

# The market failures of Palestinian natural resources

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## **Key words**

Externalities. Market failure. Palestinian natural resources. Poverty. Short-sightedness.

## **1. Introduction**

One of the reasons why environment is seldom considered in policy appraisal stems from the fact that environmental goods and services are not marketed and therefore do not have prices that can be comparable with development costs and benefits. Economic theory explains the absence of markets for these goods and services with the market and policy failure arguments.

Market failures are defined as those circumstances that prevent the perfect competition, and therefore economic efficiency, from being achieved. The major sources of market failures related to natural resources are summarized below.

- Externalities.
- Public goods.
- Property rights.
- Ignorance and uncertainty.
- Short-sightedness.
- Irreversibility (FAO, 2002).

The objective of this research in addition to understand the market failures reasons is to give some examples of the existence of these reasons in Palestine, and to recommend how to overcome these market failures of the environmental goods and services.

## **2. Externalities**

Externalities are not the producers or the consumers; they are the third parties who affect the environment. The externalities could affect the technology, the consumption or the preferences. Externalities could be negative or positive.

### **2.1 Externalities that have affected the natural resources in Palestine**

The natural resources of Palestine have been subjected for thousands of years to change on a large scale. Deforestation, transhumance, grazing, agriculture, fire, plantation forestry, introduction of exotic species, urban and industrial development, tourism, population growth and movements and land confiscation as political impacts have dramatically altered the face of Palestine. In this place, the biomass is now made up of remnants of natural and semi-natural vegetation in a mosaic of agricultural land, planted forests, wasteland, roads, industrial landscapes and urbanization. Today many plant wild species occur in small, fluctuating and poorly dispersed populations as a result of habitat fragmentation and face extinction or severe genetic loss.

The people that arrive in ancient geographical Palestine were hunters/collectors. Their habits and numbers were such that they interfered little with their host ecosystem. But once they began settling and farming the fertile valleys and hillsides, they encroached

quite radically upon the ecological status quo. Cultivated crops replaced native vegetation, as vines and orchards replaced native forest and shrub land, maintained with terracing and man-made irrigation channels and drainage ditches. All was fine as long as this network of human alteration of the native plant and landscape received the attentive human maintenance it required.

Unfortunately, such continuity was prevented by the succession of wars brought to the area (Byzantines, Mongols, Crusaders, Mamelukes, Turks, Israelis and others) by subsequent waves of conquerors who killed or drove out the farmers. The so –called human improvements and cultivated vegetation were left abandoned and fell into ruin, leaving the soil, now deprived of even its native cover, subject to extensive erosion. This was especially true at the higher elevation where the scantiness of the soil, combined with the erratic rainfall of the region, made it difficult for the original vegetation (mainly forests) to reassert itself.

Successive cycles of trees cutting and neglect characterize the history of Palestine's arable land down through the centuries, as one invader followed another, bringing wars, often in close succession, which violated the countryside and left the landscape drastically and permanently changed. Thus, forests in Palestine were subjected to accelerated changes as the successive occupations did not stop and did not give a chance for their regeneration. Cutting trees for several purposes, mainly for colonies constructions, continued, despite the fact that it is now happening intensively for more than 50 years.

These Israeli military activities are probably the most environmentally damaging. A total of 2,975 hectares of land were shaved by Israeli forces in the Gaza Strip, between September 2000 and March 2001 (Israeli army uses this expression to indicate complete removal of any living thing from the surface of the area). The documented cases of cleared land from trees in the Palestinian territories already reach 271,797 trees, as reported by MOA. If an average tree sequesters about 6 kg of CO<sub>2</sub> a year, then the total additional load of CO<sub>2</sub> will remain in the air, amounting 1.6 million kilogram or 1630 t/year, adding more GHG.

