



Palestinian National Authority

Environment Quality Authority

Environment Sector Strategy

Executive Summary

March 2010

Preface:

The Environment Quality Authority (EQA) seeks to promote sustainable environmental development of the Palestinian society. Its core mission is to protect the environment with all its elements and prevent environmental hazards threatening all living things. To achieve these goals, this Environment Sector Strategy document was developed as part of the ongoing environmental planning conducted by EQA. The Strategy aims to present and analyze the current environmental status and identify major environmental problems and their causes in order to determine priority actions leading to the achievement of the desired objectives from the implementation of the adopted policies.

EQA is the umbrella for all activities and studies related to environment planning, protection, monitoring and control. However, this is not solely the responsibility of EQA but rather it should be shared by all other Palestinian ministries and institutions concerned with the Palestinian environment based on the principle of partnership and complementary work.

I would like here to extend gratitude to deputy chairman of EQA, the leader of the national team and coordinator of task forces, as well as to all EQA staff who contributed to the development of this strategy and made it possible. Particular thanks are due to the technical teams, the internal supervision team, as well as the daily working team. I also would like to thank all stakeholders involved in this work, including official institutions, civil society organizations, universities, private sector institutions and concerned individuals.

Finally, I would like to extend appreciation to all parties that offered financial or technical support in the development of this Strategy, particularly the United Nations Development Program (UNDP) and the Ministry of Planning and Administrative Development (MOPAD).

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1. Introduction and Methodology

1.1. Introduction

During the long years of Israeli occupation, the Palestinian environment has suffered from negligence and inappropriate management leading to a deterioration in the different environmental elements, including water, soil, air and biodiversity. In addition, the steady population growth and its implications on the process of economic and social development is creating a growing demand on natural resources and increasing the amount of waste and pollutants resulting from the consumption increasing. This is aggravated by restrictions and obstacles imposed by the Israeli occupation on the development process in general and on environment protection and rehabilitation in particular, including Israeli violations against the Palestinian environment. All of the above have contributed to the increasing the deterioration of the environment and have prompted the Palestinian National Authority (PNA) to put the Palestinian environment high on its priority list.

Based on this, EQA was established as the official Palestinian body with the mandate to monitor and implement all what is necessary for the protection of the Palestinian environment and the provision of clean and healthy environment to ensure the right of all Palestinians to the highest attainable level of health and welfare as guaranteed in the Palestinian basic law and environmental law. Accordingly, EQA mission statement is articulated as follows: **"Maintaining and protecting the environment, preserving human health, curbing and reducing the depletion of natural resources, combating desertification, preventing the aggravation of environment pollution, promoting the environmental awareness and ensuring achievement of sustainable environmental development."**

In order to achieve this mission, the first Palestinian attempt to carry out strategic planning in the environmental sector was done in 1999, when the Palestinian Environment Strategy was developed as a basis for environmental action at that time over a ten-year period. That strategy identified environmental issues, strategic objectives and priorities at the national level. In addition, the strategy included a work plan that translated the needs and gaps to projects and interventions, as well as monitoring indicators to measure the progress. However, that strategy did not have much chances to turn into reality, as the second intifada erupted just after it was produced and adopted, causing a shift in the way of dealing with environmental issues and development issues in general. At that point of time, national support and attention was shifted towards relief work at the expense of development in order to ensure urgent response to the siege, destruction, curfews, incursions, and other measures of the Israeli occupation. Medium or long-term planning became impractical and inappropriate to the situation prevailing at that time.

Later on, the situation of environmental planning, like in other sectors, ranged between attempts to update the action plan on the one hand and try to fundraise for emergency projects on the other hand. Systematic work on planning was resumed by recent Palestinian governments with the launch of the Palestinian Reform and Development Plan (PRDP). The current government took the initiative to conduct a comprehensive planning exercise in the form of 18 sectoral strategies and five cross-sectoral strategies as an essential entry point towards the development of the overall national plan for 2011-2013, which will pursue goals and priorities to ensure the elimination of obstacles and effects of

the Israeli occupation and establish an independent Palestinian state. A decision by the Council of Ministers in this regard was issued in August 2008.

In this context, MOPAD issued a manual for the preparation of sectoral and cross-sectoral strategies in order to standardize the strategy development methodology and provide a tool to assist ministries and government institutions in the development of sectoral strategies. This was envisaged to ensure that the strategies will meet the development challenges, be more realistic and take into account the need for coordination, integration and harmony among the related strategies. The manual identified a set of equally important principles that cover the process and desired outputs and allow for the participation of all segments of the Palestinian society in the preparation of strategies. These principles included consensus, long-term vision, national leadership and ownership, high-level government commitment, inclusiveness and integration, the impact of the occupation on the development and implementation of sectoral strategies, clear budget priorities, reliance on internal comprehensive analysis, building on existing strategies and processes, and active participation in the preparation and implementation of strategies. The technical annex of the manual, published in October 2009, included technical guidelines for the preparation of different components of the sectoral strategies and requirements that must be met by the technical strategies, in addition to mandatory forms to be adopted by the strategy and steps, mechanisms, roles and responsibilities of various institutions.

1.2. Methodology

Like other Palestinian institutions and ministries, EQA responded to the directions of the Council of Ministers and MOPAD and started the development of the environmental sector strategy . An internal task force was formed in order to follow up the internal strategy development process and ensure that the strategy reflects EQA environmental perspective and values. Next, a national team was formed to work on the strategy development, with the involvement of major stakeholders. The main duties of the national team were to provide leadership and direction for strategy development, approve and endorse the adopted mechanisms and work plan, as well as review and endorse all the resulting documents and outputs.

EQA paid special attention to involve all relevant stakeholders, including official institutions, the private sector, civil society organizations, and relevant international organizations. Such wide participation was motivated by a belief that this strategy is a national one concerning all actors; their involvement in its development will provide a guarantee that it will be implemented by all and will guide their action.

2. Vision of the environment sector

Considering all relevant institutions and stakeholders of the environmental sector and the various problems and challenges facing them, the vision of the environmental sector was conceived as follows:

“A protected, maintained and safe Palestinian environment, that achieves sustainability of natural resources, meeting the current needs of the Palestinian

society, while ensuring the rights of future generations to enjoy a healthy and safe environment and social welfare under an independent Palestinian sovereignty.”

To realize this vision, the following requirements need to be achieved:

- Palestine is an independent state with full sovereignty and an active party in all international and regional environmental treaties.
- Principles of environment protection are included in national, regional and local development plans and strategies, ensuring that environment is a priority at all levels.
- The Palestinian environment institution is strong, able to implement its plans and directions aiming at the protection of the Palestinian environment, supported by a real partnership with other government institutions at the national and local levels and with the NGO and private sectors, and assisted by relevant executive state institutions in the implementation and enforcement of environmental legislations.
- All segments of the Palestinian society have a high level of environmental awareness and education which enable it to actively participate and intervene in the preservation and sustainable use of their environmental and natural resources.

