

Situation Analysis and Perspectives of Transboundary Wastewater Management Along Israel/palestine borders

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ABSTRACT

Environmental problems between countries can have deep historical roots and consequences for several reasons. Most environmental transboundary problems are yet to be resolved. Solutions that were developed responded to the forces of political, media, and local Non-Governmental Organisations (NGOs), and did not respond to the needs or reality on the ground. This paper focuses on transboundary wastewater management between Israel and Palestine. The measures undertaken by Israel, the stronger party, and the associated effects on solving the transboundary pollution issues are presented. Of equal importance, procedures followed by the weaker party, Palestine, to resolve the environmental problems are discussed. The responsibility of the donor countries and local NGOs in the conflict is also addressed. Results obtained revealed that the current bi-national agreement does not achieve environmental justice and protection. The stronger party applies stringent standards and guidelines, which go above the technical and financial capacity of the weaker party to achieve sustainable sanitation facilities within its region. A regional cooperative framework with clear coordination mechanism considering the international experience on transboundary management of wastewater and engagement of NGOs and donor countries is needed.

Key words: environmental management; transboundary wastewater; conflict analysis.

INTRODUCTION

According to recent United Nation (UN) data, 33% of the world population (about 2.6 billion people) have no access to adequate sanitation. The construction of facilities, wastewater management, and the promotion of hygiene require high investments that many regions cannot afford. Consequently, 80% of diseases around the world are caused by unsafe water and lack of sanitation services [1]. When such problems cross borders, they call for co-operation. These problems cannot be solved without cooperation between States and help from the rich to the poor countries [2, 3].

Conflict between countries is often due to the absence of binding international law to resolve environmental problems. International humanitarian law (IHL) on environmental protection during armed conflicts lacks clarity in the definition of environmental damage and also lacks legal certainty regarding the protection of components of the environment and civilian targets. Application of the principle of proportionality as harmful to the environment "collateral damage" is also a problem [4]. Conflict resolution is hampered by differences between countries in their capability or resources to deal with decontamination problems [5]. Environmental transboundary conflicts frequently arise because parties' rights and properties are unspecific and not clear. More importantly, the international law of transboundary water tackles only freshwater entails only hints and remarks on pollution issues. In the Israeli-Palestinian case, there is no problem in the human capacity staff to manage the sanitation sector because of the commitment of donor countries to provide training programs for Palestinian technical crews by providing part of the project funding for training and capacity building e.g. Albireh and Nablus west treatment plants. Thus, the solution depends on political will, not on technical issues and needs [6].

It is often difficult to identify the polluter, especially regarding non-point pollution. It is also not clear legally, how and when the polluter should pay, how much, and sometimes even for what. When addressing transboundary pollution, no central authority exists to identify the polluter, mandate enforcement or allocate property rights [7]. Europe failed in the period between 1945-1987 to solve the Rhine River's pollution problem, due to the river's transit between several countries, poor diplomatic relations and the lack of joint or harmonized environmental regulations and laws. After 1987, the Rhine became clean because of the available political climate and only one body applied environmental laws and regulations. Middle Eastern Countries are currently experiencing what Europe suffered from for decades [8].

The historical perspective is useful as a reference showing how water conflicts have arisen and been approached between countries. Attempts to handle transboundary water pollution problems and conditions on the ground form the baseline for future subsequent negotiations and solutions [9]. Israel and Palestine need to face shared border environmental pollution problems that plague water, air and land. This study explores the issue of sewage across the western borders of the West Bank-Palestine flowing towards Israel and to determine the actual bi-national and unilateral technical negotiations between Israel and Palestine over transboundary wastewater. There are many intricacies in the joint water treaties negotiated. The transboundary wastewater subject may give rise to cooperation, but it may also be a source of volatile behaviour [10]. Research efforts on policy development for the wastewater management conflict between Israel and Palestine are still developing and most research work is confined to case studies [11]. Only a few studies have employed conflict analysis as an integrated approach to understand and analyse how to promote sustainable wastewater management on both a local and regional scale [11, 18, 23]

In order to examine how the parties deal with the technical side in the negotiations to resolve the transboundary pollution problem, this study explores the case of Palestinian/Israeli transboundary wastewater. The study present and illustrates in detail the transboundary case study. Next, the paper discusses conflict analysis and the duty of all stakeholders followed by the Parties' response to the conflict. Finally, some conclusions and recommendations are offered about the role of political variability in determining the appeal behind the technical issues and the solution emerging from the media and political pressure. It could be claimed that the negotiation of environmental conflict is not seen in the technical aspects when drafting transboundary pollution agreements.

