Gender Empowerment and Treated Wastewater Reuse in Ein Qinia Village, Ramallah - Palestine

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Abstract

The gender empowerment of communities and individuals in Ein Qinia village / Ramallah on the acceptance of wastewater treatment projects and treated wastewater reuse was studied. The gender acceptance was determined through whether or not trained focused women groups in treated wastewater reuse could be increased in reusing the treated wastewater in agricultural activities. Women showed a high acceptance of reusing treated wastewater for agricultural purposes after the gender awareness dialogue and training which was provided. The outcomes strengthening the importance of creating knowledge towards sustainable wastewater reuse in pre-urban areas is a strategic need for the Palestinian decision makers. A comparative study for Ramoun treated wastewater in Ramallah was carried out, showing a good empowerment image on a smaller scale than in Ein Qinia village for the acceptance of treated wastewater reuse in agriculture. It reveals that the baseline data of women's empowerment in treated wastewater reuse is identified as a critical need to create a more gender-sensitive approach for treated wastewater projects.

Key Words: Gender empowerment, treated wastewater reuse, Palestine, West Bank.

Introduction and Literature Review

In Palestine, women are disproportionately affected by lack of access to sanitation and adequate quantities of safe water. The different positions of women and men are influenced by historical, religious, economic and cultural realities. It has become increasingly accepted that women should play a role in water management, which could be enhanced through the strategy of gender mainstreaming. The importance of involving both women and men in the water and sanitation management has been recognized at the global level. Sanitation is one of the major challenges faced in overcoming gender inequalities, which requires a fair share of water benefits and responsibilities to be transmitted to men and women (Katsi, 2008 and World Bank, 2002).

The lack of water quantity and quality encourages of the use of non-conventional water resources, such as treated urban wastewater. Wastewater reuse is especially important in urban and pre-urban areas which a characteristic agricultural landscape is replaced by an anonymous built environment (Jackson, 1997). A number of approaches are possible for improving social involvement in waste water reuse projects, such as the empowerment of communities and individuals, particularly women depending on their roles. More attention should be given for the women involvement in the design and management of reuse of treated wastewater in Palestinian communities' treatment and reuse projects (Arafa et.al, 2007). This could be by increasing awareness among the women as well as men regarding the wastewater reuse, which is considered as strategic needs that can raise their empowerment indictors as it affects women roles for the acceptance of reusing treated wastewater (Bader & Ghanem 2013). The recent research aimed to improve the empowerment of communities and individuals (mainly women) in the Palestinian pre-urban areas on the acceptance of wastewater treatment projects and the reuse of treated wastewater as well as to investigate the

impact of conducting women training and awareness in increasing their acceptance on reusing the treated wastewater.

Few studies were conducted about the connection between Gender, water and treated wastewater in Palestine. Water Quality as Indicator of Gender Equity in Palestinian Rural areas in Tulkarem District was studied by Bader (2014). Women's triple roles in rural areas are gender-based and subject to social norms. Urban agriculture and eco-sanitation to study the strategic potential toward poverty alleviation in the Gaza Strip was studied by Al - Najar (2007). The Integrated Sanitation Project in the Artas Valley incorporates a combination of sanitation concepts and techniques. The project demonstrated an affordable rural sanitation alternative for densely populated mountain communities where sanitation is not feasible (Gert de Bruijne, 2000). The GIZ-supported a baseline study (2011) to assess gender-related challenges in the Water Sector in Palestine, revealed as a main finding that women are underrepresented in the sector and their needs, priorities and capabilities are not given sufficient attention by decision makers. Based on this situation analysis to assess gender-related challenges in the Water Sector in Palestine, the development of a national gender strategy for the environmental sector with focus on water and solid waste was recommended to support the closure of the gender gap in the sector.

