries when they are purchased. This could become the basis for a deposit program. We need to learn more about the current program to determine how the current system of collection functions and how it integrates with the lead smelting industry described below.

## Used Vehicles and Used Vehicle Tires

Sweden and several other OECD countries have deposit refund systems on automobiles. The Swedish program has been working since 1975. This is levied on all vehicles subject to the sale tax, so it may be levied multiple times depending on how often the vehicle changes owners. The owner gets a payment when the car is handed over for scrapping.

## Used Beverage Containers (EID)

Many countries have deposit-refund systems on beverage containers. Most are privately organized, usually by beverage or container manufacturers, because the containers can easily be recycled and reused. Some are mandated by the government e.g., in the US many states have mandatory deposit requirements on glass and plastic bottles and metal cans.

In Egypt, privately established deposit-refund systems for glass beverage containers have been operating for many years. However, with the advent of plastic bottles and metal cans, glass containers have a much smaller share of the beverage container market and the deposit-refund system is being phased out. The producers do not have as great a need for glass containers and the program has high fixed costs. In its place, scavengers recover aluminum cans but many plastic and metal containers are simply littered or disposed as solid waste.

If littering is the principle environmental problem, a deposit-refund system that is either mandated or encouraged will be an effective and perhaps efficient policy. If, however, the problem as seen as a need for better solid waste collection and disposal, then the deposit refund system is likely to be the wrong tool. Intervention (whether an EI or not) should be with respect to waste collection and disposal.

## Construction Debris Removal Deposit-Refunds (EID)

When obtaining a construction or demolition permit, firms in Egypt are required to make a security deposit that is meant as a guarantee that the debris from the construction site is removed and properly disposed.<sup>8</sup> The amount of the deposit is calculated per meter length of the façade and is therefore loosely tied to the amount of construction debris produced. This deposit is supposed to be refunded when the site has been cleared of all construction and demolition debris. Whether the fee is too small, or the practice of refunding is compromised, this deposit-refund system is not currently effective. The municipality's Cleansing Fund keeps the deposit and construction sites or their immediate vicinity are littered with debris. While designed as an economic instrument, this fee really functions as a tax on construction and demolition. The fee needs to be raised and/or refunding enforced.

We have not surveyed this topic internationally, but observe that in the US this problem is usually dealt with at the local level through command and control systems (building inspectors) and the permitting process. Debris must be removed for the building inspector to approve progress under the building permit and a clean site is required to obtain an occupancy permit.

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<sup>8</sup> One might also call this economic instrument a performance bond. The bond is the deposit and the performance is the clearing of debris.

## **Industrial Emissions Charges on Industrial Pollution**

These EI impose emission charges on a wide variety of pollutants from a wide range of industrial sources. They have been used, with varying effectiveness, in developed countries i.e., SO<sub>2</sub> in Denmark, and in developing countries e.g., all the countries of the former Soviet Union and allied countries and China (Yang, Cao, and Wang, 1997). These emission charges have not been historically effective in central and eastern Europe and Eurasia. While there may also have been difficulties with monitoring and enforcement (in most instances the charges are based on self-reported information), the principle difficulties stemmed from the fact of state ownership (before 1990) and low rates (with no inflationary adjustment) in more recent periods, c.f. Bluffstone and Larson (1997) and Morris et. al. (1997) in that volume.

[Bob, what would you like to say about China here or under emission trading below?]

### **Emission Charge on Particulates Emitted by Lead Smelters - EID**

This is an important source of particulates that are particularly harmful of health, especially given the current location of these facilities (in proximity to large population centers). A related problem is the informal smelting that apparently is occurring (common in other developed countries as well). Given the avowed intention of the sector to build large, modern and less polluting facilities, the EID suggests consideration of a program of an emission charge combined with use of revenues for monitoring and enforcement and control of illegal (informal) smelting.

### **Emission Charge on Particulates Emitted by Iron Foundries - EID**

This is an important source of particulates but the actual health threat has not been thoroughly evaluated. Conditional on such an examination, the EID suggests that

## **Industrial Effluent Charges**

Malaysia, the Philippines, Colombia, and China all have implemented economic instruments (effluent charges) to improve water quality.

### **Effluent Charge on Discharges to Water Bodies**

Colombia has had a effluent charge on industrial and municipal discharges to water bodies (Ambrus, 2000). The system is administered by regional environmental authorities but was designed by staff of the State Environmental Agency. The design began with very low charges initially but included an increase every six months. From the very outset they had apparently had the support of private industry in the region where this was first implemented and industrial effluents have been reduced substantially. Revenues have been used to improve regional monitoring of effluent discharges. The municipalities, who are also subject to the effluent charges, are resisting the policy.

### **Effluent Charge on Discharges to Wastewater Treatment Facilities in the New Industrial Cities**

Such charges are widespread in the developing world whenever wastewater treatment systems have been constructed. The principle issue is the design of the charges and whether

they are high enough to cover something like the costs of the system. This has been discussed and targeted by for examination by FINBI.

## **Solid Waste Service Fees**

Most localities have a formal solid waste service sector; all have an informal sector. Often the formal service in developing countries is private and selective, sometimes it is public and universal. These approaches can coexist, hybrids often arise depending on the type of waste producer (construction/demolition, industrial, commercial, residential); the type of waste (municipal waste, sludge, hazardous, etc), and various institutional and geographic considerations e.g., rural or urban, multiunit residences and single family residences.