METHODOLOGY

The analysis of environmental conflict is the foundation for understanding the sensitivity of the conflict itself. It aims at understanding the interactions between the conflicting parties and those who assist them in resolving the dispute [12], and ignoring such analysis could intensify the complexity of the current situation. Subsequently, for the sake of finding a solution, this study focuses on the transboundary wastewater pollution conflict between Israel and the oPt. There are many methods and procedures for addressing environmental conflict, including but not limited to, negotiation, mediation, diplomacy, which eventually would provide general solutions and guidelines on how the conflict could be resolved.

But since each case has its own specificity, these solutions will not be applicable on all cases. Accordingly, this study follows an approach in analysing the conflict; where the conflict history, causes, nature, and parties have been identified in the introduction and the case study sections. The conflict roots alongside the obstacles that prevented reaching a solution were analyzed by concentrating on the conflict level, its impact on human beings' lives, and the technical, social, and political aspects; as well as the parties' interests in this continuing conflict. Furthermore, a conflict map has been used as a tool for analysis; this tool is based on defining the parties by using circles in which the circle size indicates the party's power. The circles are linked by lines where the shape of the line and its size indicate the nature of the link between the parties. In order to reach a win-win result, Stakeholder Analysis (STA) is used to determine the needs of conflicting parties who have 'stake' and interest in reforms. It is essential to have information about stakeholders' interests and willingness to support the solution, thus ensuring the adaptation of realistic and sustainable policies [12]. In the STA part, stakeholders' matrix, engagement towards conflict, and responses to the conflict were used as tools to understand their positions, their relationships with other groups, and their desire to find suitable solutions. In the last section, win-win solutions were developed based on the analysis of the conflict and of stakeholders, which helps in identifying possible negotiable strategies with the conflicting stakeholders.

THE STUDY AREA

The Oslo Agreement divided the occupied Palestinian territory (oPt) into three political Areas (A, B and C) which designate varying levels of control [13]. Area A comprised 1,004 km² (20 %) of the West Bank, Area B comprised 1,204 km² (21 %) of the West Bank, while Area C constituted 3453 km² (59%) of the West Bank. The inhabitants of the West Bank is 2.6 million people in the area of 5,661 km² [14,15]. The West Bank has a very high growth rate, about 2.6%, and is distributed as follows: 68.81% in urban districts, 25.79% in rural districts and the remaining 5.40% in refugee camps [16].

The West Bank population generates 44.8 million cubic meter per year of wastewater, which implies an amount of supplied water of 55 liters per inhabitant per day [17]. Most of the generated wastewater in the West Bank is discharged untreated into the environment. The discharge of 70.25% of the public sewage networks runs untreated into open areas, while the effluent of 16% of the sewage networks is treated or pre-treated in wastewater treatment plants. The waste of the remaining 13.75% of the sewage networks is treated in Israeli treatment plants and reused for irrigation purposes [18]. This situation is aggravated by the impact of untreated wastewater that is disposed of the 257 Israeli settlements which are in the West Bank region affecting the neighbouring Palestinian villages and agricultural land [19]. The main wastewater stream flow is in Wadi Zeimar, Wadi el-Sajour (Nablus), Wadi Beitunia (Ramallah), Wadi en-Nar (Bethlehem) and Wadi as-Samen (Hebron) [20]. Figure 1 shows the transboundary area between Israel and Palestine.

The Joint Water Committee (JWC) was formed according to Article 40 of the Oslo Agreement, and the parties agreed on the agenda and mechanism of the committee. Despite this agreement, the Palestinian side claims that during the previous 15 years, Israel has agreed to only one Palestinian sanitation project (Nablus West) and refused more than 25 projects that are located in area C. Nevertheless; the Palestinians agreed to more than 30 sewage projects which service Israeli settlements in the West Bank [21].

According to official Israeli sources in 2007, Israeli colonies in the West Bank produce annually about 35 million cubic meters of sewage. 81 Israeli colonies out of 257 (according to Israel Interior Ministry's eyes there are 120 legal settlements and more than 100 settlements so-called "outposts") Colonies inside the West Bank have wastewater treatment plants. More than half of the existing treatment plants do not work and do not achieve the required standards. The director of the ministry's Central District, Gideon Mazor, admitted the failure of the ministry and the Supreme Planning Council in the Civil Administration to prevent construction or occupancy of buildings in settlements and industrial areas in the West Bank that do not have solutions for wastewater [20]. In a personal interview with Mr. Benny, Environment officer in the Israeli Civil Administration, who is responsible for all wastewater projects in the West Bank; Benny said that all the projects submitted by the Palestinian side to Civil Administration were approved and that all Israeli settlements in the West Bank have waste water treatment plants [22]. Settlements from the Israeli perspective considered as military zones and therefore; it is difficult to get any information about its infrastructure and residents. The assigned consultant for constructing a carrier line and regional wastewater project for Wadi Zomer catchment areas funded by the German Government, failed to get technical information about the settlements for design purposes due to Israeli side rejection [23].

