Impacts of Urban Decay on the Environment: The Case of Qalqilia City in oPt

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1- Introduction:

Recently, urban planning in oPt is concerned with the ordering and designing of governorates, including villages and municipalities. In order to explore different aspects of the built and social environments of the urbanized areas, urban planning requires an integration of land use planning and transport planning. On the other hand, urban planning should consider protecting the environment through the controlling of pollution and isolating activities that are environmentally incompatible (Millar, *et..al* ,1997).

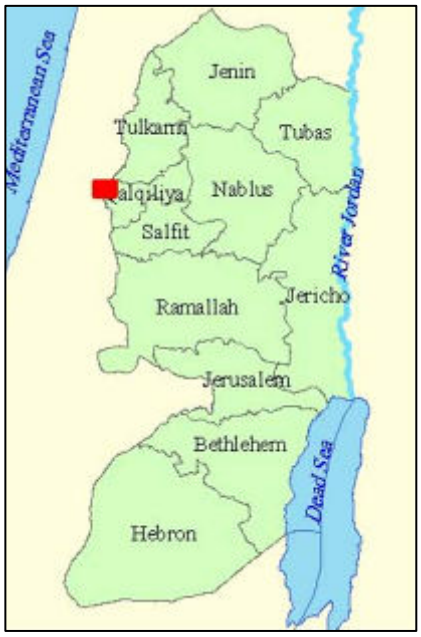


Figure 1: Location of Qalqilya City (*www. palmap.org*)

In oPt , especially the north of West Bank, and according to many studies and researches, it has observed a dramatic environmental urban planning mainly due to colonizing policies such as building of Israeli settlements, the Apartheid Wall and check points that turned West Bank into large number of isolated cantons. There has been a recognized absence of proper urban and strategic planning, and the existing urban structure of cities is intensely damaged and abused. The role of environmental urban planning is becoming gradually more important for the Palestinian cities which continue to grow and cause pressure on the existing infrastructure sectors; energy, water, and transportation.

This study describes the obstacles in urban planning based on *Strengths, Weakness, Opportunities, and Threats* analysis (SWOT), and environmental impacts of urban decay in the city of Qalqilia in oPt (**Figure 1**) that suffers from many restrictions, bad situation, and it has been completely surrounded by Apartheid Wall from all sides leaving only one entrance for their inhabitants. This has dangerous disaster of urban decay, it is characterized by; depopulation, economic crisis, high rate unemployment, political stresses, unsociable urban landscapes, and polluting water resources and atmosphere.

This study suggests that the sustainable urban development in Qalqilia can be achieved by, focusing on tourism, agribusiness activities, and replacing old houses with new vertical buildings.

2- Qalqilia:

Qalqilia city is situated about 14 km from the Mediterranean coast, the altitude ranges from 40 to 150 m above sea level, and it covers approximately 3.5 km2 as shown in **Figure 2a**. The satellite images show the Apartheid Wall (see Appendix A), it is around 11 km long. Qalqilia has approximately 40,000 inhabitants (PCBS, 2007), the population density is approximately 11,429 persons per km^2. In addition, it has the least available area for construction in oPt (Qalqilia Municipality, 2008). The agricultural areas, (**Figure 2b**), in Qalqilia governorate is classified as follows; 72.7% C, 25.3 % B, and 2.1 % A (ARIJ, 2007). A area is the only place where construction can be started and approved easily.

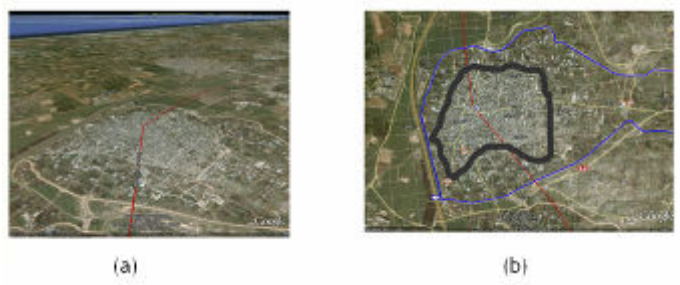


Figure 2. a) 3D-Satellite image of Qalqilia b) blue line is the Apartheid Wall and grey line is the buildup area, the area enclosed between the two lines is the agricultural areas.