Lack of women's participation in decision-making relating to water and sanitation can mean that their voices are not heard and their needs are not prioritized. Almost two million people live without sanitation services in Palestine (PWA, 2012). Only 32% of Palestinians in the West Bank are connected to sanitation networks, while the rest use cesspits or septic tanks. There is a lack of wastewater projects in Palestine due to the Israeli Policy restrictions and there are no new WWTP permissions without any link to the nearby settlements as well as their rehabilitations. All parts of building, installing and operation of the WWTP need permission from Israelis as well as any reuse in the surrounding environments. Additionally,

sites selection of the WWTP need permission from the Israelis, which may take years of importing any part of the WWTP for rehabilitation processes as a result to the Israeli policy. The Palestinian - Israeli water committee is responsible for any wastewater project in Palestine. Out of 303 submitted projects in the year 2012, only three projects were permitted. The Israeli reaction in all Palestinian water and wastewater projects act as an occupational policy in hindering the human rights and destroying the environment. Agricultural work occupies a significant interest in the reality of the Palestinian developmental experiences, especially for the women's sociality and national development Strategy. Women's empowerment can be defined as the process through which an individual woman becomes conscious, gains self confidence and the ability to address inequality between women and men. Empowerment is more recognition of the concepts of women as an actor in the economic, social and environmental developments. Economic empowerment means the emergence of women's economic participation issue which begins on a global regional and local level and the inability of the community to support the advancement and development of women's participation demonstrating the anti-poverty. Solomon, (2004) studied the role of humanitarian associations enable women to share important life indicates the strong relationship between the role of the women's empowerment work and their women's work in societies. A study titled *Draft boom women development and its relationship to enable women of Jordan* (Malkawi, 2003) led to increased participation women confidence in capacity building decisions by their families in various areas.

Methodology

The methodology includes the qualitative techniques such as field observations & focusing groups and quantitative methodologies such as a questionnaire survey. The study area is Ein Qinia, located to the north west of Ramallah (Figure 1) of 1200 inhabitants (PCPS, 2015). It

is considered as the nearest village to Ramallah city and served by water network in 2010 as the last community in the whole district, due to Israeli occupational permit policy. This village is located very close to an Israeli settlement Dolev; Israelis restrict development of the village for the reason of their extension from the western side. Most of the families depend on agriculture, they irrigate their lands based on seven spring yields existing in the village. Currently, locals depends on four types of water supply to fulfill their basic needs: Water network, Rain water harvesting (RWH), conveying water by buckets from springs, and purchasing water tankers –particularly in summer. Locals, who are facing water shortage in summer times cannot afford the high price of water supplied by water tankers. In 2010, a wastewater treatment plant (WWTP) was built in Ein Qinia wadi, serving 22 kilometer sewage network for Al Tireh neighborhood, western Ramallah. The WWTP was operated in December 2013 and has a treating capacity of two thousand cubic meters per day, and without the need for pumping stations (Ramallah Municipality, 2014). The outlet of the WWTP affects the springs' water quality in Ein Qinia village. The treated wastewater flows for a path of five kilometers, three of them are located inside the lands of Ein Qinia village. The treated wastewater is used for the irrigation from the villagers. The irrigated crops are trees, vegetables and orchids. The nearby springs were polluted before the operation of the WWTP for the reason of evacuating the wastewater tankers their wastes into the Wadi, which infiltrates to the springs' reservoirs in the area. Some of the springs' are polluting from the wastewater of the nearby settlement Dolev, causing the immigration of the farmers from their lands.