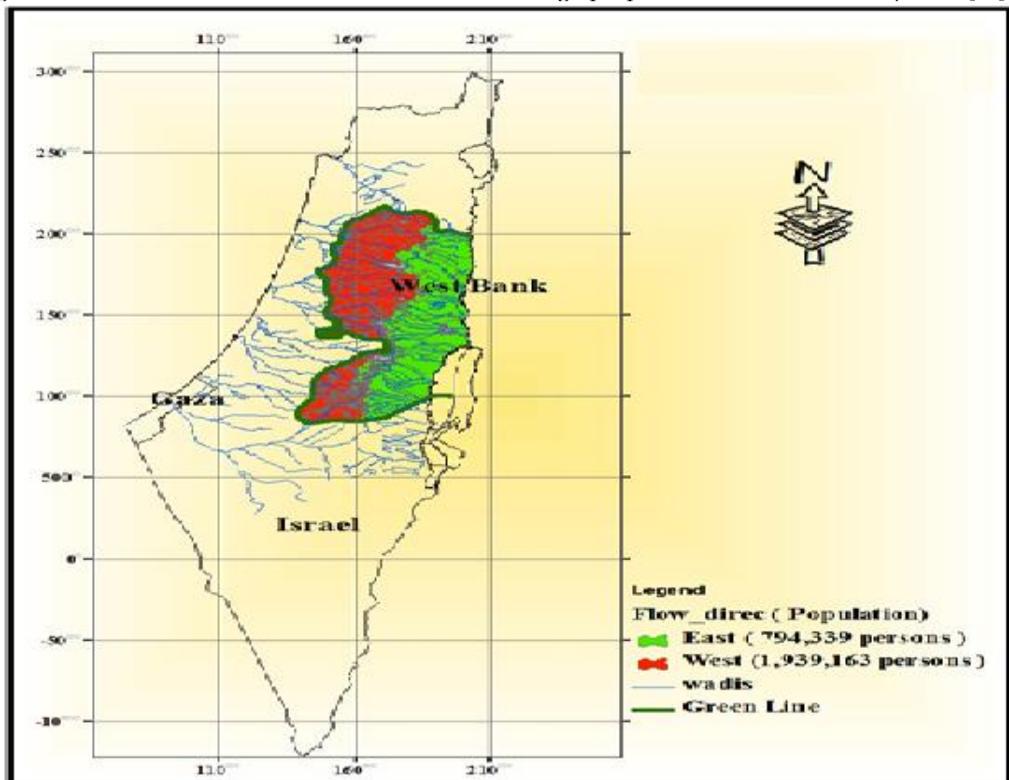


Figure 1 Green Line border, transboundary area

The transboundary pollution concern needs cooperation from both sides in order to solve the dispute [24]. In the Israeli-Palestinian case, the Israelis believe that the military force can achieve long-term cooperation and permanent environmental protection. JWC and Civil Administration granted all necessary construction permits for Salfit waste water treatment plant. However; the Israeli army stopped by force the construction and did not respect the permits issued by their own government. [25, 26].

Since 2003 Israel deducts the expenditures of transboundary wastewater treatment from Palestinian tax money that should be refunded to the Palestinian Ministry of Finance's national budget. It should be highlighted that Israeli treatment plants located along the Green Line are established or expanded from funds deducted from Palestinian tax money that is under Israeli control without any negotiating or agreement with the Palestinian side [20,25,27]. The international community has pledged \$500 million USD to build sanitation infrastructure in the Palestinian territories [28]. Israeli side refused to issue the necessary permits and continuously imposed an old/new requirement which links Israeli settlements inside the West Bank to Palestinian sanitation projects funded by the international community, which is considered illegal under international law. Israel demands high quality parameters of effluent that cannot be achieved unless complicated expensive technologies are applied, equivalent to the ones used in the US and Europe and which cannot be afforded by Palestinian targeted communities [29].

The lack of a clear mechanism in the Joint Water Committee (JWC) to give construction permits for sanitation projects in the West Bank has helped the Israeli side force its unfair water policy on the Palestinians [20,30]. This policy is not serving the purpose of future permanent and viable Palestinian state. Israelis are placing obstacles in the way of Palestinian sanitation projects, such as the imposition of high specifications, the connection of Israeli settlements, the requirement of zero treated effluent discharge during the winter, and the construction of wastewater carrier lines from the West Bank into Israel (Wadi Qana carrier line, Ariel carrier line).

Most Palestinians observe the JWC as a continuation of Israeli domination. These views are related to the veto power embedded in the Oslo B accords in the form of decision making by consensus: [All JWC agreements should be] reached by consensus, including the agenda, its procedures, and other matters (Article 40, paragraph 13; [31]). Since the water treaty was signed, Palestinians have continuously experienced the Israeli veto power on their wastewater development projects. Palestinians cannot veto the Israeli water and sanitation projects in the West Bank (Area C) or on a shared resource within Israel. The Palestinian Water Authority published a report where meetings of the JWC were described as "continuous suffering". The report also noted that even water and sanitation projects that were approved by the JWC were not implemented [21,32].

