

Stakeholder analysis for supporting local water security planning in the Kingdom of Jordan

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Abstract: Stakeholder analysis (SA) represents a precondition for setting up an effective stakeholder participation in water management since it helps to better understand stakeholders' role and actions, identify whose stake should be taken into account, reveals power relations among stakeholders, helps to understand the diverse range of potentially conflicting interests, analyze driving forces and existing coordination among stakeholders, and identify bottlenecks in communication which affect daily operations or strategic planning for the future way forward. This paper presents the results of a SA performed in the Kingdom of Jordan for water management sector with the purpose of assessing stakeholders' capacity to participate in water management planning process based on following attributes: power, interest, knowledge, attitude, legitimacy, attention getting capacity and existing and desired level of involvement. Statistical correlation of stakeholders' knowledge about water management issues and power in water management sector with other attributes was investigated as well. This was designed to determine the importance of stakeholders' level of knowledge and power relevant for success of water management process.

Key words: Water management, stakeholders analysis, participatory planning

1. INTRODUCTION

Management of natural resources in general and water resources in particular, until recently, have largely been developed and implemented by experts using technical means based on designing systems that can be predicted and controlled under the auspices of the state (Pahl-Wostl et al., 2007). However management process is complex, multi-scale and affects different recourse users such as individuals, groups and organizations. Thus, nowadays stakeholder participation has gained increasing importance and is considered to be one of the crucial preconditions for sustainable and legitimate natural resources governance and management.

Supporters of participatory management argued that involving stakeholders results in greater quality and durability of decisions (Beierle, 2002; Reed, 2008). It contributes to improvement of project design by using local knowledge, better understanding of projects and issues, integration of various interests and opinions and public acceptance of the decisions (Luyet, 2012). What is more, it secures a sense of ownership over the process and outcomes, creates a transparent decision-making process which is flexible to changing circumstances and promotes equity, trust and respect among stakeholders and the administration (Reed, 2008, Webler et al., 2001). Stakeholders' participation has been applied in different sectors such as forestry, rural development, protected areas, biodiversity, but it turned out that participation is most highly visible in water management (Laušević et al., 2015). In order to secure effective stakeholder participation, stakeholder analysis (SA) is a necessary step. According to Schmeer (1999) SA is a process of systematically gathering and analyzing qualitative information for determining whose interests should be taken into account when developing and/or implementing a policy or a program.

In policy research, SA has been seen as a way of generating information on the relevant actors to understand their behavior, interests, agendas, and influence on decision-making processes (Brugha

and Varvasovsky, 2000; Reed, 2009). SA is a valuable tool which identifies bottlenecks in communication which affects daily operations or strategic planning for the future way forward (Luyet, 2012), reveals power relations with a reference to past or existing decision-making processes (Evans, 2009; Heidrich et al., 2009) and helps to understand the diverse range of potentially conflicting stakeholders' interests (Prell et al., 2007). One of the main motivations for conducting SA is its expected aid for participatory processes (Mushove and Vogel, 2005). Although this is a vital first step in any participatory exercise, stakeholders are often identified and selected on an ad hoc basis. This has the potential to marginalize important groups, bias results and jeopardize long-term viability and support for the process (Reed, 2009). Another consequence of unidentified stakeholders is the possibility for them to appear later and have negative impacts on the project. On the other hand, involving all possible stakeholders may increase the complexity and the cost of the participation process. The challenge is to find the optimum balance between these risks (Luyet, 2012).

This paper presents the results of SA conducted in the Kingdom of Jordan with the purpose to support local water security action planning, as part of the project "Sustainable Use of Transboundary Water Resources and Water Security Management" implemented by Regional Environmental Centre in the Middle East and North Africa (MENA) region.

2. METHODOLOGY

In the first step of stakeholder analysis we identified relevant stakeholders through the use of snowball technique that starts with brainstorming session performed by an expert group (Stanghellini and Collentine, 2008). The obtained stakeholders list was submitted to some of the identified stakeholders, asking them to add one or more important actors. Afterwards all stakeholders were assigned to one of the five stakeholder groups: governmental authorities, academia, business sector, civil society and group "other".