2.1 Existing situation of wastewater and water supply systems in Qalqilia

Wastewater: most of Qalqilia city is served by sewer network. The discharged wastewater mixes with the wastewater flows from the nearby Kibbutz "Alfeh Menasheh" to form a stream and then sent to a treatment plant near Kfar Saba (ARIJ Survey, 1996). This wastewater treatment plant creates many problems such as bad smells and insects to the people and farmers living inside the Apartheid Wall. Groundwater pollution was noticed in the wells located few hundred meters away. This endangers the environment in the whole area. (ADA, 2007).

Water: the water network in Qalqilia city covers 100% of the city with a leakage of 45%. Water price there (around 0.25 US$/ m3) is one of the cheapest prices in oPt. There are 6 domestic wells and 72 irrigation wells in Qalqilia sub-district as shown in **Figure 3**. The 2 main municipal wells; Al-Mashrou and Sofin produce 320 and 280 m3/hr respectively. In Alfe Manashe enclave alone, more than 9 high-yielding local wells were confiscated, leaving several communities to rely on other resources for domestic and irrigation water supply (PHG, ADA, 2007).

Figure 3. Groundwater wells in Qalqilia district (source PHG).

3- Urban Planning

A study form Al-Najah University, Palestine, showed that the followings were the main obstacles in urban planning of Qalqilia; a) existing random development b) absence of regulations and enforcement, C) lack of communications between planner and community (Anaya, 2004). However, recently the limited area because of the Apartheid Wall can be considered as the main obstacle.

3-1 SWOT Analysis for Qalqilia City Urban Development:

A SWOT analysis, **Table 1**, **2**, and **3**, has been conducted in order to make a vision for future development. This analysis was based on literatures, interview with Qalqilia Municipality, and individual experience in the city. Discussion and analysis were made for eight sectors; tourism, water, agriculture, environment, infrastructure, land use, commerce, and housing. Among these sectors, agriculture, tourism and water resources were selected as key factors. The results of the SWOT analysis are as follows:

Table1. Summary of SWOT Analysis on tourism for Qalqilia city

Strengths: -Warm climate in winter -Has the only Animal Zoo in West Bank.	*Weaknesses:* -Lack of marketing in tourism -Lack of infrastructure for tourist services -Lack of attractive souvenirs for tourists -Lack of tourism education for guides
Opportunities: - Qalqilia as a region of tourism	*Threats:* -Unstable political situation -Israeli check point at the entrance of the city

Table 2. Summary of SWOT Analysis on agriculture for Qalqilia city

Strengths: -Warm climate in winter -Fertile land for agriculture -Rich of water resource	*Weaknesses:* -Lack of marketing -Lack of scientific techniques on improvement of agriculture products -Limited areas for agriculture

Opportunities: - Well-organized agricultural associations - Export of agricultural products	*Threats:* - Situation of currently being under occupation - Low prices due to competition with Israeli products -Urbanizing the agricultural lands

Table 3. Summary of SWOT Analysis for water resources for Qalqilia city

Strengths: -Located on the western aquifer -Shallow ground water depth (around 80 m)	*Weaknesses:* -Lack of control of water resources due to Israeli occupation -Limited allowed quantities of ground water -Limited extraction depth of ground water -Poor management of water resources -Lowest prices of water in West Bank
Opportunities: -Exploitation of groundwater - Reuse of treated waste water	*Threats:* - Unstable political situation - Pollution resulting from the untreated Wastewater and solid wastes -Flooding zone because of unplanned urbanizing and Apartheid Wall

The SWOT analysis will lead to various implications in the urban development of Qalqilia city including the followings;

(1) Tourism sector

The tourism sector is one of the leading sectors for future development of the city. It is observed, however, that there is a lack of management, presentation, and guidance in the promotion of tourism for potential visitors. Although; the municipality is working on preparing a GIS-based tourism map for future improvement, it is essential to develop valuable sites as national tourism attractions with appropriate signage, guides, and supporting facilities to attract more tourists and visitors.

(2) Agricultural sector

For the agricultural sector, there is a potential to expand export-oriented agriculture. A new type of agriculture should be developed, not only for the regional economy, but also for harmonized urban development in Qalqilia city.

(3) Water resources

The above two sectors depend on water resources. Therefore, it is important to make maximum use and protection of the limited water resources for domestic and agricultural uses, and properly choosing the land use zones in the city.