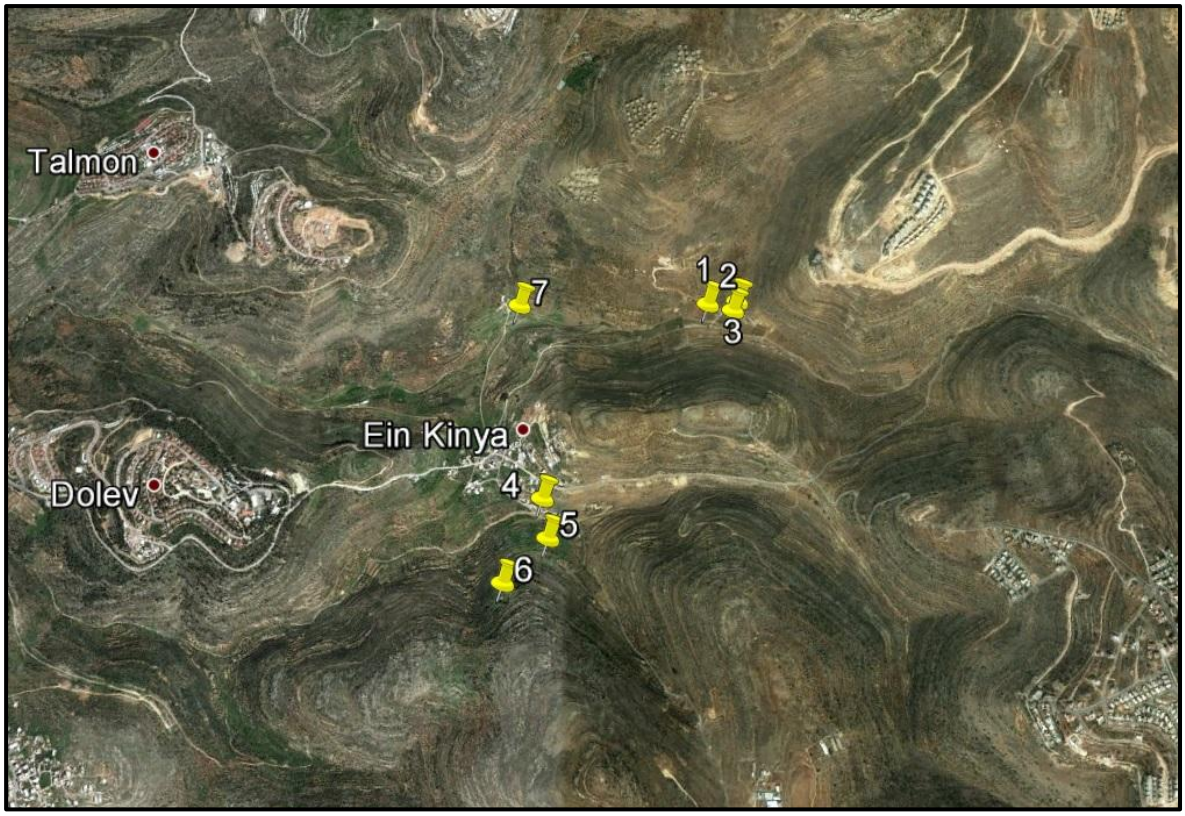

Figure 1: The location map of the study area, where the springs are located

Fieldtrips observations

Many field trips were conducted to the study area along the Wadi path near Ein Qinia and monitoring the whole path faced obstacles of no free movement along the Wadi because of the nearby Settlement Dolev in the village lands. Settlers prevented the farmers in reclamation their lands located nearby the settlement zone. The observations focused on the faunae and flora species, physical characteristics of the treated wastewater stream and human and social environments in the area.

Focused Women Groups and Interviews

Focusing women group with local communities, experts and beneficiaries were conducted, consisting of twenty five persons including 10 women. The main issue was to sustain dialogue about waste water treatment projects and reuse between the researchers and local

communities. Full understanding of the existing problems with respect to wastewater treatment for small communities will help in raising awareness for the local community in reusing the treated wastewater for agricultural purposes. Women`s empowerment in agriculture was analyzed using **Alkire methodology** that illustrates domains of women empowerment: production, decision making power over productive resources, control over use of income, leadership in the community and) time usage (Alkire and Vaz, 2012). Many interviews with women in homes, land agricultural fields and through the focusing gender groups were taken place in Ein Qinia village. The major questions were about gender empowerment in reusing the treated wastewater nearby the village for irrigating their lands for agricultural purposes and land cultivation. The majority of them changed their idea after they gained knowledge about the wastewater reuse if it has a good quality.