CONFLICT ANALYSES

The problem of transboundary pollution between Palestinians and Israelis has existed for more than 60 years and up to now no sustainable solution has been established. About 1.6 million Palestinians live in the west mountainous region in the West Bank within a watershed area, which has a topography where dry and seasonal valleys carry wastewater into Israel [33]. Other sources of pollution to the valleys come from the Israeli settlements in the West Bank. Recent data [34] indicated that almost 500,000 Israeli settlers live in the watershed area where raw wastewater is being discharged onto Palestinian lands and streams. This current wastewater disposal from both sides leads to the damage of farmland, contamination of water resources and poses public health hazards. Furthermore, while the Palestinian per capita water consumption is only 70 liters per day and the consumption of an Israeli settler is 296 liters per day as a result of Israel's control over water resources and higher living standards. [35].

The problem of transboundary sewage between Palestinians and Israelis goes back to the British mandate (1917-1948), Jordanian era (1948-1967), and the current Israeli occupation. The Israeli government did not provide any acceptable solution during the occupation period between 1967 and 1996, and have never tried to solve this matter. Since 1996 until now,

transboundary wastewater arouses conflicting issues between related parties that call for an urgent solution [36]. According to the Oslo Agreement, Figure 1 illustrates that the West Bank has an approximate total area of 5643 square kilometres classified into three areas of control: Area A, which represents about 20% of the West Bank is categorised by a lack of geographic connection. In addition, no flow of goods and materials is allowed except through Israeli checkpoints scattered all over the West Bank. Areas classified as "A" are of high population density; the development of this area is boarded and limited as they are surrounded by Israeli settlements and only inside these areas is there full Palestinian control.

Area B is subject to the Palestinians' civil control whereas security matters are under the control of Israelis. This category also represents about 20% of the West Bank; while the area classified as Area C represents 60% of the West Bank and is under Israeli control and represents the area of agricultural land with a low population. This category is the most important category because it is obviously the majority area of the West Bank and has a potential future for agricultural, economic and urban development. However, In order to have viable possibilities for wastewater treatment plant construction, the Palestinians must consider Area C for the establishment, the availability of agricultural land for treated wastewater re-use and distance from population centers. Such type of construction in Area C (i.e. wastewater treatment plants, or any other buildings and construction) must obtain the approval of 14 governmental and security parties on the Israeli side, which makes the process extremely difficult, and need a long time, meaning years [37-40].

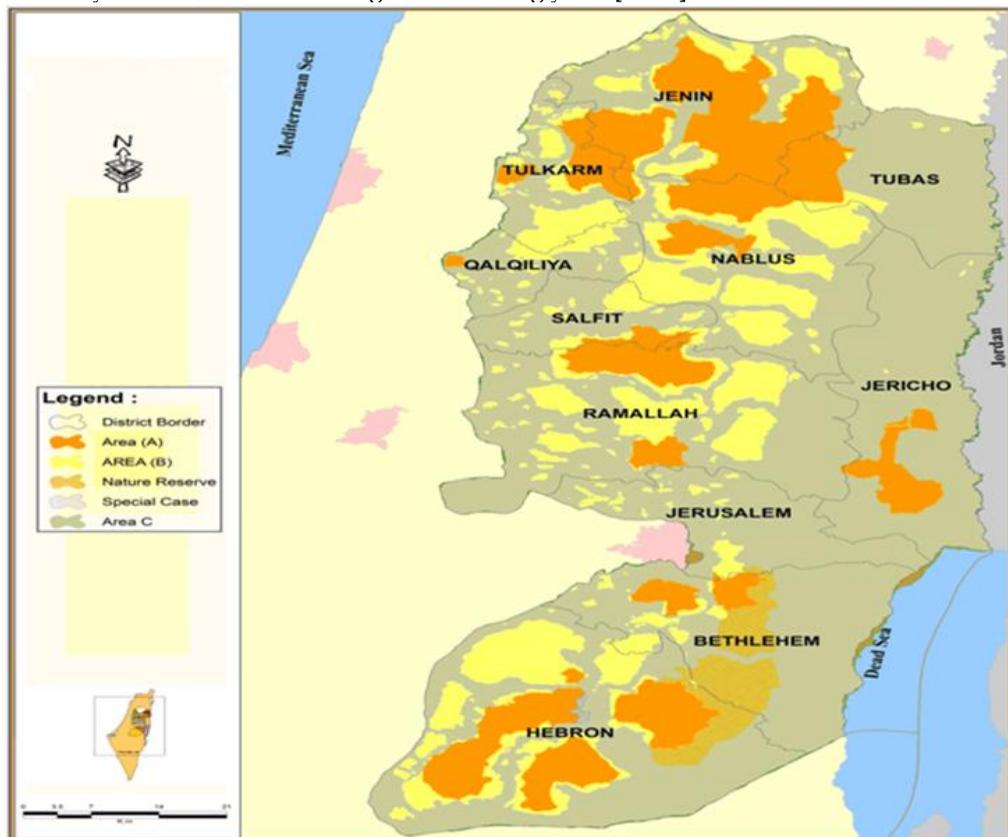


Figure 2: Oslo agreement geopolitical map for the West Bank (Palestine).