3. Situation analysis

Analysis of the situation in the environmental sector is the starting point for any planning process, providing the basis on which the development of environmental policies, objectives and strategies is built. Situation analysis is a way to describe the situation of the sector and define the involved problems and gaps, which would allow setting priorities and identifying solutions and interventions to be addressed in the action plan to overcome the problems and bridge the gaps. The following is a brief description of environmental themes addressed by the strategy:

3.1. Water sources

Groundwater is currently the main source of water in Palestine, with an estimated annual renewable capacity of about 669 million cubic meters (MCM) in the West Bank, in addition to wadis and runoff water with an estimated annual volume of 215 MCM. In Gaza Strip, the main source of water is the Gaza coastal aquifer, with an estimated annual renewable capacity of 45 MCM. In addition, the Jordan River has an estimated annual discharge of 1320 MCM, but the Palestinians cannot use it at all because of complete Israeli control over it, although the Palestinians have rights in this river reaching up to 250 MCM per year (PWA, 2010).

The most significant problem facing this sector is the Israeli occupation's control over more than 90% of Palestinian resources. This is creating a steady increase in demand for water leading to over-pumping of groundwater from wells, particularly in Gaza Strip, which deteriorates the quality of these resources. On the other hand, wastewater, leachate from solid waste, and agricultural activities are negatively impacting groundwater, especially in Gaza Strip. In addition, non-conventional water sources, such as treated wastewater, are not being properly utilized. It is worth mentioning that the expected negative impacts of climate change on the quantities and distribution of rainfall may exacerbate the problem of water shortage and may affect aquifer recharge.

3.2. Waste

3.2.1. Solid waste

The solid waste sector includes all processes starting from the collection of solid waste, going through transport, transfer and treatment and ending with final disposal in sanitary landfills, such as Zahrat Al-Finjan landfill near Jenin and Deir Al-Balah landfill in Gaza Strip, or in open or random dump sites.

The amount of household waste produced in the Palestinian territory in 2008 was estimated at about 2861 tons per day. The average production of solid waste by a Palestinian household was estimated at 4.6 kg per day, or an average of approximately 0.7 kg per capita (Palestinian Central Bureau of Statistics – PCBS, 2008).

The final disposal of solid waste can be done in safe ways (sanitary landfilling) in landfills that meet the environmental requirements and standards, such as Zahrat Al-Finjan landfill, Deir Al-Balah landfill and Jericho landfill. The amount of waste that is being dumped in such landfills is estimated to be 630 tons per day, which is equivalent to 22% of the amount of waste produced daily in the Palestinian territory. Additional 42% of waste is disposed in controlled landfills, such as Juhur Al-Dik landfill, Rafah landfill and Al-Bireh landfill (NSWMS, PNA, 2010). The remaining quantities (36%) are disposed in random dumpsites and uncontrolled landfills that do not meet any of the environmental and sanitary requirements and standards. In fact, there is a large number of such random dump sites, estimated at 147 sites spreading throughout the Palestinian territory and creating a source of pollution (NSWMS, PNA, 2010).

With regard to waste treatment, there is no real treatment so far in any of the existing sanitary or unsanitary landfills, except for some initiatives, like those in Zahrat Al-Finjan landfill and Deir Al-Balah landfill.

On the other hand, it is worth mentioning that the legal and legislative system regulating the work in this field is marred by some inconsistencies, contradictions and duplication, as well as a lack of inclusiveness and harmony. Roles and responsibilities vary from one law to another; interpretation of law provisions also vary between the different stakeholders, causing a gap between their legal provisions and their actual implementation on the ground. The lack of a specific law or an endorsed legislation for solid waste management leaves room for discretion in the interpretation of these laws and, consequently, creates duplication and conflict of roles and responsibilities.

Assigning clear and specific tasks and responsibilities based on a clear delegation of roles as prescribed by law, addressing certain problems of conflict and duplication with respect to solid waste management activities, and setting institutional arrangements that cover all levels, and ensure regulated interaction between the competent institutions to facilitate cooperation and flow of reliable information, all represent top priority issues and a key prerequisite for achieving effective management of this field (NSWMS, PNA, 2010).

3.2.2. Liquid waste (wastewater)

The wastewater sector suffers from a severe shortage of infrastructure. The percentage of households connected to sewage networks is estimated at 52.1% (PCBS, 2009) at the national level with significant differences between the West Bank and Gaza Strip. The remaining proportion often rely on septic tanks or cesspits as the only means for wastewater disposal. The percentage of households connected to a sanitation network rises to 83.8% in Gaza and sharply drops to only 35.5% in West Bank governorates because of the rural nature of these areas. The percentage of connection to a network appears very low if compared to the number of localities: in the West Bank governorates, only 64 localities are connected to a network out of 569, while in Gaza governorates, 21 localities out of 30 are connected to a network (PCBS, 2008).

The quantity of wastewater discharged into the environment is estimated at about 106 MCM per year, in addition to amounts discharged by Israeli settlements in the West Bank, which are estimated at about 39 MCM per year. Wastewater treatment plants are in need for upgrading and maintenance, since most of these plants are obsolete (the majority were established in the 1970s) and the influent quantities of wastewater exceed their capacity, which reduces the efficiency of treatment to a large extent. In addition, these treatment plants cover limited areas only in the Palestinian territory.

As for industrial wastewater, most factories (59.9%) dispose of their waste water in the sewage networks, putting these networks under a risk of damage by chemicals found in industrial effluents. In addition, 29.9% of factories dispose of their waste water in cesspits, putting groundwater under the risk of pollution (PCBS, 2009). On the other hand, hazardous wastewater discharged from health institutions is not treated separately and is discharged into domestic wastewater networks.

3.2.3. Hazardous waste

Many types of waste can be classified as hazardous, such as electronic waste, hazardous agricultural waste, medical waste (including waste from laboratories), bodies of animals infected with infectious diseases for animals or humans, and any other materials or tools contaminated with infectious diseases because of these wastes, such as animal waste, hazardous industrial waste, used batteries, asbestos waste, and others. The absence of precise technical specifications or classification of hazardous waste or a list of its sources and the lack of information on this type of waste make it more difficult to determine its size and consequently identify appropriate ways for its management and disposal (National Strategy for Solid Waste Management, 2010). The Palestinian territory in general lack special dump sites designated for the disposal of hazardous waste, except for a hazardous waste unit attached to Gaza municipal landfill (UNEP, 2003). It should be stated that a pilot project is being implemented in Ramallah in the West Bank, particularly in Ramallah government hospital, aiming at building a medical waste treatment unit within the hospital. This issue requires close attention and follow-up because of its significant impact on the environment.

3.3. Handling of chemicals and hazardous materials

Chemicals are used in the Palestinian territory in various fields. In the field of agriculture, they are used in the manufacturing of pesticides and chemical fertilizers. In the field of industry, they are used in chemical, electronic, metal, mining, pharmaceutical and food industries, as well as in the production of furniture, glass, leather, shoes, plastic and textile. Moreover, these materials are used in medical and agricultural laboratories and scientific research. There is no accurate inventory of the quality and quantity of chemicals and hazardous materials imported legally to Palestine or those entering illegally. The responsibility of managing the import and handling of these materials overlap between several governmental departments, making it difficult to control and track them. There is also no system to retrieve the expired chemicals, or those that are banned globally or locally.