Questionnaire Analyses

Questionnaire including gender - treated wastewater and the reuse acceptance of the treated wastewater was designed. A roughly selected sample of 30 farmers from Ein Qinia inhabitants was interviewed. It focused on the following main issues women and community empowerment index, social acceptance - awareness impact on acceptance of treated wastewater and Empowerment impact on acceptance of treated wastewater reuse. The data collected by survey were analyzed using SPSS (Statistical Package for Social Science) program for windows- Release 18.0.0, SPSS® Inc. (2009).

Findings

Human Environmental Interactions

Human social systems and ecosystems are complex adaptive systems (Marten, 2001), which means socially that people have to modify their social behaviors according their surrounded environment. Bedouins in Ein Qinia are living around the treated wastewater wadi and they are dependent on grazing because they don't have land properties. They use the treated wastewater as domestic water resource for their daily consumption, because of the existing poor infrastructure (no electricity, no water network...etc.). After many interviews with the Bedouins, they agreed to rent lands from the locals in Ein Qinia for agricultural activities using the treated wastewater source. On the other hand, rural people who lived in the village, who had better infrastructure including electricity and water network, are dependent on farming their lands located near the water stream. This interaction reflected the correspondence between the social - environmental context which was best described by demographic transition and cultural ecology theory (Moran, 2010).

Dialogue about waste water treatment and reuse

The participatory techniques through focusing group revealed that significant environmental improvements have been achieved through wastewater treatment, including water resources protection and the potentiality to address agriculture irrigated by treated wastewater. The treatment projects have been of less successful in their goal of increasing agricultural water resources and protecting spring water. However, after the dialogue other aspects of community development were addressed in increasing the agricultural lands using the treated wastewater for irrigation. It was noted that training and raising awareness for local communities play an important role in increasing the reclamation of lands in the areas if the

irrigation source is available. The focused gender groups acquired knowledge on waste water treatment projects in addition to the importance rural agriculture in regards to their limited information before the dialogue. More knowledge was added to the health risks of wastewater and awareness of their appropriate roles for all actors in the wastewater treatment and integrated water resources management sector.

Questionnaire Analyses

Women Empowerment

Results show that in 50% of the respondents, only one of the females from the family members were engaged in farming, this would usually be the mother, this reflects the empowerment. Respondents confirmed that decision making related to agricultural production are made by the male while only in 40% of the cases is the female involved. Those results reflected that females were not considered as active members to participate in production process, and so they were disempowered in production domain. After the focused group dialogue they were aware of involving more in agriculture, which will help in increasing their decision making role.

A total of 60% of the sample cultivate privately owned land, while 30% work on land that is rented. The results indicated that expenditures, notably input costs impact the decisions made by the respondents in terms of production including the type of crops grown. The land property and decision making were dominated by men. The results illustrated that the male in the household, being either the husband or the father, make the decision on how income is spent (64%), while only 16% of the sample report that decisions are made together, this situation does not improve women empowerment. Moreover, the majority of the respondents (66.7%) were not employed, indicating that most were in fact housewives which are

dependent on their spouses for their income. The vast majority of the respondents were not members of any type of organizations or groups such as farmers' associations, etc. Surprisingly, 67% of the sample do not participate and/or are not interested in participating in elections but when talking about leisure time; almost 63% of the sample believe that they have enough time to rest which means that women are empowered in term of time domain, although those indictors said that women were disempowered especially that the education level achieved by the respondents. The overall sample was approximately spilt into thirds ranging between primary (0 - 6 years of schooling), secondary (7 - 12 years of schooling) and undergraduate/university degrees (Figure 2). While the distribution of the respondents across age categories varies indicates that the majority of the respondents are younger than 31 (42.9%). This reflects the less empowerment for young uneducated women according to Alkire argument (Alkire and Vaz, 2012).