In the second step of the analysis stakeholders were characterized based on attributes presented in Table 1. Information for stakeholder characterization were obtained through semi-structured questionnaire designed following the approach suggested by Schmeer (1999) and tailored for water management and in particular for local water security action planning. Almost all answers given by the stakeholders were consistent, thus only very few had to be modified through triangulation. Power and interest of stakeholders were assessed using power versus interest diagram, technique from Eden and Ackermann (1998), used to group stakeholders into players, subjects, context setters, and crowd (De Lopez, 2001; Reed 2009; Bryson et al., 2011). Players are key stakeholders with both an interest and significant power, who are in a prime position to affect the water management process. Subjects have an interest but little power. It is important to support and enhance Subjects' capacity to be involved, especially when they are affected by the outcomes of the process. Context setters are highly influential, but have little interest. Because of this, they may be a significant risk, and should be monitored and managed (Reed 2009). Crowd consists of stakeholders with little interest or power and there is a little need to consider them in much detail. However, they need to be informed to secure that they would not turn into a very interested mob.

Data from 112 questionnaires were transferred into SPSS[®] ver. 20.0 (IBM, 2011) software which was used to conduct relevant statistical analysis. Dependence among parameters was examined by Chi-square test of independence. The variables which were tested in this study include: (i) knowledge and interest, (ii) knowledge and power, (iii) attitude and knowledge, (iv) attitude and power, (v) knowledge and level of legitimacy, (vi) power and level of legitimacy, (vii) knowledge and attention-getting capacity, (viii) attention-getting capacity and power, (ix) knowledge and level

of stakeholder participation in water management planning process and (x) level of stakeholder participation in water management planning process and power. Statistical correlations between variables were measured by Chi-square test of independence ($\alpha=0.05$) and Likelihood Ratio.

Table 1. Attributes and value scales used in the stakeholder interview questionnaire (adapted from Caniato et al. 2012)

Attributes	Value scales
Power - this reports on the self-declared perception of power, based on availability and access to resources and the ability to mobilize them.	1. Low 2. Medium 3. High
Interest in the case - this describes the self-reported level of interest of the interviewed stakeholder in water resources management.	1. No or minimum 2. Limited 3. General 4. High 5. Primary
Knowledge about water resources management - this describes the self-reported level of knowledge of the interviewed stakeholder regarding the case.	1. No or minimum 2. Lacking 3. General 4. Deep
Attitude – reports on the extent to which stakeholders will support or resist to the water resources management process (Murray-Webster and Peter Simon, 2006).	1. Strongly positive 2. Positive 3. Slightly positive 4. Neutral 5. Slightly negative 6. Negative 7. Strongly negative
Legitimacy - this reports on the self-declared perception or assumption of socially accepted and expected structures or behaviors (Mitchell, 1997, Suchman et al., 1995).	1. Low 2. Medium 3. High 4. No legitimacy
Attention getting capacity (urgency) - this parameter concerns the self-reported capacity to claim call for immediate attention among all interested parties in water sector (Mitchell et al., 1997).	1. Very low 2. Low 3. Acceptable 4. Good 5. Very good
Existing level of involvement in water management process.	1. I am informed 2. I am consulted 3. I am involved 4. I participate actively in water management planning
Desired level of involvement in water management process.	1. I should be informed 2. I should be consulted 3. I should be involved 4. I should participate actively in water management planning

3. RESULTS AND DISCUSSION

In the first step of analysis, the list of 149 stakeholders, representatives of different institutions and organizations, were identified and all of them got link to the on-line questionnaire by e-mail. In the first round we got 57 responses but after 2 reminders and the first project workshop we finally had 112 respondents representing 41 different institutions who have stake in water management (Table 2).

Identified stakeholders afterwards were assigned to one of the five stakeholder groups with their specific roles in water resources management: governmental authorities ($n = 14$), academia ($n = 5$), business sector ($n = 9$), civil society ($n = 11$), other ($n = 2$), as presented in Table 3.

In the second step, we analyzed stakeholders' power and interest, knowledge, attitude, legitimacy, attention-getting capacity and level of involvement in water management.