In addition to the successive wars and political constraints, other direct pressures on resources continue, such as the intensive use of wood, rapid population growth, economic growth, forest fires, and development of tourism industry, lack of research, inventory and monitoring of forests, scarce extension and public awareness and lack of Palestinian laws related to forests. An example is the effect of the herdsmen and their flocks where the local black goat, nibbling away at the young shoots and bark of trees, hastened degradation of the forest and its conversion into low scrub. Shepherds also felled trees, which they needed for firewood; to the present day, Bedouin women with large bundles of twigs on their heads bound for their encampments are a familiar sight in many Mediterranean countries.

It is worth mentioning that, at this stage, estimating these negative externalities in monetary terms is not possible due to the insufficient data related to many variables and more particularly, the complete lack of quantitative information. Anyway, overgrazing is one of the major factors damaging the forests that are under the Palestinian control. However, its negative effects in terms of soil erosion, desertification, and species loss could not be estimated, neither in quantitative and monetary terms (Ghattas and et al., 2003).

### **2.1.1 The Palestinian private sector and the economy**

After 1997, there were indicators of an expansion in private investments in the Palestinian economy, such as the increasing number of registered private companies

(whether operational or to be yet), including foreign companies, although many of those are owned by Palestinians carrying foreign nationalities. In the beginning of this century, the Palestinian economy witnessed a decline in investments. It is expected that such decline has reached its peak during the years 2001 and 02 in light of the Israeli policy in response to the second uprising.

In the opening of Al-Aqsa Exhibition of Palestinian Industries in Jeddah, Saudi Arabia, on June 08, 2002, the Palestinian Minister of Industry stated that Israel has destroyed 386 factories representing the different industrial sectors in Palestine. In result, Palestinian Authority revenues decreased from \$120 millions per month to less than \$18 millions (PPPA, 2002)

### **2.1.2 The impact of the current crisis on the economic condition of the Palestinian households**

The results showed an increase in poverty rates during the current crisis compared with the situation on the eve of the Al-Aqsa Intifada. The results indicated that the poverty rates reached to 29.5 % in 2005 compared with 20.3 % in 1998, with an increase of 9.2 percent (PCBS, 2006).

## **3. Public goods**

Most of the environmental resources could be classified as public goods. Public goods are non-excluded goods where no one can exclude the consumer of using them. Also public goods are non-rival goods where there is no competitiveness for using them. These non-excludability and non-rival characteristics mean that each individual can use public goods simultaneously and in equal amount.

In Palestine, however, systems of forest ownership and management are diverse. The reserve system is applicable where the state is the major forest owner and private forest ownership is limited. This regime was mainly created and implemented during the colonial period of the British mandate. According to 1999 data of property and type of forests in Palestine, it can be noted that most of the forest area (91%) is under state ownership, while the rest (9%) is in private hands (ARIJ, 1999).

## **4. Property rights and environmental laws**

Property rights and environmental laws are how the individual has the right of using the natural resources by law, and does he has the ownership right, lease, or use rights conferred by law. OECD reported that perception of the environmental risk is linked with the need of property rights. As there are high degrees of risks of degradation for environmental resources, there will be more need to manage them collectively and to create rules toward the resources.

According to one study conducted for management conservation of medicinal plants production in Palestine the land tenure system is inherited from the Ottoman period. Land ownership forms are private individual (*mafruz*), private communal (*masha*) or state-owned (*miri*). Regarding medicinal plants collection, there are no significant law enforcement mechanisms that would prevent collectors from gathering plants from any land that lies uncultivated or unfenced. This is true of all land ownership forms (ALSAHEL, 2006).

The availability of good quality land tenure data is necessary to enable informed debate and the generation of appropriate land tenure and rural development policies. This need, coupled with increasing pressures on land resources, has led the Land Tenure Service of the Food and Agriculture Organization of the United Nations to focus on land tenure data as one of its major areas of activity under its present work program. Its objective is to support the Member Nations of the Organization in their analysis and understanding of the role of land tenure in rural development and, more specifically, of how good land tenure data are used to support improved policy- and decision-making. Given that relatively few national agricultural censuses and other appropriate data collection activities record much data on land tenure, this activity, in cooperation with FAO's Statistics Division, supports Member Nations that are considering inclusion of such data by helping to identify what data might be useful and why. These data are crucial for improved decision- and policy-making in the fields of economic development, food security and environmental sustainability (FAO, 2006).