The most serious source of pollution of the Palestinian environment is the Israeli chemicals and hazardous materials and industries which were transferred to the Palestinian territory without Palestinian consent. Most of these industries are highly polluting to the environment and public health, such as the manufacturing of aluminum, cement, canned food, fiberglass, rubber, alcohol, ceramics, marble, cleaning chemicals, paints, metal formation and painting, batteries, pesticides and chemical fertilizers, gas industry, plastics, leather tanning, textile dyeing, the secret military industries, and others.

3.4. Biodiversity and natural environment

Despite its small area, Palestine's nature enjoys a rich biodiversity and large biological variation due to the location of Palestine as a significant point of convergence between the three continents: Europe, Asia and Africa.

Around 47,000 species of living organisms have been identified and described in historic Palestine, in addition to about 4,000 species believed to exist but have not been described yet. Studies indicate that there are approximately 30,000 species of invertebrates and 2,750 species of wild plants within 138 families. In the West Bank and Gaza Strip, there are about 2,076 plant species and 30,904 animal species, including 30,000 species of invertebrates, 427 species of birds, 297 species of fish, 92 species of mammals, 81 species of reptiles, and 7 species of amphibians (ARIJ, 2007). It is noteworthy that many of these species are threatened with extinction and need protection.

With regard to natural reserves, the Israeli occupation has declared 48 natural reserves in the West Bank with a total area of more than 330,000 dunums, i.e., approximately 6% of the total area of the West Bank. They are located mainly in the eastern slopes and Jordan River area. The Palestinians do not have the ability to use or access them, which demonstrates that the Israelis policy of nature protection has political aims rather than those of protecting biodiversity. A portion of these reserves have been converted to Israeli settlements and military bases and a large part was included within the Wall of Annexation and Expansion. There are also about 93 forests in the West Bank and 13 in Gaza Strip, covering an area of 232 km² (ARIJ, 2007).

3.5. Land sources

In this document, land sources refer to land uses, landscape, desertification and soil erosion, in addition to the cultural heritage.

3.5.1. Land use planning

The issue of land use planning is an important and fundamental issue required for the regulation of land uses and determining types and areas of each use. This would facilitate subsequent planning processes involving all sectors, whether urban, agricultural, industrial, environmental, tourism or others. The lack of systematic planning and the improper use of lands due to topography and climate, as well as because of political conflicts and the long period of occupation have caused these and other elements to interact in ways that exert considerable negative pressure on the Palestinian environment and sustainable development.

This issue has received the due attention from relevant institutions since the establishment of PNA and up till now. There have been many attempts to develop and adopt a master plan for land use, but this has not been done fully and systematically. The lack of a clear and endorsed plan for land use has led in turn to overlapping and conflicting land uses and allowed the creation of facts on the ground that may become a barrier to future efforts to regulate this situation.

3.5.2. Desertification and soil pollution

Desertification and soil erosion: The eastern slopes and areas with rainfall lower than 300 mm per year, which constitute about 50% of the West Bank, are among areas most vulnerable to the desertification because of climate conditions and climate change and/or human factors, such as overgrazing and agricultural expansion into marginal lands, which are considered natural pastures. These factors have led to the deterioration of vegetation, loss of biodiversity and degradation of the ecosystem, in addition to the decline in soil's physical and biological properties and soil erosion. Climatic conditions and human activities also play an important role in the process of soil erosion; changes both in the quantity and intensity of rainfall, the decline in soil's physical and biological properties and the deficit of the vegetation cover make the soil more prone to erosion by water and/or wind.

Soil pollution: Primarily pollution results from the discharge of wastewater into wadis and agricultural lands, in addition to the excessive use of pesticides and chemical fertilizers, especially in areas with rainfall lower than 200 mm per year, leading to soil salinity. In addition, the remains of stone quarries and stone and marble industry in the form of dust or slurry lead to the clogging of soil pores and destruction of vegetation. Such pollution involves various risks, most importantly the pollution of water sources.

3.5.3. Landscape

The West Bank enjoys a mountainous natural view interspersed with agricultural plains and urban areas. The climate is classified as arid or semi-arid. Therefore, the forest areas and vegetation cover give this landscape special features, which also include topography, soil, rock formations and natural elements. Age-old olive trees add a special character to West Bank landscape. In Gaza Strip, the landscape is characterized by the sea coast, which extends to about 42 km (EQA, 2001). These elements, combined in terms of shape and composition, have given the landscape of Palestine a genuine character that deserves to be protected.

3.5.4. Natural and cultural heritage

Palestine has a rich history of culture and civilization as evidenced by the multitude of archeological and historical sites. So many civilizations existed on the land of Palestine with remarkable geographical distribution. Such cultural heritage is very important at the national, regional and international levels. If well protected and maintained, such richness entails high economic potentials in terms of tourism, but this potential has not been tapped yet because of lack of awareness and shortage in the required human and financial resources. Although a number of archaeological sites and historic buildings have been destroyed over the years, an adequate number of such unique sites and buildings remains and deserves to be preserved for future generations.

3.6. *Climate change*

Climate change is one of major crises facing humanity, involving serious and long-term challenges that will affect the different regions of the globe. It is noteworthy that EQA, in cooperation and coordination with relevant stakeholders and with support from UNDP, has developed in 2009 two important documents on climate change and associated challenges at the Palestinian level: *Analysis of the Status of Climate Change in the Occupied Palestinian Territory* and *Climate Change Adaptation Strategy in the Occupied Palestinian Territory*. These two documents concluded that Palestine will be vulnerable to the implications and outcomes of climate change in various ways:

- A rainfall decline and temperature increase are expected, which would aggravate the problem of draught and water scarcity in Palestine. The temperature increase is estimated to range between 2.2-5.1°C and the annual rainfall decline is estimated to be at 10% by 2020 and at 20% by 2050 (UNDP, 2009).
- The climate change is expected to aggravate the problem of land degradation and desertification, which will compromise the agricultural production and endanger food security. This may have socio-economic implications in terms of increased poverty and social instability.
- Other possibilities include an increased frequency of natural disasters resulting from draught or extreme climatic events, such as storms, floods, and heat waves.

3.7. Air pollution

Air pollution is a problem in Palestine, especially in urban centers, which is directly related to population growth, increase of industrial activities and cross-border pollutants. Main sources of air pollution include the transport sector, the industrial sector, dust and particles resulting from stone quarries spread all over the West Bank, coal industry, and improper management of solid waste, and the radioactive pollution, both ionizing and non-ionizing. This is in addition to the Israeli industrial zones and factories located in the Israeli settlements in the West Bank. On the other hand, the area is affected by cross-border pollution from Israel, which has a clear and noticeable impact due to factors like the location, wind direction and topographic characteristics. The surveillance and monitoring system in this field is very weak.