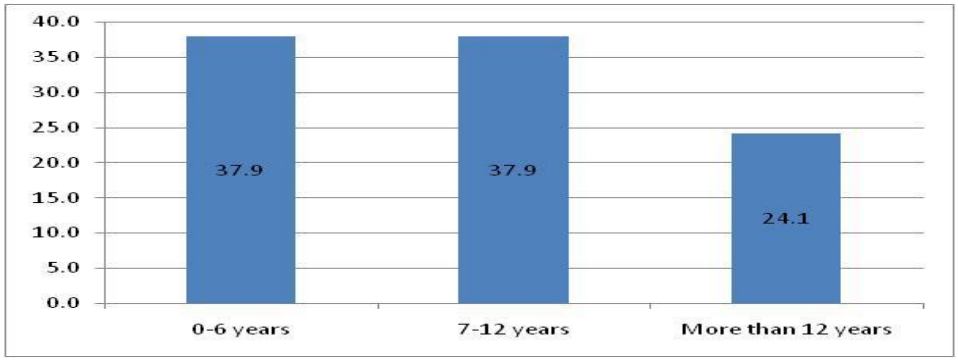

Figure 2: Education levels for the sample population

Acceptance of treated wastewater reuse

The majority agreed to reuse treated wastewater for different purposes. Those who refused to reuse treated wastewater are due to psychological reasons and health concerns. Although, the vast majority of the respondents believed that treated wastewater can contribute to the solution but will not have a significant impact on water shortage issues, but will positively

impact the environment. This indicates that women had the desire to reuse water but most of the sample (61%) did not have any background information on wastewater treatment plants. It was noted that there a change in mind after the conducted dialogue.

Awareness toward treated waste water reuse

Most of the respondents had never participated in any training courses/workshops on wastewater treatment and reuse, 50% of them were involved in events at least twice. At the same time, respondents believed that experts/specialists would be the most capable of influencing peoples' willingness to reuse treated wastewater (Figure 3). All confirmed there is a necessity for awareness raising activities.

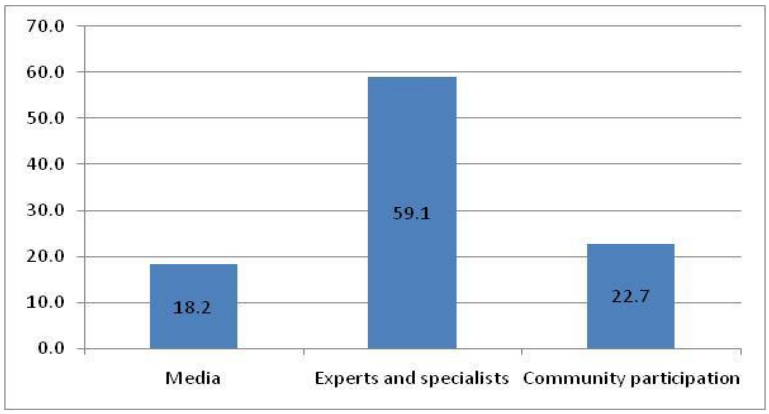

Figure 3: Most influential groups on willingness to reuse treated wastewater

The impact of women empowerment toward the acceptance of treated wastewater

Most of the respondents were confident in their ability to convince their spouses to reuse wastewater, this trend relates to empowerment in terms of leadership. One-third of the respondents that reported being prevented claim that it was due to their gender, one-third refer it to their social position while the rest think that it was because of their economic situation or political affiliation. Two-thirds of the respondents believe that there is an ability to change despite it being difficult. This emphasizes the importance in gender empowerment

in communal decision making. After a conducted dialogue the acceptance of reusing of treated wastewater is increased (Table 1). The majority of the respondents believe financial savings can be made from treated wastewater reuse flowing in the wadi.