The conflict of transboundary wastewater was initiated between Israel and the Palestinians after the signing of the Oslo Agreement in 1996. Israelis started to claim that Palestinians need to resolve the pollution problem as soon as possible despite the fact that Israel did not consider solutions for these issues from 1967 to 1996. Regardless of these demands, Israel has hampered all Palestinian efforts to solve the problem ever since the 1996 Oslo Agreement. Below are some obstacles caused by Israel that prevented the implementation of wastewater projects:

- Israeli authorities through the JWC and the Civil Administration delayed and refused Palestinian requests for licenses and rejected several applications to erect wastewater treatment facilities to serve Palestinian communities [1996 until 2011].
- The Israelis withdrew their JWC and Civil Administration consent and approvals for some Palestinian water and sanitation projects such as sewage and drainage projects of Salfit in 1998 and Tulkarem in 2003.
- Israel imposed stringent standards that need huge capital investments and high annual operation, maintenance and repair costs. Citizens have no affordability to pay for treatment costs.
- Israel water law (effluent reuse) prohibits [32, 41] the discharge of treated wastewater into seasonal valleys despite complying with required effluent quality standards. As a result, this calls for the construction of mega storage reservoirs, especially during the winter period, where no effluent reuse in irrigation can be practiced. Huge financial burdens and loss of valuable land are associated with such a rule, and thus cannot be implemented.

Because of the conditions listed above, none of the funded and proposed wastewater projects is being implemented, resulting in the wastewater flowing into valleys and across the border into Israel. Wastewater flows from the Palestine side through the border is around 20 million cubic meters annually [11]. On the other hand, wastewater flows from the Israeli settlements inside West Bank is 54 million cubic meters per year that is dumped into the environment within the West Bank [42].

The four involved parties in this conflict are Israel, Palestine, donor countries and NGOs, both local and foreign. There are varying roles and relationships of these parties regarding the problem of pollution. Israel has political and military power, economic and technical resources, and control over all aspects of life in the West Bank. In addition to controlling Palestinian day to day life, Israel as the main and stronger player in this conflict put political pressure on the donor countries to follow its own agenda. On the other hand, Israel has to handle the tense relationship with the civil societies because of local and international criticism of Israeli policy towards the Palestinian. Another aspect of this conflict is the relationship with the Palestinians. Palestine has no military and economic power and lacks sovereignty on its own resources as guaranteed by international laws. Palestinians should always seek Israeli approvals despite the concessions they made in the Joint Water Committee. The concessions entailed approval to erect more than 30 sewage projects within the Israeli settlements in the West Bank, as well as construction of a sewage main trunk line from Israeli settlements into Israel [according to JWC minutes of meetings]. (It is worth knowing that the peace process has been stalled due to the construction of Israeli settlements that oppose international law and challenges the Palestinian leadership.) The relationship between donor countries and Palestinians is in a good manner., Also relations with NGOs are good because these are defending environmental rights based on international law. Figure 3 shows the conflict map which explains the relation between the involved parties.