Table 2. Identified stakeholders with abbreviations used in text

ABAU	Al-Balqa' Applied University	LHAP	Land and Human to Advocate Progress
ACC	Agricultural Credit Corporation	MEIH	Majlis El Hassan Organisation
ACWUA	Arab Countries Water Utilities Association	MoA	Ministry of Agriculture
ADEng	Arab Dar Engineering	MoE	Ministry of Environment
AG	Arabia Group	MoH	Ministry of Health / Environmental Health Directorate
AssIG	Association imprint goodness	MoMA	Ministry of Municipal Affairs
Eco Peace	Eco Peace Middle East	MoWI	Ministry of Water and Irrigation
EDAMA	Edama Association	MU	Mutah University
ES AL Karak	Environmental Society Al Karak	PMedE	Pan Med Energy
FPEC	Future Pioneers for Empowering Communities	PSD	Public Security Directorate
GIZ	German Society for International Cooperation	RAED	Arab Network for Environment and Development "RAED"
GrTech	Green Tech Sustainable Environment	RSS	Royal Scientific Society
IUCN	International Union for Conservation of Nature, Regional Office for West Asia	Samra	Samra - Samra Wastewater Treatment Plant Company
JOCCEPS	The Jordanian Climate Change and Environment Protection Society	SEES	Sustainable Environment & Energy Solutions
JORCS	JORCS Consultant	TAG	Talal Abu Ghazaleh Organization
JUoST	Jordan University of Science & Technology	UoJ	University of Jordan
JVA	Jordan Valley Authority	USDWE	United Society for Developing Water Resources & Environment
LG	Local government	WAJ	Water authority of Jordan

Table 3. Main stakeholders group and their role

Stakeholder group	Type of stakeholders	Number of stakeholders	Main role in water resources management
Governmental authorities	Ministries	5	Regulation and law enforcement
	Public utility companies	2	
	Local government	6	
	Directorates	1	
Business sector	Service suppliers	7	Economical and financial performance
	Technology suppliers	1	
	Wastewater treatment facilities	1	
Academia	Universities	4	Research and innovation
	Research centers	1	
Civil society	Nongovernmental organizations	11	Public awareness, environmental protection.
Other stakeholders	International organizations	2	Public awareness, environmental protection.

3.1 Analysing power and interest stakeholders

Using power versus interest diagram in our study we divided stakeholders into following categories:

Key Players with primary interest and high power: governmental institutions (MoWI), academia (UoJ), business sector (JORCS, ADEng), and civil society (RAED).

Key Players with high interest and high power: governmental institutions (JVA), civil society (SEES, ES AL Karak, ACWUA) that have both high power and high interest.

Small Players with primary interest but medium power: governmental institutions (MoH), academia (ABAU), civil society (MEIH, Eco Peace).

Small Players with high interest and medium power: governmental institutions (MoMA, LG from 6 municipalities, WAJ, PSD), academia (JUoST, MU, RSS), business sector (Samra, ACC, GrTech, TAG, AG), civil society (FPEC, LHAP, USDWE, JOCCEPS, EDAMA, ES AL Karak) and Other (IUCN). Representatives of this group could be also considered as a Subjects.

Group with power but little direct interest are considered to be intermediary group between context setters and Key Players. This group is made of governmental institutions (MoE, MoA), business sector (PmedE), civil society (AssIG) and Other (GIZ).