Noise: The main sources of this type of pollution are construction, transport and industry sectors, in addition to Israeli military operations. No comprehensive studies have been done to describe the features of this type of pollution, but a Palestinian standard have been developed with this regard.

3.8. Marine environment and coast

Gaza coast and marine environment suffers from many environmental problems, notably the problem of pollution. The main source of this pollution is the discharge of untreated wastewater and dumping of waste along the beach in north, central and southern Gaza. This pollution has resulted in major health problems for recreators and marine life, as well as the degradation of the quality of fish. Furthermore, sand mining and theft is becoming a serious problem, with the estimated amount of sand mined during the past 20 years reaching more than 25 MCM from an area of only 520 hectares (EQA, 2001). Erosion is another problem primarily resulting from the construction of numerous facilities, such as ports, docks, wavesbreaks, roads, etc. These facilities, especially fishing ports and the Gaza port, have caused sand erosion and imbalance in the natural sedimentation processes.

A major problems affecting coastal areas in the present is the problem of climate change, which increases the risk of several environmental problems, most importantly sea-level rise. It is expected that the Mediterranean Sea level will rise by around 35 cm by 2100 (UNDP, 2009).

Dead sea: Since 1930, Dead Sea level has been dropping gradually, reaching its peak in the past 20 years with the average drop ranging between 80-100 cm per year (World Bank, 2007). This drop is attributed to several factors, including a project implemented by the Israeli government in 1964, transferring a large amount of Jordan River water to areas in Negev desert. This is in addition to the high evaporation rate, reaching 1200 mm per year, and the pumping of an average of 200 million cubic meters per year from the sea into evaporation ponds in order to be used for salt extraction.

It is worth to mention here the proposed Red Sea – Dead Sea water carrierproject , which would bring water from the Red Sea in the south to the Dead Sea in the north. Currently, the project is undergoing an environmental, social and economical impact assessment to make a decision with regard to its effectiveness.

3.9. Environment and development in other sectors

There is close link between the environmental sector and sustainable development of other sectors, including the economical, social and political sectors. The environmental sector engages with all other sectors to create a tool for sustainable development, preserving the natural resources and ensuring continued development in other sectors, supporting the sustainability of human resource development.

3.9.1. Energy sector

The level of energy consumption in the Palestinian territory is closely linked to population growth rates and level of economic development. Similar to other developing countries, Palestine largely depends on electricity and all forms of fossil fuel for household, industrial and transport uses, in addition to the use of coal and solar energy (ARIJ, 2007). Energy production, particularly when it is based on fossil fuel, is considered a main source of environmental pollution. Palestine depends on purchasing electricity from Israel and produces only 9.7% of its overall electricity consumption. Increasing this percentage of production will mean a larger and more evident impact on the environment.

On the other hand, production of renewable energy is still in its first steps and has not achieved significant figures yet. Nevertheless, renewable energy accounts for 18% of overall energy consumption in Palestine. Being environment-friendly, such type of energy should be further supported and developed.

3.9.2. Industrial sector

Industry is a main pillar of the economy and the establishment of a future Palestinian state. However, this sector is relatively small in Palestine when compared with neighboring countries. There are several types of industries in Palestine, most of which are traditional and light industries, including chemical and pharmaceutical industries, leather tanning, textile and clothes, stone and coal industry, electroplating of metals, and food industry (Ministry of the Environment Affairs, 2001).

The industrial sector is known to be a source of various forms of environment pollution in Palestine, producing hazardous chemical pollutants and solid, liquid and gaseous waste. This situation needs to be assessed, monitored and corrected.

3.9.3. Transport and telecommunications sector

The transport sector has an equal importance with all other sectors for achieving economic development and social welfare. It also plays a major role in achieving territorial contiguity within the Palestinian society.

The current use of traditional modes of transport is a source of environmental pollution, due to gas emissions from fuel combustion in vehicles, such as sulfur oxides, nitrogen oxides, carbon monoxide, suspension materials and others. Transport is also a primary source of increasing levels of noise and migration of living organisms, which negatively reflects on health, environment and society. Furthermore, the construction of new road networks in response to the increasing number of transport means is in fact causing further pressure on the Palestinian environment by changing the pattern of land use for this purpose.

On the other hand, the telecommunications sector continues to evolve and spread, requiring an expansion of services and infrastructure networks, including stations for cellular transmission, radio and TV broadcast, and others. All of this result in non-ionizing radiation, which needs to be controlled and monitored in order to prevent its adverse impact on humans and the biological environment.

3.9.4. Agricultural sector

Agriculture is a main economic sector contributing to around 8.1% of GDP in 2007. This sector largely overlaps with the environment. The used agricultural patterns, amounts and ways of fertilizer and pesticide use, water quantities needed for agricultural uses, and emerging zoonotic diseases, all have evident environmental effects, particularly on biodiversity, soil pollution or salinity, land uses, desertification, groundwater contamination and others.

Proper development and management of this sector would have an important impact on sustainable environmental development, since the increase of green areas, improved management of pastures, development of water harvesting methods, achievement of food security, and overall development of agriculture and irrigation patterns and methods will support protection of the environment and environmental resources.

3.9.5. Tourism sector

Investment in this sector, increasing tourism facilities, and increasing number of tourists will have a clear impact on the environment. Major implications may include an increased pressure on natural resources, increased waste generated by this sector causing pollution to the environment, and damage to some of the antiquities in the absence of controls or due to improper handling by tourists.

In order to reduce the negative effects of traditional tourism on environment and in order to ensure that tourism has a positive role in preserving the environmental and natural heritage and achieve a balance between tourism and environment on the one hand and between tourism and economic and social interests on the other hand, a new form of tourism known as eco-tourism has been created worldwide and needs further support, attention, and introducing on the national level.

3.10. Legal and institutional framework

3.10.1. Laws and legislations

Environment law: Article 33 of the basic law – amendment provides the constitutional basis for legislations in environment protection in Palestine and all related legislative policies. Law No. 7 of 1999 is the general legal framework that regulates rights and duties in environment protection. This is a relatively modern law regulating the environmental sector that is mainly based on scientific, technical and technological principles. Therefore, the enforcement of this law can only be ensured through a set of executive regulations, technical instructions and requirements. In addition, environment law should be viewed in its inclusiveness and overlapping with a large number of other legislations, such as public health law, agriculture law, water law, natural resources law, labor law among others.

3.10.2. International conventions, international cooperation and international organizations

International treaties: The international community has declared and adopted many resolutions, statements, charters, principles and conventions related to environmental human rights. The number of such conventions exceeds 100, including both direct and indirect agreements. The Palestinian basic law affirms that PNA shall work without delay to join regional and international declarations and conventions that protect human rights. This was also reflected in the environment law, accordingly Palestine is committed to supporting the principles and goals of the different international conventions. However, Palestine participates in these conventions as an observer because it enjoys an observer status in the UN General Assembly and does not enjoy a full member status. This situation weakens and reduces the benefit that Palestine can get from joining these conventions.