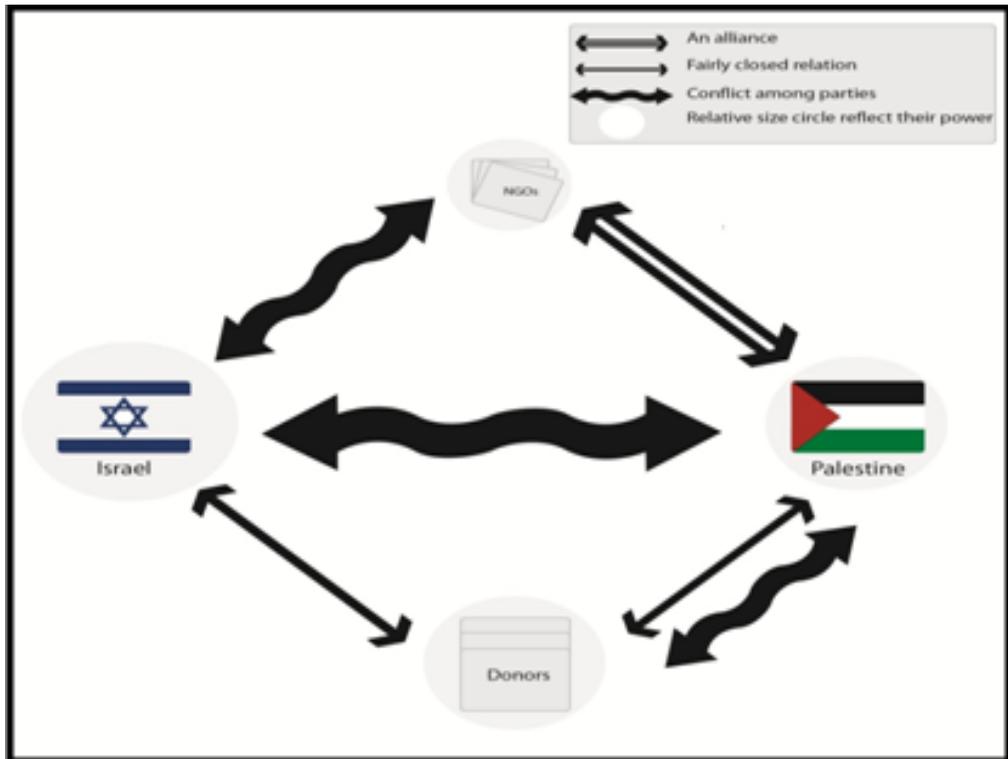


Figure 3 Conflict Map

RESPONSE TO THE CONFLICT

Parties have various responses to the conflict. The Israeli response to the conflict is affected by its military and economic power so it is trying to impose conditions on the weaker party [the Palestinians]. Israel truncates 1,000,000 US dollars every month from Palestinian tax money without mutual agreements and neglects joint agreements and international law. Israel has also used army forces to stop the establishment of Palestinian wastewater treatment plants, despite the approval of such sanitation projects by the Joint Water Committee. The Palestinian position in the conflict is mellow due to its non-existent military and weak economy. However, the Palestinians work on clarifying their position and ask donor countries and NGOs for justice. Palestinians try to mobilize the international community to place pressure on the Israeli government to solve the transboundary problem based on international law. Israel must cooperate to protect shared water resources and the environment from pollution, thus achieving environmental justice towards. Figure 4 shows the role of power and interest in the stakeholders' engagements. The role of the donor countries is reflected in their understanding of the conflict and in trying to use their political and economic power to fund wastewater projects and to coordinate joint meetings between the two parties to discuss the problem and find the best solution. The power of local and international NGOs regarding the conflict is grounded from international environmental law and technical aspects. The NGOs act as catalysts by understanding the conflict and the position of each party. NGOs development projects in water and sanitation infrastructure advances communities and protects the

environment and water sources from contamination, table 1 shows the conflict analysis.

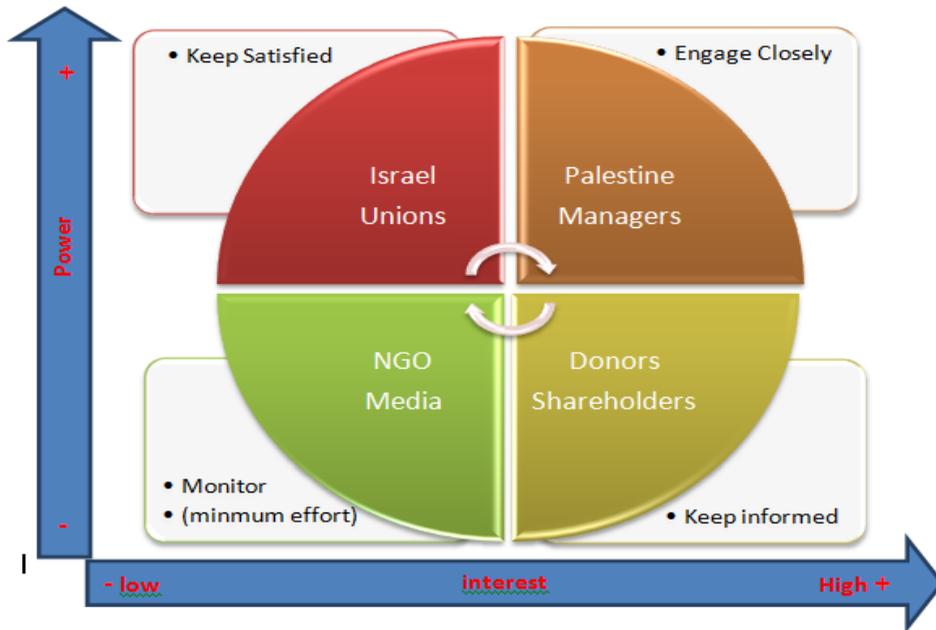


Figure 4 Engagement towards stakeholders

Table 1. Stakeholder’s matrix

Stakeholder	Role	What’s at stake	Threat/ Cooperation Potential*	Response to the conflict	Engagement Toward party?	Relation to other stakeholders
Israel	Downstream	Political interest	H. T& L. C	Suppression	H. Power L. interest	Dormant
Palestine	Upstream	Rights & Ownership	L.T& H.C	Management and promotion	L. Power H. Interest	Dependent
NGO*	support	interest	H. cooperation	Acceptance	M. interest	Discretionary
Donors**	support	Interest	H. cooperation	Acceptance	M. interest	Discretionary