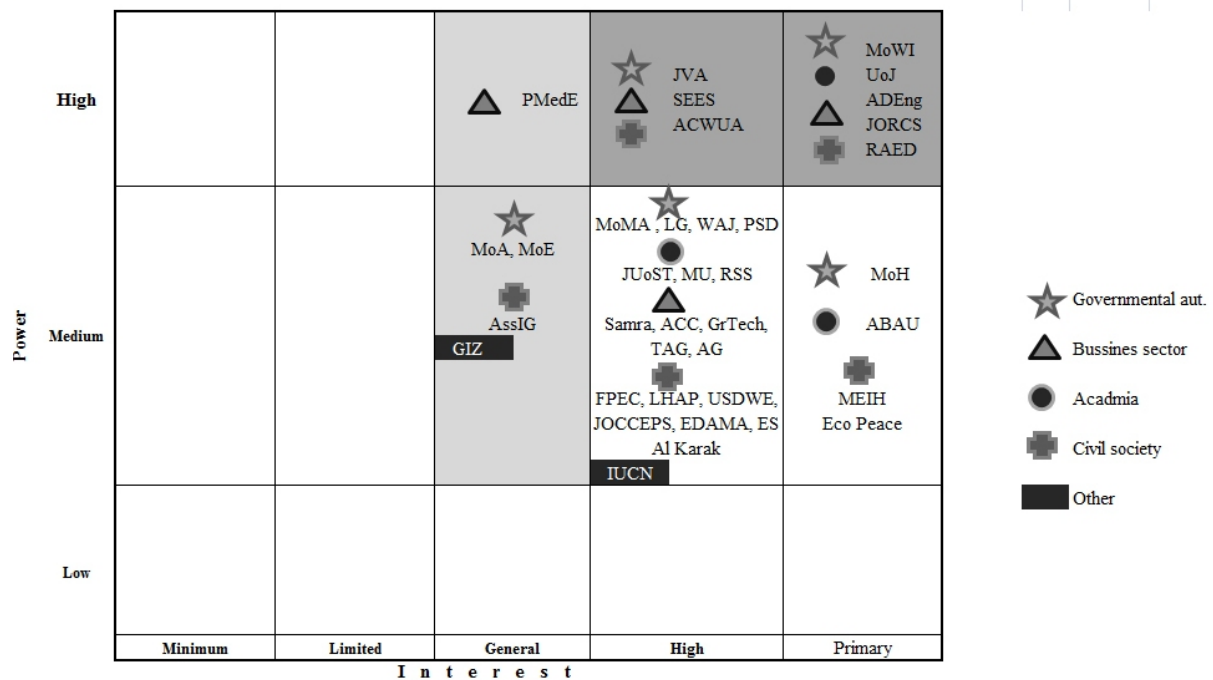


Figure 1. Power versus interest diagram

The only clear key players among governmental institutions are MoWI and JVA which is in line to their legal responsibilities in water management sector. All other sectors have their representatives in this group indicating already established multistakeholders approach to water management. Study shows absence of clear subjects since all explored stakeholders with medium power and at least high interest are rather small players than subjects. The group of small players is quite heterogenic with a variety of reasons to be interested in water management issues. Finally, analysis showed that there are neither group of context setters nor crowd.

3.2 Analysis of stakeholder knowledge

The results of the knowledge analysis showed that stakeholders are quite knowledgeable about water resources and management: 100% of respondent from academia group and 64% of respondent from civil society have complete knowledge, while no stakeholder groups expressed to have low level of knowledge (Figure 2). Majority of governmental authorities' representatives (79%) declared to have general, while 21% have complete knowledge. High level of knowledge within business sector is quite expectable (44% of complete knowledge) since it contributes to their competitiveness in the market.

Cross tabulation of respondents' "Knowledge about water management issues" and "Interest to participate in water management planning process" shows that over 50% of respondents with complete and general knowledge have high interest. Complete knowledge is almost, above 92%, associated with high or primary interest. The results of Pearson Chi-squared test for the independence ($\chi^2=10.763$, $p=0.005$) indicates significant correlation between the respondents level of knowledge and level of interest for water resources management (Table 4). It is clear that stakeholders are knowledgeable on the water management process as long as they are interested in it. Stakeholders with high level of both interest and knowledge, such as representatives of academia and civil society, should be more involved to get valid support to water management process.

Comparison of “Knowledge” and “Power in water management sector” shows that medium power is in 70% of cases associated with general knowledge. Complete knowledge is never associated with low power and is split between high power, 46%, and medium power 54%. These results show significant correlations since Likelihood Ratio is $\chi^2=19.277$ and $p=0.000$ (Table 3).