International cooperation and international organizations: The ever growing environmental threats to the planet have prompted the international community to pay attention to environmental issues and reinforced the conviction of the need for concerted international efforts to reduce environmental degradation. This has resulted in the creation of international bodies concerned with environmental problems, such as the United Nations Environment Program (UNEP), the Global Environment Facility (GEF), the Global Ministerial Environment Forum, as well as the Council of Arab Ministers responsible for environment at the League of Arab States, and the United Nations Economic and Social Commission for Western Asia (ESCWA). Palestine is benefiting from good and effective relationships with these bodies.

Palestine is also involved in many regional and international programs and projects targeting the environmental sector, which were established to promote regional and international cooperation in the field of environmental development, such as the Horizon 2020 Program, the European Neighborhood Policy, and the Union for the Mediterranean.

3.10.3. Roles and responsibilities

According to the definition of environment in article 1 of the environment law and article 33 of the basic law – amendment, which considers environment protection as a national duty, EQA is the body responsible for conserving and protecting the environment, preserving human health, curbing and reducing the depletion of natural resources, combating desertification and pollution, promoting environmental awareness, and ensuring sustainable development. It shares these responsibilities with a number of other relevant governmental institutions. Sometimes, the overlapping is deep and complex to the extent that it makes it difficult to delineate clear-cut boundaries between the functions and responsibilities of each stakeholder, leading in many cases to conflicts between different institutions on the tasks and responsibilities. In practice, this overlapping has had a significant negative impact on EQA ability to carry out its tasks and responsibilities as identified by the Environment Strategy 2000-2010.

Under the environment law No. 7 of 1999, the environment body was perceived at the level of a ministry, which would enjoy independency and be represented in the Council of Ministers. However, the successive Palestinian governments have not dealt with this body in a consistent manner, leading to a variation in its legal status from time to time. Currently this body is an independent authority rather than a ministry. This means that it has no representation in the Council of Ministers, leading to the delegation of environmental responsibilities to bodies other than the official environment body, the absence of the environment body's viewpoint in discussions and policy formulation at the Council of Ministers' level, and overlapping – if not conflict – of some responsibilities or roles with other bodies which are not necessarily relevant to these issues. There are many examples of this, including the delegation of the Ministry of Local Government by a Council of Ministers' decision to lead the national committee on developing a national strategy for solid waste management, which is in conflict with the explicit provision in the environment law, stipulating that this issue is part of the responsibilities and roles of the Ministry of Environment. In addition, the prevailing perception of this body on part of other ministries is that it is at a lower level than a ministry, and thus cannot lead a committee or a task force with ministries being members thereof.

On the other hand, this body has the duty, under the law that regulates its functioning, to monitor the performance of all other institutions from the perspective of environment protection and sustainable development. Hence, the independence of this body is a prerequisite. Affiliation to any other institution would decrease its effectiveness and create a state of conflict of interests and responsibilities.

Therefore, this body should receive more attention at the political level and should enjoy more financial and administrative support. It should stay independent and should be promoted to a ministry level in order to be at the same footing with other ministries and enjoy a permanent representation in the Council of Ministers. This would allow the environment "voice" to be heard and create a balance and harmony in terms of roles, responsibilities and powers. A quick look at other countries in the world and the region will demonstrate the level of concern with environment and attention to the environment body. In many countries of the world, this body is one of the institutions with highest influence in terms of guiding and making decisions.

On the other hand, environment has been recently adopted as a new sector within the infrastructure sector as part of the work on developing sectoral strategies. This is a step in the right direction in dealing with the environment sector, but it is not enough. The development of this Sector Strategy has reaffirmed that environment intersects with many other sectors if not all of them. Therefore, it would be more appropriate to adopt a new fifth sector at the state level in addition to the economic, social, governance and infrastructure sectors, to be known as natural resources and environment sector, similar to the adopted approach in the preparation of the early recovery plan for Gaza Strip.

3.10.4. Relevant stakeholders

Judicial authority: In addition to courts at all levels, this authority also includes the public prosecutor's office, the police and lawyers' sector. The Palestinian judiciary is currently witnessing a stage of overall development. However, 10 years after the environment law has become in force, environmental issues are not perceived as a priority so far and even do not receive the same level of attention as other issues.

NGO sector: Prior to PNA establishment, NGO work in Palestine was focusing on social issues and human rights in general. With the increased global attention to environmental issues, a number of active NGOs in the field of environment were established. According to official records, there are around 40 NGOs working in the field of environment in Palestine. NGOs have many responsibilities in the implementation of activities in environment protection. They play an apparent role in different areas, such as environmental awareness, community participation, environmental research and pilot projects. Their level of activity is varied: there are some strong and active NGOs playing a major and visible role; there are small NGOs limiting themselves to some low-profile and irregular activities, while there are inactive NGOs.

Coordination between NGOs and the official sector is somewhat weak, whether in terms of planning and policy development or in the implementation of projects and activities. This is creating a state of fragmentation of work and competition at the national level, which may divert plans and programs away from their objectives. In addition, a unified system regulating the work of NGOs and ensuring complementary work with official institutions is lacking. Wherever such frameworks are available, they seem less effective than they should be.

Private sector: The private sector is a key player in environmental policies because its projects and activities have a direct impact on the environment. Nevertheless, the private sector does not exhibit the required level of commitment to the environment, although there are clear and explicit requirements in the environment law and the environmental assessment policy to this effect. There is a need to strengthen the role of the private sector to move from a polluter of the environment to a catalyst in reducing environmental impacts by shifting towards recycling, production of alternative energy, clean production ...etc.

In addition, many private companies assume technical works related to environment protection. This partnership must be strengthened and upgraded. Furthermore, the informal private sector is playing an important role in waste recycling, which needs to be further developed, encouraged and regulated.

Individuals and citizens: Basically all activities related to environment protection are aimed at humans and their right to enjoy safe and healthy environment. However, with the abundance of daily concerns, Palestinian citizens put the environment low on the list of their priorities. Therefore, it will be very difficult to ensure success of any efforts aimed at protecting the environment without creating a sufficient level of belief among the Palestinians of the importance of environment in improving their daily lives and ensuring their existence and survival.

Often individual citizens do not contribute by the minimum, such as payment of charges for environmental services provided to them by local bodies (such as water, wastewater, and solid waste). This is in fact weakening such bodies and restricting their ability to perform their duties. In a nutshell, there is a need to devise many activities addressed to Palestinian citizens in every age group or class with the aim to raise the level of their environmental awareness and increase their knowledge.