The Palestinian Environment Law No. 7 (1999) identified among its main objectives the necessity to “introduce foundations of environmental protection in the social and economic development plans and promote sustainable development of biological sources with consideration for the rights of future generations” (Article 2 paragraph 3) and “conservation of biodiversity, protection of sensitive environment and improvement of environmentally affected areas” (Article 3 paragraph 4). These two objectives, according to the Law, are to achieve the “protection of public health and social welfare” (Article 3 paragraph 2).

The Environment Law seeks to guarantee: a) protection of the natural wealth and resources and protection and maintenance of life species and basic environmental systems (Article 5); b) optimal use and protection of natural resources and special natural zones (Article 6); c) the establishment of criteria for the conservation and monitoring of natural reserves (Article 40); d) preventing harm to natural reserves or forested areas (Article 44). The Environmental Law entrusted the Palestinian Environment Quality Authority to coordinate with the concerned parties to identify the required conditions for the conservation of biodiversity in Palestine (Article 42); to establish criteria to guarantee the survival and continuity of wild and forest plants and trees (Article 43); and to identify and regulate activities requiring prior approval (permits) in order to protect the environment (Article 47) (ALSAHEL, 2006).

## **5. Ignorance and uncertainty**

Ignorance and uncertainty are the absence of the information and knowledge for the nature of the environmental resources that will impact negatively on their quantities and qualities.

A study for pesticide practice in Gaza, discloses many of problems. Almost nothing is done to instruct farmers or to law their use of the toxic chemicals. Scared of crop failures, farmers often apply pesticides unnecessarily to insure a return. Pesticides are seen as a magic potion, without thought for health or the environment. Slight information exists on the proper storage, application and throwing away of pesticides and their containers. A small number of farmers put on protective masks, clothing or gloves. Empty containers are often reused, even for household storage, or are burned, releasing dangerous toxins into the air. Where proper equipment is lacking, farmers apply pesticides with bare hands or makeshift devices, often guessing at application rates. Some apply pesticides through irrigation systems as they do fertilizers, resulting

in pesticide backflow into the groundwater. Many instances were found of farmers using the wrong pesticides in the wrong quantities at the wrong times, or of farmers experimenting arbitrarily with mixing chemicals or adding antibiotics or hormones. Often little heed is given to the required lull between the application of pesticides and harvesting. Pesticides such as DDT, Diazinon and Lannate are used to retard spoilage in stored potatoes, mangoes, etc. Lannate is also used by fishermen to increase their take and to preserve stored shrimp. When pesticides lose their effectiveness, farmers tend to compensate by spraying more, spending more money and further compounding the environmental detriment (HOSH and et al., 1992).

Medicinal plants in Palestine are collected from the wild by collectors through tribal, forest residents and other local people. The collected material is passed on the traders in town and cities of Palestine. Generally, as the price paid to the gatherers is very low, the gatherers often mine the plants excessively to generate more income. Most of the time, need to earn more, coupled with the ignorance of the collectors about plant biology and selective harvesting leads to whole plant being destroyed.

In reality, resources managers in Palestine are always confronted with the lack of adequate information about the plants use, their distribution, the genetic diversity of the wild populations and relatives and above all, the annual sustained yield that can be harvested without damaging the populations (ARIJ, 2006).

## **6. Short-sightedness**

Short-sightedness when people just think of benefiting from the environment on short run periods and they forget the benefits they may win in long runs.

In Palestine the collected medicinal plants are mostly finish with the traders, who with their inadequate knowledge arrange out the marketable ingredients in an unrefined manner, resulting in contamination with other materials leading to poor quality. Many of the medicinal plants are vulnerable to climatic conditions, requiring appropriate drying and storage under specific temperatures and humidity. This viewpoint is largely neglected by the collectors and traders leading to deterioration and rejection of the produce for the export trade.