The conditions of the service can range quite widely as can the existence and influence of an economic instrument component to the provision of the service. In developed countries e.g., US, residential service rates based on volume (and sometimes weight) have become commonplace.

- Percentage Surcharge on Residential Rents (EID)

A 2% tax of rents is currently assessed on residential rents and ear-marked for street cleaning. The current system is not an economic instrument because it does not create any incentive to reduce the solid waste discharged to the streets. It may, however, be used as collection mechanism for residential solid waste collection and disposal services provided by local authorities. If the fee is designed to vary with the service provided to a decision unit e.g., by volume or by frequency of collection, then this will have been transformed, at least to some degree, into an economic instrument.

- Fixed Surcharge on Residential Electric Bills (EID)

## **Annual Registration Fee on Automobiles**

Such a registration fee already exists in Egypt. It would be modified to reflect the environmental damages that result from use of the vehicle as a function of its age, size of engine, fuel type, and, perhaps, status of pollution control equipment on the vehicle. Environmentally dirty cars, buses and trucks would be subject to higher registration fees based on average performance of similar vehicles. In Sweden this charge is based on vehicle type, weight, fuel, and number of axles. Such differentiated annual registration fees also are used in eighteen other countries of the OECD (Committee on Fiscal Affairs and the Environmental Policy Committee, 1997).

## **Permits for Construction**

### **Various Publishing and Labeling Initiatives**

This has been used to great effect in the US (the Toxic Release Inventory) and Europe (PRTR programs).

The Indonesian program described below has also been the model for the Ecowatch program in the Philippines. Similar programs are being planned in China, Mexico, India, Colombia, Bangladesh, and Thailand.

- Water effluent performance classification for individual facilities in Indonesia

This system (PROPER) classifies the water polluting performance of major industrial sites. Indices are constructed based on self-reported information required of these facilities, voluntary information provided by the firms, and inspections. Participation is not voluntary. Provisions are made in the PROPER process for a facility with a poor classification to clean up before public disclosure and to assure that the rankings are objective. The rankings are reported using a five color code ranging from gold (those facilities with excellent performance as measured by the index) to black (those facilities with very weak performance as measured by the index). The method for computing the index has evolved over time. This program has been going for over five years and is considered to have been very effective in an otherwise weak regulatory environment.

### **Voluntary Participation Audits of Firms for Environmentally Friendly Production Practices.**

The firms participate in this program on a voluntary basis. They are audited to see that extent to which they follow production and housekeeping practices that are environmentally friendly. They are given a color code designation based on this audit and are entitled to represent themselves to the public and potential business partners as an environmentally "gold", "green", or "brown" firm.

### **Product Charges**

As economic instruments, product charges place on goods that are already traded in the marketplace have an administrative advantage in that there is already an existing basis for assessing a product charge. A disadvantage of the product charge is that it is one step removed from the pollution itself. The charge may discourage use of the product e.g., a product charge on a particularly persistent pesticide will discourage use and encourage substitution to other, less persistent pesticides. But the product charge will not encourage use of the product so as to reduce actual emissions or exposure e.g., application practices that reduce worker exposure or contamination of soils and water. As the EI of choice, the product charge works best when there is little opportunity for process control and close substitutes that are more environmentally friendly are available.

### **Fuel Based on Sulfur Content**

Taxes based on the SO<sub>2</sub> content of fuel have been introduced as part of a set of instruments to control sulfur emissions in Norway (SO<sub>2</sub> tax on fuel oil sulfur content) and Sweden (SO<sub>2</sub> tax on coal, peat, gas, and oil). A particular feature of these taxes is that they offer rebates of the tax if measured SO<sub>2</sub> emissions are reduced relative to those anticipated from combustion of the fuel alone. This is an attempt to continue to encourage end-of-pipe controls or process changes for emission reductions when using a product charge.

### **Cyanide - Used Mostly in Metal Plating (EID)**

EID: Product charge on cyanide used in Metal Plating.

## **Product Charges on Tires and Vehicle Batteries**

Such product charges were established in Hungary in the mid-90s for the purpose of raising revenue to support specialized treatment facilities (in the case of tires and vehicle batteries). These charges were collected from domestic manufacturers and as a surcharge on imported products. There was no provision for a refund to users so these were not deposit-refund systems. The revenues accrued to the State Environmental Fund. Some of these revenues were used to support administration of the fund and the product charge. The balances were to be used to subsidize designated collection organizations and processing organizations. It was expected that the designated collection organizations might offer a financial reward (bounty) on used products if this was a cost-effective way to collect the products.

## **Product Charges on Packaging**

In Hungary, the main purpose of this product charge is to encourage recycling. The product charge is differentiated to favor recyclable packaging and revenues collected were earmarked for primarily for subsidies to recyclers of packaging material.

## **Product Charge on Vehicles**

Egypt already has a tax on the sale of new vehicles. Most of the countries of the OECD, in addition to their annual registration fee, have a sales tax that is differentiated based on the environmental characteristics of the vehicle.

## **Permit Trading for Air Emission Reductions**

This type of EI is often identified with more developed countries, particularly the US, and with large scale problems e.g. acid rain. Such permit and trade programs can also, however, work in developing countries. They can also work for local problems or any problem where a permit system is effective and in place already. For example, in the US permit trading has been used to control local pollution from wood burning stoves by requiring any new permittee to retire more than one existing permit.<sup>9</sup>

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<sup>9</sup> This also works well because new wood burning stoves are much more efficient and cleaner burning than the older varieties.

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