3.11. Achievement and assessment

Achievement: Despite all financial, institutional, legal and political constraints and obstacles and the Israeli occupation control over the Palestinian environment components, EQA has made evident achievements towards the realization of its mission of **"Maintaining and protecting the environment, preserving human health, curbing and reducing the depletion of natural resources, combating desertification, preventing the aggravation of environment pollution, promoting the environmental awareness and ensuring achievement of sustainable environmental development."** Among these achievements:

- in December 1996. the Palestinian Environment Authority was created as the official Palestinian body concerned with protecting the Palestinian environment and preserving what is still available of its resources, and responsible for strategic planning, legislation, monitoring and development of executive regulations for environment protection.
- In 1996, several studies and reports were completed, including the biodiversity strategy in Palestine and the associated action plan, in addition to study on liquid waste treatment and reuse and a study on development of grazing areas.
- In 1998, the Palestinian State Ministry for Environment Affairs was established and the Palestinian Environment Authority was incorporated within it.
- In 1999, the Palestinian environmental strategy was developed as the first Palestinian attempt of strategic planning in the environmental sector.
- The environment law No. 7 of 1999 was enacted by the Legislative Council.
- Late in 2000, a study was completed on nature during war – the Israeli aggression on environmental security in Palestine.
- Late in 2000, a study was developed on the Israeli aggression on the Palestinian environment during Al-Aqsa Intifada.
- In 2003, a desk study was prepared on the state of environment in Palestine through UNEP.
- In 2005, EQA organizational structure was approved by the cabinet.
- In 2006, the third national report on biodiversity protection in Palestine was prepared.

- In 2007, a project on integrated management of watershed in Far'a Basin was implemented in partnership with EU and Jordan.
- In 2008, the reform and development plan on environment was developed and approved to be implemented over a 3-years period between 2009-2011.
- In 2009, a report was developed assessing the environmental impact of the latest Israeli war on Gaza through UNEP.
- In 2009, a report was prepared on climate change assessment in Palestine.
- In 2009, a strategy was developed to adapt with climate change in Palestine.
- The sectoral working group on environment was established, involving the national stakeholders and concerned donors and international organizations.
- Ongoing monitoring of the implementation of environment monitoring and inspection program and giving the environmental approvals.
- Following up of several programs for raising environmental awareness and knowledge.
- A project was implemented to create the natural reserve in Wadi Gaza.
- Representation of Palestine in several international conferences and meetings on environmental protection.
- Participation and cooperation with Palestinian local institutions, companies and universities in the organization of several conferences on the Palestinian environment and its protection.
- Work is underway on the development of a national strategy on solid waste management in the Palestinian territory in cooperation with relevant institutions.

In spite of the achievements made, there are several planned activities that have not been completed for several reasons, including political and administrative ones, such as lack of funding and necessary equipment and laboratories, and in some cases lack of specialized cadres. With reference to the PRDP 2008-2010, EQA presented 32 priority proposals in the environmental sector, but the plan adopted only one of the submitted proposals. Even the only proposal adopted from this list has not been implemented due to lack of financial resources. However, EQA has worked on implementing some of those activities based on its own efforts and limited resources.

With regard to the early recovery and reconstruction plan in Gaza Strip, none of the projects that were assessed as a priority in addressing the situation in Gaza was implemented. If any of those projects have been implemented, no documentation is available to measure the quantity and quality of the implementation.

On the other hand, a report on the Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008- January 2009 was developed through UNEP. The report proposed a list of interventions and projects required to deal with the emergency situation there, but none of those interventions has been implemented.

Evaluation: The following table demonstrates major strengths, weaknesses, opportunities and threats facing the environmental sector.

Table 1: SWOT Analysis: strengths, weaknesses, opportunities and threats

<p>Strengths:</p> <ul style="list-style-type: none"> - Availability of environmental law regulating the work in this sector as a whole - Availability of official institution on environment with clear organizational structure established by an official decision to address environmental issues - A number of qualified and specialized personnel in the field of environment are available - A number of NGOs and civil society organizations are active in the field of environment - High education rate and a good level of awareness and knowledge about environmental issues among citizens and different social groups - There are Several environmental studies addressing various topics in the environmental sector - There are Several environmental awareness programs for different social groups - Inclusion of environment into educational curricula - There is a number of Palestinian governmental and non-governmental academic and research institutions concerned with environmental issues - There is a number of periodic environmental surveys conducted by PCBS 	<p>Weaknesses:</p> <ul style="list-style-type: none"> - Incomplete development of regulations and the bylaws of the environmental law - Inadequate enforcement of the environmental law and other related laws - Lack of an executive body to enforce the environmental law, such as an environment police - no considering of the environment at the same level as other issues before courts and in the judiciary - Lack of adequate environmental information in the form of a comprehensive, clear, accurate and up-to-date database. - Clearly inadequate governmental system in daily monitoring of issues of environmental violations and transgressions - Lack of adequate experience in managing environmental emergencies and crisis situations - Small number of technical staff in environmental official body (EQA) - Lack of harmony and accord between the different national institutions in terms of planning, implementation and other aspects. - Conflict and contradiction between applicable Palestinian laws, leading to conflict of responsibilities and competition on roles - not offering the environment the due attention by successive Palestinian governments - Lack of a control and monitoring system for the different environmental elements and for pollution resulting from various sources - no considering of the environment as a basic element when working on the different development plans, reflecting lack of commitment to the environment by the different development sectors - Inadequate coverage of infrastructure services (solid waste, liquid waste, water networks) - Lack of specialized data in some environmental issues, such as hazardous waste - Shortage of financial resources for environmental sector development - Inadequate environmental awareness and knowledge among various social groups
<p>Opportunities:</p> <ul style="list-style-type: none"> - A general trend by the PNA to regulate 	<p>Threats:</p> <ul style="list-style-type: none"> - Aggressions, violations and destruction

the different sectors including the environmental sector which was endorsed as an active sector, which would allow institutional, financial and legal support to EQA

- There are potentials to involve the private sector in environmental issues
- Global and international interest in environment and allocation of much of the financial support to this sector
- Potentials for cooperation, integration and harmonization with governmental and non-governmental academic and research institutions
- Several international environmental conventions which ensure the rights of states and nations under occupation in environmental protection

practiced by the Israeli occupation against the Palestinian environment

- Obstacles created by the Israeli occupation hindering Palestinian development in all fields
- Lack of control over various natural and environmental resources that form the basis for environmental action
- Global environmental problems and phenomena, such as climate change and the associated effects, including desertification, scarcity of water resources, decline of green area, etc
- International financial challenges and increased poverty and unemployment, which divert attention away from environment
- The current political situation in the Palestinian territory and the divergence between the two parts of the country

4. Priorities and strategic objectives

Based on the current status analysis, the assessment of achievements and failures and the SWOT analysis, six priorities and strategic objectives were identified for the environmental sector strategy for the period 2011-2013. Yet those strategic objectives could be valid for long term as well. These objectives are:

1. A clean, safe and pollution free Palestinian environment.
2. The natural environment and cultural heritage in Palestine are preserved and maintained.
3. Palestinian natural resources are managed in a sustainable manner.
4. All measures required to adapt with climate change, combat desertification and confront environmental and natural disasters are taken.
5. The institutional and legal environmental framework is strong, effective and working in an integrated and concerted manner.
6. The State of Palestine is committed to international conventions and treaties on environment.