A study for the Palestinian Hydrology Group in 2005 about springs and dug wells of Hebron district revealed that the spring and dug wells of Hebron are, in general in danger of pollution by the surrounding human activities such as the presence of cesspits or extensive uses of fertilizers, or as a result of near by existence of manure. The water of these wells is used for drinking, animal breeding and plat irrigation (Awadallah and Owaiwi, 2005).

In Palestine according to the Central Bureau of Statistics education of head of household is negatively associated with incidence of poverty. The poverty rate for those obtained less than elementary education (41.4%) was almost two and half times higher than those with a two-year college degree (16.9%), and almost four times higher than those with a university degree and above (9.6%). Poverty decreases consistently with educational level when other measures of poverty are used for 2005.

## **7. Irreversibility**

Irreversibility: Since the preferences of the coming generations are not known and some development investments may determine the irreversible loss of natural resources both for the present and future generations. This will make less opportunity

available for the coming generations to benefit from the used asset. It will be difficult to tell if it is worth demolishing forever a resource or keep it, as the preferences of the coming people are not known.

In Palestine in the lack of any regulatory procedure, the trade of medicinal plants is very cautious. Stakeholders like collectors, traders, wholesale dealers and companies involved the collection and processing of medicinal plant do not understand nor have confidence in each other. Similarly in the deficiency of proper management system, the collectors and the contractor who extract medicinal plant products from the wild do not have any responsibility of replenishing the natural resources through re-planting.

The pollution of soil with different types of contaminants has a severe impact on soil quality. One conclusion drawn from this is that there maybe a correlation between soil contamination and cancer, since according to World Health Organization reports, the West Bank and Gaza Strip has one of the highest percentages of people suffering from cancer in the world. The Hebron District has a particularly high rate of people suffering from cancer, and this will cause health problems for the next generations.

There are several causes for soil contamination in the West Bank. Pesticides and insecticides are the main soil contaminant in irrigated areas. 200,500 dunums of irrigated land in the West Bank (3.6% of the land area) are intensively exposed to these chemicals. It is estimated that the total quantity of pesticides used in Palestine in the 1995/96 growing season was 454 tons. This included pesticides that are internationally banned, and by time soil will not be suitable for planting.

The excessive and uncontrolled use of fertilizers is another source of both soil and groundwater contamination. It is estimated that the total quantity of fertilizers used in the 1995/96 growing season was 49,420 tons, and that will affect negatively both on soil and water.

Chaotic disposal of industrial and municipal waste is another source of soil contamination in the West Bank. Sewage streams can be seen around major cities and towns leading to severe soil contamination. There are about 450 dumping sites in the West Bank. Most of the dumping sites are located in the wrong place, either adjacent to agricultural land or urbanized areas. There are several hot spots where the negative effects of industrial waste disposal are concentrated. For example, many industries located inside Hebron City dispose their waste on to the surrounding agricultural land. These industries include leather tanning, shoe making, ceramics and glass, electroplating and metal work, and are the main source of heavy metal accumulation in surrounding soils. The income generated by this industry may increase but the costs which will be paid by the society for removing or for health curing may exceed this income generation.

Limestone waste (sludge) emanating from stone cutting factories mainly in Hebron District is another source of soil contamination. Approximately 7500 tons of building stone slag is produced annually in the West Bank, causing a significant waste disposal problem, and that may explain the increasing number of the cancer cases reported in the area during the last years.

The accumulation of heavy particles from limestone slurry and dust is thought to change the soil chemistry and the physical structure of the agricultural land adjacent to the quarry. The dust increases the calcium carbonate percentage, leading to more alkaline soils in a region that is already characterized by alkaline soils. These particles may also change the texture of the topsoil depending on the particle size of the settled dust. It is also thought that the wastewater generated by quarrying, with the help of

rain, drains into and pollutes the surrounding soils, and that surely affect the chances of next generation of using these soils for suitable planting (ALSAHEL, 2006).