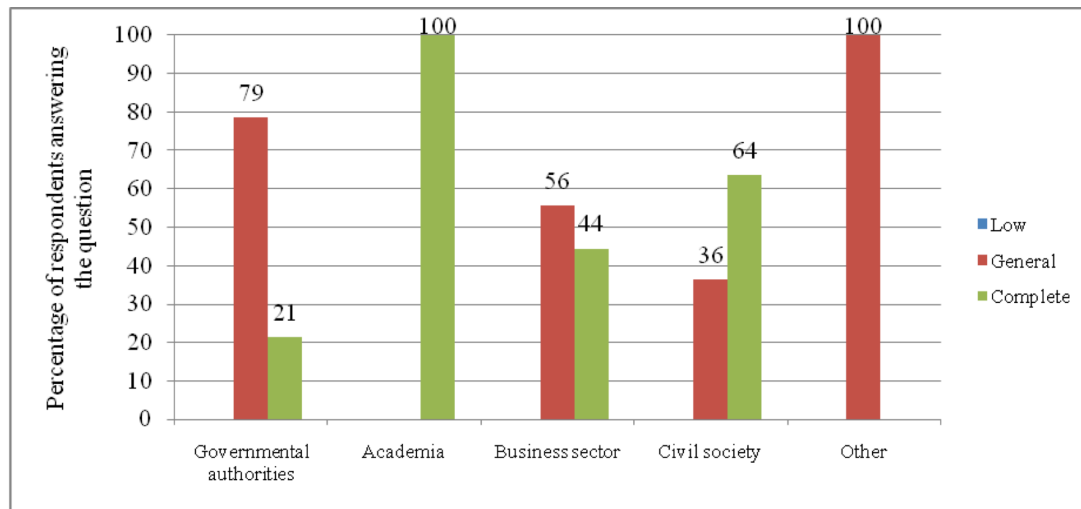


Figure 2. Level of knowledge regarding water management issue per main groups in percentage (%)

Local government, Ministries such as MoMA, MoH and MoE, and majority of CSO representatives have medium power but significant level of knowledge. They should be more involved in water management process to make it more participatory, flexible and more adaptable to changing environment and local needs.

3.3 Analysis of stakeholder attitude

Survey findings reveals that representatives of business sector and academia, with 78% and 60% strongly positive supporters respectively, were more supportive in comparison to other stakeholder groups (Fig. 3). Governmental sector has 29% of strongly positive and 36% of positive supporters, while 28% of respondents are neutral. Local government turned to be neutral which is in line to its medium power and average water resources management knowledge.

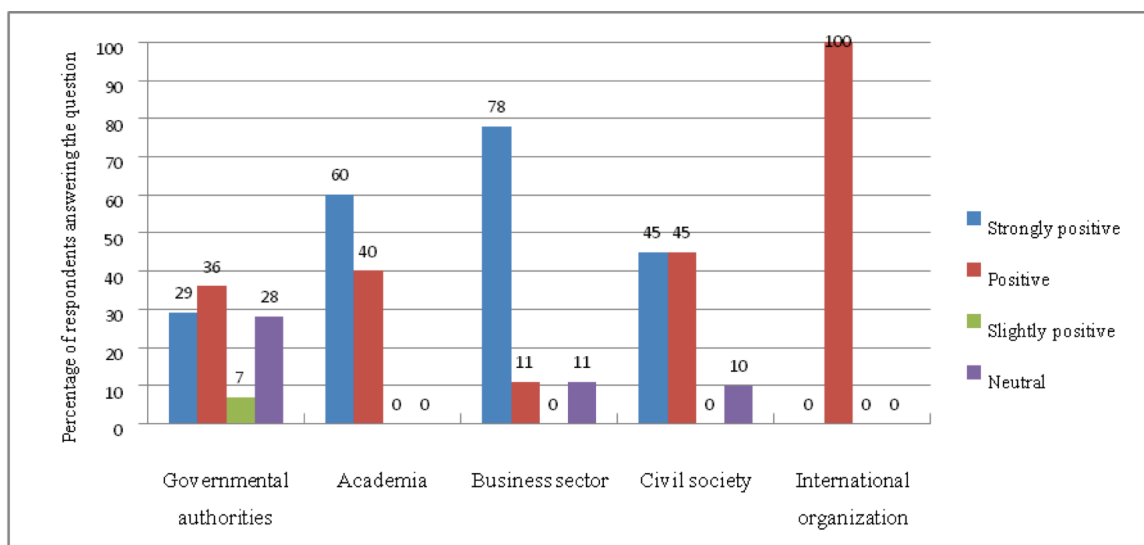


Figure 3. Stakeholders attitude towards the water management planning process in Jordan in percentage

Cross tabulation of respondents' "Attitude towards the water management planning process" and "Knowledge" shows that strongly positive attitude is, in 69% of cases, related to complete knowledge, while all other categories for attitude are primarily associated with general knowledge. Statistical significance is confirmed by Pearson Chi-Square $\chi^2=21.321$ and $p=0.000$ (Table 4).