- H: High, L: Low, M: Medium, P: Potential, T: Threat, C: Cooperation
- Acceptance: Recognize a conflict, but accept whatever solution emerges or is imposed.
- Management: Acknowledge a dispute, and act to control its impact
- Promotion: Parties with a serious grievance and little power may feel they need to agitate to get their problem heard.
- Suppression: Powerful parties may use their influence to deny a problem and prevent a grievance from surfacing.

* Non Governmental Organizations (NGO) (The main international NGOs: Friends of Earth, Oxfam, Care, Anera, B’TSELEM,.....etc).

** Donors-Funding agencies (The main wastewater projects donors in Palestine: Germany-KFW, US-USAID, France-AFD, EU, Japan-JICA, ..., etc).

CONFLICT MANAGEMENT AND RESOLUTION

Conflict management and resolution are tools that can be used to induce the parties to open up and be aware of each other’s interests and positions in the conflict itself.

Management mechanisms can reduce potential conflicts by considering different perspectives and interests to establish new management options and win-win solutions. A negotiation plan consists of three stages:

- The first stage is called as fact finding stage and constitute mainly of data collection for the purpose of understanding the reality of the conflict. This stage is conducted by research centers and NGOs that are considered neutral in describing the reality.

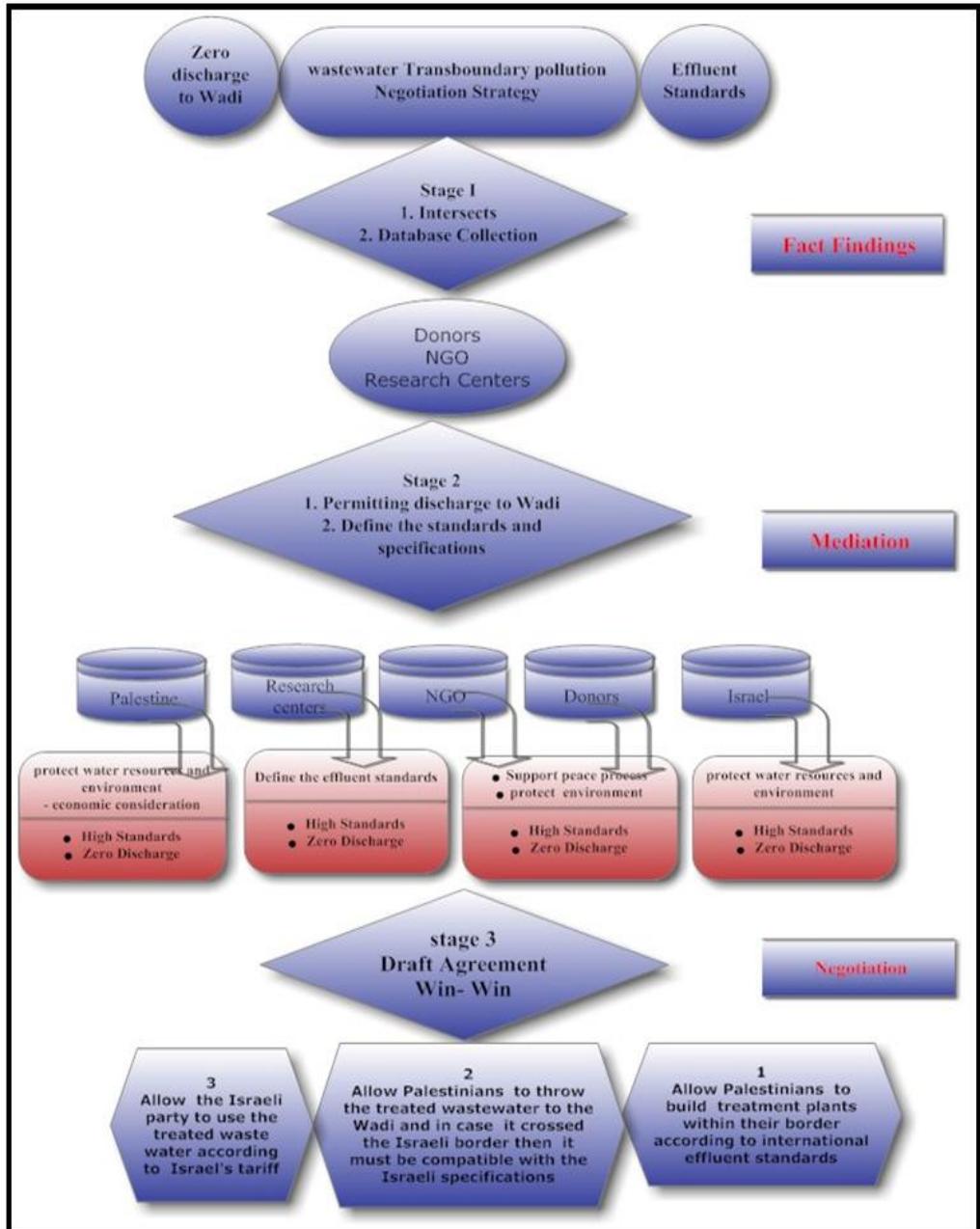


Figure 5 Negotiation strategic map

- The second stage is called the mediation stage. This stage is characterized by identifying the requirements and conditions of all the involved parties in order to facilitate the development of solutions in the negotiation scenarios. Israeli side calls for environmental protection through imposing high specifications and standards on the Palestinian side. On the other hand, the Palestinian side supports the protection of the environment, but within the acceptable international specifications and standards that match the Palestinian economic capacity. Whereas the donor countries, NGO and research centers working in the region are seeking to push the peace process and protect the environment from pollution.
- The third stage is the negotiation stage that is intended to meet the requirements of all parties; which allows the Palestinian side to build wastewater treatment plants within the borders of the West Bank and verify the degree of processing within the international standards. But in case the treated wastewater crosses the Israeli border, then it must be within the Israeli specifications. Figure (5) below shows the negotiation map which is one of the resolution tools.

CONCLUSIONS AND RECOMMENDATIONS

The conflict between Israel and Palestine on management of transboundary wastewater is in fact, not just a conflict about polluted runoff, but it is an unbalanced fight over water sources, because wastewater is a key component of integrated water management. Treated wastewater can be considered as a water resource that can preserve and expand the available water resources, and provide unconventional resource to meet diverse water needs, while also providing protection of aquatic ecosystems. If these achievements are conducted, it will then reduce the dependency on freshwater, reduce the need for water control structures (dams and reservoirs), and maintain a healthy ecosystem via improved water and wastewater management.