Table 1: Acceptability to reuse treated wastewater for specific purposes

Purpose	**Yes**	**Don't know**
Use of treated wastewater for cleaning purposes	65.5	3.4
Use of treated wastewater for toilet flushing	62.1	10.3
Use of treated wastewater for fire extinguishing	75.9	17.2
Use of treated wastewater for decorating plants	89.7	
Use of treated wastewater for fodder	75.9	
Use of treated wastewater for vegetables eaten raw	34.5	3.4
Use of treated wastewater for vegetables eaten cooked	51.7	
Use of treated wastewater for fruit-bearing trees	62.1	3.4
Use of treated wastewater for industrial purposes - stone	60.7	35.7
Use of treated wastewater for drinking purposes	6.9	3.4

Comparison case study

A comparative study was carried out in Ramoun Treated wastewater in the eastern side of Ramallah of 3360 inhabitants (PCPS, 2015). The study targeted the empowerment of women inside the village from socio-economical - environmental point of views. This will ease the possibility of the usage of the treated wastewater from the village inhabitants, especially women and from the locations which lies down stream of the Waste Water Treatment Plant (WWTP). The farmers are using the wastewater in medium scale in the village and it was noted the treated waste water quality is good. A questionnaire was distributed to random samples of 40 females. 58% of the study sample agreed that the wastewater is necessary to preserve the environment treatment, while 42% do not agree that it is necessary and this percentage indicates a good awareness about the importance of wastewater to the women of

the village address. The acceptance of individuals to use treated wastewater for irrigation, show that only 35% agree, 15% disagree, and 50% are not sure of the extent of their acceptance of the idea. The comparison study revealed that women in Ramoun area are less empowered than the women in Ein Qinia. This is due to the lesser interest of agricultural activities in Ramoun area than in Ein Qinia according to economical situation. The people in Ramoun area are wealthier than in Ein Qinia as the majority of them reside and obtain jobs in the USA which reflects their carelessness for agricultural development on their existing lands.

Conclusion

Due to the lack of information about the Gender and treated wastewater nexus in Palestine, gender empowerment indicators in reusing of treated wastewater in Ein Qinia were investigated. The focused gender group gained knowledge in social roles added more to the productive agricultural mainstreaming and gaining self confidence enriching the concept of women society empowerment. The study uses the qualitative and qualitative techniques such as field observations, focusing groups, interviews and a questionnaire survey. Women interviews added positive value to the women empowerment in reusing wastewater and decision making in communal and family levels. Bedouins living in the area accepted of intensifying their treated wastewater reuse planting small farms after the awareness dialogue. Community development aspects were addressed after focusing women dialogue in increasing the agricultural land areas using the treated wastewater for irrigation as a result of raising their awareness. Results reflected that females were disempowered as active members to participate in production agricultural process, became active and empowered after the focusing women dialogue in terms of leadership. A comparative study of the women empowerment in reusing of treated wastewater is carried out in Ramoon village

indicates that there is a strong need for the awareness campaigns for the locals. Females in Ramoun village show positive images of the acceptance of wastewater reuse idea, but lesser than in Ein Qinia village. After conducting focused gender group in Ramoun village, the percentage of reusing wastewater for agriculture has increased and the role of women in society has to be increased. The comparison study revealed that women in Ramoun village are of less empowerment than those of Ein Qinia village, due to the lesser interest of agricultural activities in Ramoun area than in Ein Qinia according to their better economical situation.

Policy Recommendations

The study deals with Gender empowerment in Ein Qinia village which surrounded on the western side of the Israeli settlement Dolev, which was built on the lands of the village and the surrounding villages. The farming activities in the village are controlled by the Israeli military camps near the village and three military check points were present around the village before 2010. Increasing the agricultural activities in the western side of the village using treated wastewater will be prevented by the settlers. The conducted women empowerment awareness will be affected by the Israeli policy, thus the occupation has negatively affected women empowerment. It is recommended to conduct similar gender empowerment studies in other WWTP in the West Bank, especially those having the wastewater of the settlement to determine the gender empowerment indicators which act negatively and are a direct affect of the Israeli occupation. It is also recommended to include gender empowerment in the Palestinian strategy water and wastewater projects as well as to create gender associations in the communities in order to encourage women taking part in decision making policy.

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