Cross tabulation of "Attitude" and "Power in water management sector" shows that positive (34%) and strongly positive (46%) represent a majority of answers and that they are primarily associated with medium (66% of cases) and high power (26% of cases). This is statistically significant since Likelihood Ratio is $\chi^2=25.023$ and $p=0.000$ (Table 3).

Local government of 6 municipalities involved in survey has the neutral attitude towards the water management planning process which is in line to their medium power and average water resources management knowledge. This nevertheless could impose a certain risk to sustainability of water resources management, having in mind that all strategic documents and plans get implemented at local level. One way to involve stakeholders with neutral attitude is to maintain good contacts with them and pursue an open and transparent communication channel, so that they are recognized as being in charge. Long term strategy for making them more supportive is to empower them with knowledge and more legal rights in water management sector at local level.

3.4 Analysis level of legitimacy

Data on stakeholders' legitimacy shows that all groups of stakeholders, have high or medium legitimacy. The most legitimate groups are civil society and academia with 82% and 60% of respondents respectively, claimed to have high legitimacy (Fig. 4). Legitimacy of governmental authorities is equally split between medium and high, which indicates that water management should be more conducted in bottom-up manner.

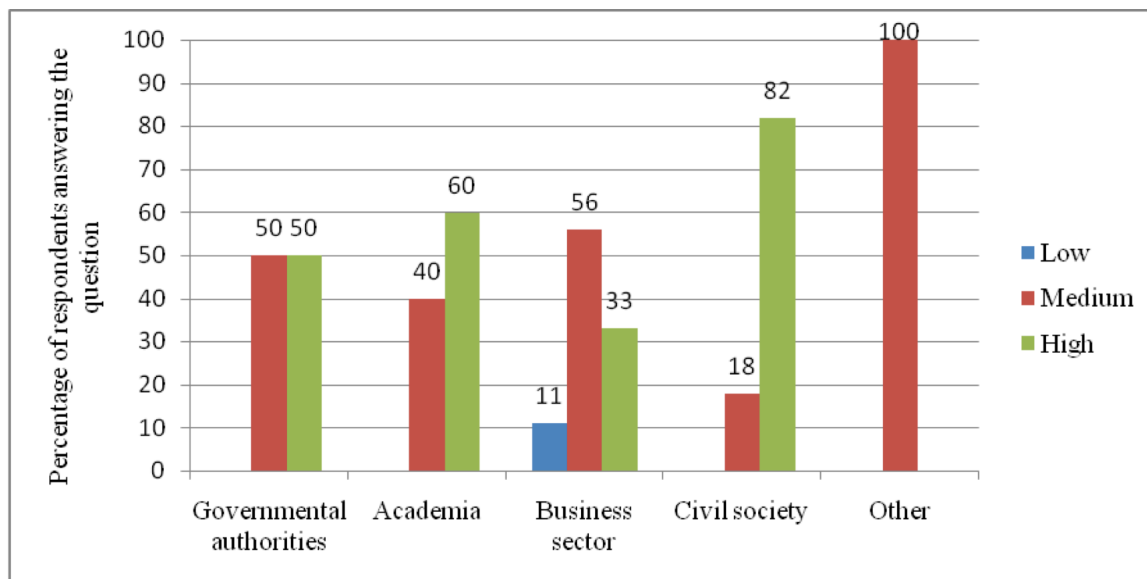


Figure 4. Level of stakeholder legitimacy to participate in water management process

Cross tabulation of "Knowledge" and "Level of legitimacy" shows that most answers are in high legitimacy category, over 58%. No significant statistical correlation was found since actual count of answers is similar to expected. Values for Likelihood Ratio are $\chi^2=3.824$, $p=0.148$.

Comparison between "Power" and "Level of legitimacy" shows that high (54%) and medium (40%) legitimacy is primarily associated with medium power in water management sector. However, there is no statistical significance, values for Likelihood Ratio are $\chi^2=4.366$, $p=0.359$.

3.5 Analysis of attention-getting capacity

Assessment of stakeholders' attention-getting capacity on the scale from very low to very good shows that the best attention getting capacity have stakeholders from academia and governmental authorities group (Fig.5). Highly positioned capacity of governmental authorities (57% good and 29% very good) is in line to their power and high institutional capacity. On the other hand, good results in academia's attention getting capacity is result of their expertise respected among all stakeholders.