### **8. The poor in Palestine have become poorer and increase in numbers**

This was evident in the reduced ability to access health and education services, the rapidly increasing poverty rates and the poor ability of formal and informal institutions and charitable societies, to alleviate poverty. The limited potentials and structure of local governance bodies have become evident, while most of them rely largely on external funding. The decline in living standards was apparent in the inability of increasing numbers of citizens to pay their due bills of water, electricity and regular taxes. The siege and restrictions on mobility and the few numbers of judges have caused lawsuits to accumulate in courts. Fragmenting the market to small units has weakened the private sector and affected its confidence in financial transactions and willingness for investment. The situation also has further aggravated other features, such as child labor and malnutrition among children.

The widespread nature of poverty and the overlap of its causes between Districts, localities and social groups should not prevent us from noticing the existing variations and their implications for developing policies specific by sector, District and social group (PPPA, 2002).

According to the Palestinian Central Bureau of Statistics the consumption data indicates that the rate of the total diffusion of poverty among Palestinian Households in the Palestinian Territory is 29.5% in 2005, (of which 22.3% in the West Bank and 43.7% in Gaza Strip), while 51.5% of households were found to obtain an income less than the national poverty line in 2005 (of which 45.7% in the West Bank and 63.1 percent in Gaza Strip).

Also, the consumption data indicates that 18.1% of the households in the Palestinian Territory were suffering from deep poverty in 2005, (of which 13.1% in the West Bank and 27.9% in Gaza Strip), and it increases to 40.2% if the income data is used.

Refugee camps have the highest incidence of poverty overall. The consumption data shows that poverty in refugee camps were 39.9%, and this is higher than the rate of poverty in urban (24.9%) and rural areas (32.5%). A greater proportion of the poor is in urban areas (46.5%) and rural areas (32.1%) than in refugee camps (21.4%). The picture remains essentially the same when income data is used.

The poverty rate for the 1st quarter of 2006 was estimated using the available data of the household expenditure and consumption for the period January-March 2006. The poverty rate stood at 29.4% of households, and increases to 47.5% if income data is used, during the 1st quarter of 2006.

The poverty rate is estimated to stand at 45.2% of households (about 51.0% of population), and increase to 66.8% of households if income data is used (about 70.3% of population) during the 2nd quarter of 2006 (PCBS, 2006).

### **9. How to overcome market failures:**

According to one of FAO studies in 2002 these market failures can be overcome either through direct negotiation between the parties involved or through intervention of the government at both the local and central level. In both circumstances, the estimation of the economic value of natural resources and environmental impacts of investment projects can facilitate the task.

### **9.1 Negotiation among affected parties**

FAO viewed that negotiation among the affected parties usually happens when there is a small number of parties involved and the cost of transactions is low. Transaction costs are the costs incurred to reach an agreement. If these costs are higher than the expected benefits of the agreement, the deal will fail.

Possible transaction costs are the time necessary to get the parties together, the absence of clear information on benefits obtainable and costs incurred, the difficulty of enforcing the agreement, and the difficulty of establishing how to implement the agreement are examples of possible conflict resolution through negotiation.

### **9.2 Government intervention**

According to FAO government intervention at the central or local level generally takes the form of economic incentives and command and control measures aimed at modifying the behavior of agents towards the use of the environmental goods and services. A multitude of economic incentives are ownership rights, taxes, tariffs, charges, fees, royalties, subsidies, tradable permits, green funds, deposit refund systems, and environmental bonds; among command and control measures are norms, standards, and regulations.

## **10. Summery**

In Palestine as other countries in the world environment is not considered in policy appraisal stems from the fact that environmental goods and services are not marketed and therefore do not have prices that can be comparable with development costs and benefits.

The dominant economic theory maintains that free and perfectly competitive markets will lead to optimal allocation of resources, including environmental goods and services, or to economic efficiency.

Market failures are defined as those circumstances that prevent the perfect competition, and therefore economic efficiency, from being achieved.

This paper discusses the major sources of market failures related to natural resources, which are the externalities; the public goods; the property rights; the ignorance and uncertainty; the short-sightedness; and the irreversibility, and tries to give some examples of the existence of these reasons in Palestine, and how to overcome them.



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