The conflict analysis between Israel and Palestine regarding trans boundary pollution should not be limited to the "polluter pays" principle, which is based on pollution eliminating costs, because wastewater is a source and has economic, social and environmental benefits after treatment. Future negotiations that aim at resolving the trans boundary wastewater conflict should consider the actual economic, environmental and social impacts caused by pollution. The compensation price for the water pollution source should take into account the economic benefits of treated effluent reuse/no-use and long-term benefits such as the entry of this source in the water balance of the ecosystem.

In the environmental conflict, Israel is the stronger side in terms of land and natural resources control; thus it can impose its own terms on the Palestinians. If Israeli's water law aims at protecting the environment from pollution caused by Palestinian trans boundary wastewater, then Israel should cooperate with donor countries and NGOs to find the best solutions to solve the problem depending on a cooperation principle. If it agrees that the conflict is an environmental struggle rather than political conflict, the donor countries have pledged to provide any needed funds to solve the problem, and the civil institutions are willing to provide technical support for the Palestinian party. The two parties, Israel and Palestine, should cooperate by granting the necessary construction permits for sewage projects, and to revise the high design standards. Cooperation between Israel and Palestine will guarantee sustainable operation of sewage infrastructures. Stringent by-laws and complying with environmental standards will provide a guarantee

for environmental justice and fair implementation.

The Palestinian side is the weaker party in the conflict and has the responsibility to prevent wastewater pollution resulting in its regions, after the stronger party provides appropriate conditions. The stronger party shall remove technical and military obstacles, using the principle of cooperation and stop the principle of unilateral actions. The weaker side should build an effective, efficient sanitation institutional system in order to build trust and cooperation with the stronger side. The Palestinian side should invest in research to develop the sanitation sector and try to get best technical specifications that are compatible with the Palestinian environment.

Trans boundary wastewater conflict consists of three technical challenges. (1) Israelis impose high design criteria and effluent quality standards upon Palestinians for the establishment of sanitation facilities, in areas that do not commensurate with technical and economic potentials. (2) Israelis impose restrictions upon Palestinians which prevent the discharge of treated effluent into the seasonal valleys, which means an increase in the capital and running costs of sewage systems to build reuse systems on the Palestinians. (3) The definition of high sensitivity areas for pollution, because this element can lead to relocation of proposed wastewater treatment plants in other less sensitive zones.

Donor countries and NGOs have a responsibility to foster the convergence of views between the opposing parties. Allocating funds for the establishment of wastewater treatment facilities in the West Bank leads to stem the flow of pollution into Israel and helps advance treated water as an additional water resource. The NGO and donors parties also aid in establishing the principle of cooperation between the two sides for the purpose of making them equal parties in the technical capabilities and infrastructure.

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