3.2 Development concept:

The developed concept for area of tourism as shown in Figure 4 is to involve the following:

- A good marketing in tourism will create good chances for the people to work after the bad economical situation.
- Infrastructure for tourist services; new building area, hotels, swimming pools, ..etc.
- Attractive souvenirs for tourists.
- Tourism education for guides.

The developed concept for area of agriculture is to consider the followings;

Qalqilia is good for agriculture because; warm climate in winter, fertile land for agriculture, and rich of water resource. However, it requires:

- Good marketing
- Scientific technique to improvement of agricultural products
- Protecting the limited agriculture lands
- Creating agricultural projects to encourage people to work in their lands after the bad economical situation.

The developed concept for water resources is to involve the following:
-Rehabilitation of water and wastewater networks, and reuse.
-Integrated water resources management.
-Protecting water resources from pollution by treating wastewater and solid waste**.**

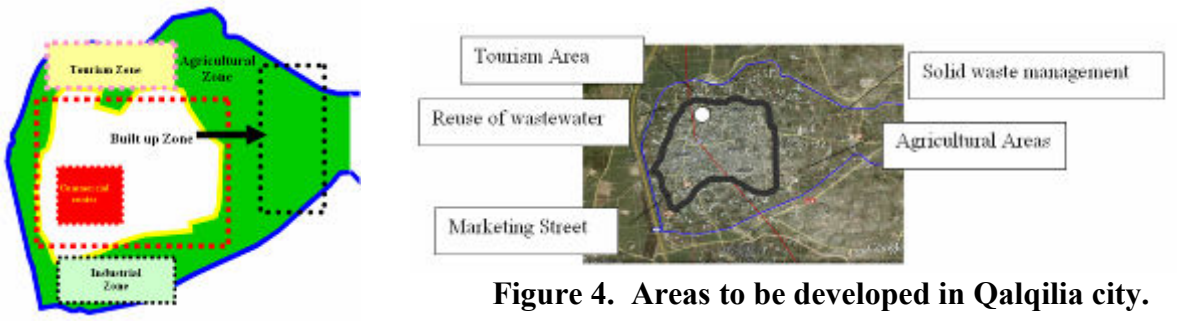


Figure 4. Areas to be developed in Qalqilia city.

4- Urban Decay

Urban decay in Qalqilia is likely to happen according to the following scenarios;

1- Agricultural areas will be changed to buildup areas causing unemployment, depopulation in these areas (Area C). It was found that the urban decay that caused by the Apartheid Wall may affect the agricultural sector, according to MAS (MAS, 2005).

2- Existing buildup areas will expand vertically, accordingly, population density will be increased and infrastructure and services (water and wastewater networks, solid waste management, electricity, roads, ..etc) will be overloaded. **Figure 5** shows buildup areas in Qalqilia from 1964- 2000 (Anaya, 2004).

Figure 5. Buildup areas in Qalqilia from 1964-2000.

3-pollution in Qalqilia caused by; domestic wastewater from Qalqilia city and wastewater from Israeli settlement, and poor solid waste management

wastewater: the generated wastewater form Qalqilia city is estimated by: 80% x 40,000 c x 0.1 m3/d/c =3200 m3/d, assuming that after 16 years the population will be 80,000 then the generated wastewater will be 6400 m3/d.

solid waste: the generated solid waste is estimated by: 1 kg/c/d x 40,000 = 40 Tons/d of solid wastes, after 16 years the amount will be 80 Tons/d.

These large amounts of untreated wastewater and solid wastes, if not environmentally managed, will pollute the existing water resources, cause health risks, and bad odors.

Groundwater may also contaminated by floods and surface runoff in winter, **Figure 6** shows DEM data and the corresponding flow directions of floods. However, the expected change in land use, mainly change of agricultural lands to buildup areas **Figure 6**, will reduce infiltration and increase surface runoff in the down stream. Appendix A shows some the recent flood events and the corresponding damages. Accordingly, local aquifers in Qalqilia are exposed to pollution danger as the inadequate sewage collection network discharges wastewater into nearby wadis and mixed with the polluted surface runoff from Qalilqila city.