5. Sectoral policies

In order to achieve the above-indicated strategic objectives, and based on the current status analysis of the Palestinian environment and all its problems and gaps, a number of sectoral policies were developed. To implement these policies, a number of interventions were developed, which take the form of activities in certain cases and the form of programs that include several activities in other cases. These policies and interventions are explained in detail in annexes A and B in the strategy document. The following is a brief description:

1. Policies aimed at achieving a clean, safe and pollution free Palestinian environment

- Controlling the different sources of pollution
 - Assess and reduce emissions from industrial establishments.
 - Develop instructions and regulations and provide the required resources to control the gaseous emissions from vehicle exhausts
 - Develop a system to encourage the use of clean and alternative energy and implement pilot projects
 - Control the different sources of environmental noise
 - Control the ionizing and non-ionizing radiation sources
 - Address and treat the hot polluted spots
 - Activate the monitoring systems of air, water and soil quality
 - Control and monitor quantities and types of fertilizers and pesticides in use
 - Monitor the quality of the Mediterranean waters
 - Control sources of water pollution and rehabilitate the coastal aquifer in Gaza Strip

- Promoting the behaviors associated with environment preservation and increasing public environmental awareness
 - Establish environmental clubs
 - Complete the integration of environmental education into curricula at the different levels of education
 - Activate the instruments or tools of environmental media
 - Organize environmental awareness campaigns targeting different social segments
 - Establish a national center for environmental training and education purposes
 - Develop a plan to promote environment-friendly initiatives

- Improving systems for the management of liquid, solid and hazardous waste
 - Expand the scope of solid waste collection services and sanitary landfilling to include all communities in all governorates
 - Remove the debris of buildings (construction waste) resulting from the war on Gaza
 - Close and/or rehabilitate the random dump sites
 - Develop a plan to encourage initiatives and systems to reduce, separate, reuse and recycle the solid waste and to collect gases emitted from sanitary landfills.
 - Develop a plan to encourage private sector initiatives and contributions in the solid, liquid and hazardous waste management.
 - Establish a system (legislative and physical) for handling and transport of hazardous materials
 - Establish a system (legislative and physical) for the management of hazardous waste
 - Implement and follow up the recommendations of the national solid waste management strategy
 - Expand the scope of wastewater collection, treatment and reuse services and rehabilitate the existing networks and treatment plants
 - Develop and enforce instructions on primary treatment of industrial wastewater

- Develop a plan to establish small-scale and domestic treatment plants

2. Policies leading to sustainable management of Palestinian natural environment and cultural heritage

- Rehabilitating and managing natural reserves and the coast
 - Conduct a field survey to assess the status of biodiversity
 - Develop a plan to protect biodiversity and preserve endangered species
 - Develop plans to regulate and manage natural reserves, national parks and the coast
 - Implement a project for the protection and development of wetlands
 - Develop a regulation for bio-safety
- Protecting the landscape and preserving the cultural heritage
 - Develop regulations and plan to protect and improve the landscape
 - Maintain and rehabilitate the natural and cultural heritage sites
 - Develop a plan to develop and promote eco- tourism

3. Policies leading to sustainable management of natural resources

- Regulating the utilization of available natural resources
 - Develop plans and instructions for the use of natural resources
- Regulating land uses
 - Develop a national master plan for land use

4. Policies aimed at adopting and implementing all measures required to adapt with climate change, combat desertification and confront natural disasters

- Enhancing the capacity to deal with emergencies and natural disasters
 - Develop national plans to deal with the situations of earthquakes, draught and floods
 - Develop national plans to deal with accidents of hazardous materials and its waste and leakage of oil products
 - Establish, equip and train a commission for environmental emergencies to deal with environmental disasters and their consequences
- Enhancing the measures for adaption with climate change
 - Use agricultural patterns and methods that can adapt with the effects of climate change
 - Implement programs to develop water harvesting systems
 - Implement programs to raise awareness on how to adapt with climate change
 - Expand the use of alternative and non conventional water resources
- Combating desertification
 - Develop a national strategy and funding mechanisms to combat desertification
 - Implement the outputs of desertification combating strategy
 - Develop a plan to manage and rehabilitate grazing areas

- Cultivate additional areas of lands to increase the size of green areas
- Rehabilitate and reclaim lands vulnerable to erosion

5. Policies aimed at activating and strengthening the institutional and legal environmental framework to work in an integrated and concerted manner

- Developing the institutional work in the environmental sector
 - Review and assess institutional structures of the environmental sector
 - Define roles and responsibilities of environmental sector institutions
 - Establish an executive body to enforce the environment law and relevant legislations and activate the role of judicial authority
- Developing the legal framework which regulates the work in the environmental sector
 - Review and update the environmental law and the relevant laws
 - Issue regulations and bylaws related to the environmental law
 - Issue the required instructions, technical specifications, indicators, standards and criteria according to the environmental law
- Enhancing the capacity of environmental institutions
 - Build the capacity and empower the staff of EQA and the environmental sector institutions
 - Establish an environmental information center and issue a periodical state of environment
 - Establish reference environmental laboratories
 - Establish a system to monitor air, water, and soil and cross-border pollutants
 - Conduct a study to assess the status of environmental scientific research
 - Develop a plan to develop scientific research and technology transfer in the field of environment

6. Policies aimed at enhancing the role and commitment of Palestine as a full state party in international conventions and treaties on environment

- Enhancing the role of Palestine in international conventions and treaties on environment
 - Assess the Palestinian participation in international conventions on environment
 - Bring national legislations into line with the requirements of the international environmental conventions
 - Mobilize efforts and capacities to represent Palestine in the international environmental conventions as full membership status
 - Document the Israeli occupation's violations against the environment and follow up them in the framework of the international law
- Encouraging environmental initiatives and cooperation with the Arab states, the countries of the region and the international organizations
 - Assess participation in Arab and regional environmental agreements and ensure the requirements to benefit from them
 - Assess Arab and regional environmental projects and increase benefits from them.

This large number of interventions outlined above is ambitious compared with the time available for the implementation, which is a 3-year period 2011-2013. Nevertheless, this large number of interventions reflects the urgent need to develop this sector, which is suffering from many problems and gaps as previously explained in the status analysis. Given the previous experience of work in this sector, the implementation of all listed interventions could be difficult because of the ever changing political conditions, the unpredictable and inadequate availability of financial resources, in addition to the legal and institutional obstacles that may be encountered in the implementation of this plan and its interventions. Therefore, those interventions were listed according to their priority with regard to how much they contribute to developing and upgrading this sector. Major criteria taken into account in this prioritization included: contribution to state-building, impact on health and environment, impact size (in terms of population and geography), compatibility with the current legal framework, intervention implementation and monitoring possibilities (financial, human, and technical), capacity development of the sector and services, cost-effectiveness, and perceived risks that may affect the implementation of the intervention.

When all interventions were examined against the above-listed criteria with the participation of all sectoral stakeholders, the interventions were listed in order of priority in the following way (Table 2). The interventions were classified into two groups: the first group included priorities and interventions to be implemented specifically by EQA. While the second group included priorities and interventions of sectoral concern to be implemented by other stakeholders in the sector.

Table 2: List of interventions in order of priority¹

Priority order	Intervention (to be implemented by EQA)	Priority order	Intervention (to be implemented at the environment sector level)
1.	Issue regulations and bylaws related to the environmental law	1.	Control sources of water pollution and rehabilitate the coastal aquifer in Gaza Strip
2.	Issue the required instructions, technical specifications, indicators, standards and criteria according to the environmental law	2.	Expand the scope of solid waste collection services and sanitary landfilling to include all communities in all governorates
3.	Build the capacity of, and empower the staff of EQA and the environmental sector institutions	3.	Expand the scope of wastewater collection, treatment and reuse services and rehabilitate the existing networks and treatment plants
4.	Document the Israeli occupation's violations against the environment and follow up them in the framework of the international law	4.	Close and/or rehabilitate the random dump sites
5.	Establish an environmental information center and issue a periodical state of environment	5.	Remove the debris of buildings (construction waste) resulting from the war on Gaza
6.	Review and update the environmental law and the relevant laws	6.	Establish an executive body to enforce the environment law and relevant legislations and activate the role of judicial authority
7.	Review and assess institutional	7.	Expand the use of alternative and

¹ No. 1 reflects the highest priority.

	structures of the environmental sector		non-conventional water resources
8.	Define roles and responsibilities of environmental sector institutions	8.	Develop a national master plan for land use
9.	Implement and follow up the recommendations of the national solid waste management strategy	9.	Cultivate additional areas of lands to increase the size of green areas
10.	Activate the monitoring systems of air, water and soil quality	10.	Implement the outputs of desertification combating strategy
11.	Establish a system to monitor air, water, and soil pollutants and cross-border pollutants	11.	Establish, equip and train a commission for environmental emergencies to deal with environmental disasters and their consequences
12.	Address and treat the hot polluted spots	12.	Implement programs to develop water harvesting systems
13.	Establish a system (legislative and physical) for the management of hazardous waste	13.	Complete the integration of environmental education into curricula at the different levels of education
14.	Develop and enforce instructions on primary treatment of industrial wastewater	14.	Develop a plan to establish small-scale and domestic treatment plants
15.	Develop instructions and regulations and provide the required resources to control the gaseous emissions from vehicle exhausts	15.	Use agricultural patterns and methods that can adapt with the effects of climate change
16.	Assess and reduce emissions from industrial establishments	16.	Rehabilitate and reclaim lands vulnerable to erosion
17.	Organize environmental awareness campaigns targeting different social segments	17.	Develop a system to encourage the use of clean and alternative energy and implement pilot projects
18.	Develop a national strategy and funding mechanisms to combat desertification	18.	Develop a plan to encourage private sector initiatives and contributions in the solid, liquid and hazardous waste management
19.	Establish a system (legislative and physical) for handling and transport of hazardous materials	19.	Maintain and rehabilitate the natural and cultural heritage sites
20.	Conduct a field survey to assess the status of biodiversity		
21.	Establish a national center for environmental training and education purposes		
22.	Develop a plan to protect biodiversity and preserve endangered species		
23.	Activate the instruments or tools of environmental media		
24.	Establish environmental clubs		
25.	Develop national plans to deal with the situations of earthquakes, draught and floods		
26.	Establish reference environmental laboratories		
27.	Develop plans to regulate and		

	manage natural reserves, national parks and the coast		
28.	Develop plans and instructions for the use of natural resources		
29.	Develop national plans to deal with accidents of hazardous materials and its waste and leakage of oil products		
30.	Control the ionizing and non-ionizing radiation sources		
31.	Implement programs to raise awareness on how to adapt with climate change		
32.	Control the different sources of environmental noise		
33.	Develop a plan to encourage initiatives and systems to reduce, separate, reuse and recycle the solid waste and to collect gases emitted from sanitary landfills		
34.	Control and monitor quantities and types of fertilizers and pesticides in use		
35.	Implement a project for the protection and development of wetlands		
36.	Monitor the quality of the Mediterranean waters		
37.	Develop a plan to promote environment-friendly initiatives		
38.	Develop a plan to develop and promote environmental tourism		
39.	Develop a plan to manage and rehabilitate grazing areas		
40.	Develop a regulation for bio-safety		
41.	Conduct a study to assess the status of environmental scientific research		
42.	Develop a plan to develop scientific research and technology transfer in the field of environment		
43.	Develop regulations and plan to protect and improve the landscape		
44.	Assess the Palestinian participation in international conventions on environment		
45.	Assess participation in Arab and regional environmental agreements and ensure the requirements to benefit from them		
46.	Mobilize efforts and capacities to represent Palestine in environmental conventions as full membership status		
47.	Bring national legislations into line		

	with the requirements of environmental conventions		
48.	Assess Arab and regional environmental projects and increase benefits from them		

6. Allocation of resources and responsibilities

Estimated costs of interventions and activities necessary for achieving the objectives of the Environment Sector Strategy 2011-2013, as detailed in Annexes A and B and summarized in the tables above, are around 5.5 billion NIS distributed on 15 policies. These intervention mostly constitute ongoing long-term development programs. Hence the estimated costs should be also long-term in order to ensure continuity of implementation. Costs attached here to each intervention are only provisional estimates and may prove less or more. The final precise costs will be determined later upon developing the design and details of each project.

Activities and interventions in the Palestinian Environment Sector Strategy 2011-2013 as detailed in Annexes A and B require the involvement of most PNA institutions, in addition to civil society organizations, the private sector, universities, research centers and international organizations. EQA will have the leadership, supervision and monitoring of the implementation of these policies and interventions.

7. Monitoring and evaluation

Monitoring the implementation of any strategy is essential to verify progress and assess the extent to which the objectives are being met. The optimal way to do so is by setting a number of indicators measuring the achievement of objectives. In order to facilitate such monitoring and assess progress, these indicators should be clear, specific, measurable, and time-bound.

Under this strategy, two categories of indicators were developed: The first category is directly built on the outcomes of the implementation of each intervention. These indicators are presented in Annex B next to the corresponding interventions. Hence their number is equal to or more than the number of interventions.

The second category contains indirect indicators, which are not directly related to the interventions but rather would be an indirect outcome of their implementation. These are used to measure progress in improving the quality of environment in general terms. The following are examples of such indicators:

1. Proportion of households disposing of wastewater in sanitation networks
2. Proportion of households with access to solid waste collection services
3. Proportion of green areas
4. Proportion of solid waste disposed in sanitary landfills
5. Proportion of solid waste separated and recycled
6. Proportion of wastewater treated
7. Quantity of treated wastewater that is being reused

8. Proportion of population with access to safe water sources
9. Percentage of pollutants' concentration in water sources
10. Percentage concentration of gaseous emissions and suspensions in the air
11. Quantities of carbon dioxide produced per capita
12. Proportion of endangered species in the biodiversity
13. Area of reserves designated to preserve species

Similar to other countries, Palestine is committed to the Millennium Declaration and the Millennium Development Goals (MDGs) issued in 2000 and sought to be reached by 2015. Environment protection is a main goal in this Declaration, specifically addressed by MDG 7: Ensure environmental sustainability. There is a sizeable accord between the targets and indicators under this goal on one hand and interventions and indicators in this strategy on the other. This is an indication that Palestinian efforts are on the right track towards achieving the MDGs.