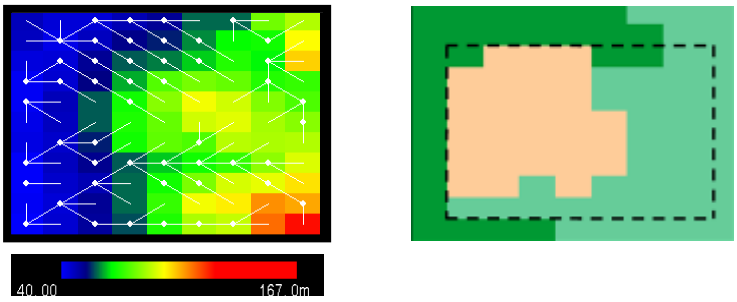


Figure 6 Flow directions of surface runoff and existing land use in Qalqilia, dashed line is expect extension of buildup areas. (DEM and land use data were extracted from Google map) DEM of Qalqilia. (Mesh size 180 m x 240 m)

5-Recommendations

Political efforts should be concentrated in order to get the rights of Qalqilia city, according to the International Law, in its lands and water that are located outside the Apartheid Wall. These occupied lands and thieved water will enable Qalqilia to expand horizontally and provide a better environment for urbanizing. However, before realizing these rights the following measures may be considered for further analysis, environmentally and economically;

- Developing tourism and agribusiness activities.
- Introducing well-organized vertical urbanizing to replace existing old houses. This requires a proper infrastructure; proper water and wastewater networks, wastewater treatment, sanitary landfill, roads, electricity, services, ..etc.

6- Acknowledgement

The Authors would like to thank the Engineering Department at Qalqilia Municipality for providing necessary information.

7- References:

1- Applied Research Center-Jerusalem (Arij). Status of the Environment in the Occupied Palestinian Territory, pp. 78, 2007.
2- Austrian Development Agency. Water Sector Review: West Bank & Gaza, Water Consultant to the Austrian Development Agency for Palestine/Israel/Jordan – Jansen & Consulting Team, 2007.

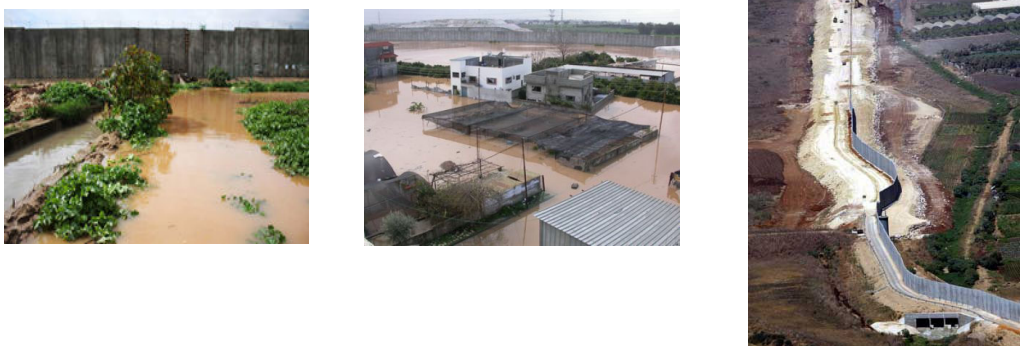
3- Focus Qalqilia and Tulkarem 2003vol.1 UNDP is published by United Nations Development Programme /Programme of Assistance to the Palestinian People http//www.papp.undp.org)
4- Millar D., Roo G., Urban Environmental planning: Policies, Instruments and Methods in an International perspective,1997.
5- Palestinian Central Bureau of Statistics (PCPS): http://www.pcbs.gov.ps
6- Palestine Economic Policy Research Institute (MAS), Report: The Economics of Agriculture in the Qalqilya and Tulkarem Districts: Improving the Profitability of Farmers Affected by the Separation Wall. http://www.mas.org.ps, 2005.
7- Palestinian Hydrology Group (PHG).

8- Qalqilia Municipality : http://wall.qalqiliamun.ps , 2009.
9- رسالة ماجستير/ جامعة النجاح / توزيع و تخطيط الخدمات العامة في مدينة قلقيلية بالاستعانة بنظم المعلومات الجغرافية إعداد نضال رفعت احمد عناية .2004

Appendix A: Apartheid Wall

1999 **2002** **2003**

Aerial images of Qalqilia: Photo: GlobalSecurity.org / Space Imaging Eurasia.



(a) (b) (c)

Flooding in Qalqilia (March 12th 2009) (Source Palestinian news agencies) and Aerial image of the Apartheid Wall near Qalqilia, adjacent to the new Trans-Israel highway. Photo: Lefteris Pitarakis / MTI / AP, 2003.