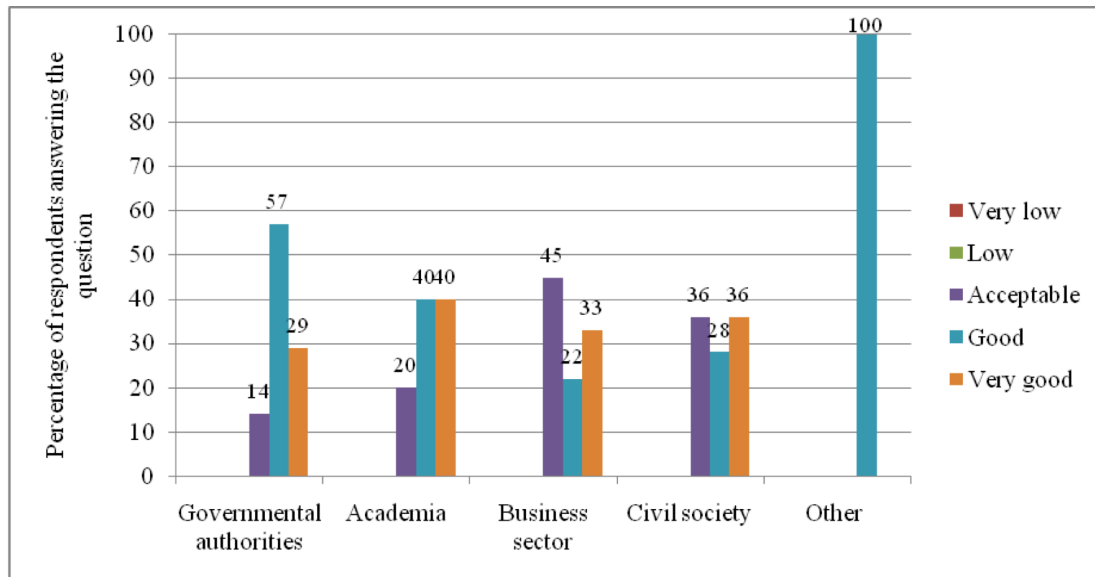


Figure 5. Level of stakeholder attention getting capacity in water management process per main stakeholder group

Comparison of “Knowledge” and “Attention-getting capacity” shows that higher level of knowledge is associated with higher attention-getting capacity: 92% of answers with complete knowledge are related to good and very good capacity, while 87% of answers from the general knowledge category are split between acceptable and good knowledge. Results of the Chi-square test of independence showed a highly significant relationship ($\chi^2=30.009$, $p=0.000$) between analyzed attributes (Table 3).

Comparison of “Attention-getting capacity” and “Power” reveals that most respondents, over 41%, are in the good attention-getting capacity category and they are primarily, in 65% of cases, associated with medium power. Acceptable attention-getting capacity is also mostly connected to medium power, over 73% of cases, while for very good category there is a same amount of answers connected to high and medium power. These results show significant correlations since Likelihood Ratio is $\chi^2=15.864$ and $p=0.003$ (Table 3).

All stakeholder groups have certain percentage of representatives who stated to have acceptable attention-getting capacity. In order to improve their capability of claiming call for immediate attention among actors in water sector, and thus make water management process more efficient, it is necessary to strengthen their both knowledge and power.

3.6 Level of stakeholders involvement in water management

Assessment of existing situation regarding level of stakeholders' participation in water management shows variations among identified stakeholders groups. As presented by Figure 6, governmental authorities have the highest level of participation with 42% of respondent being involved and 37% participating actively in water management. However, 14% of respondent claimed to be informed, which is the lowest level of participation. Stakeholders participating in

water management at lowest level are local authorities. It is expected finding, having in mind their neutral attitude and soft power.

More than half of civil society representatives (55%) are involved in water management process, 18% participate actively, while 18% only receive information regarding water related issues.

Academia has 40% of respondents who participate actively in water management which is expected, having in mind their scientific expertise necessary for sustainable water management planning. Business sector is mostly informed and rarely participate actively in water management planning.

Analysis of desired level of involvement in water management process, presented by Figure 7, shows that representatives of governmental institutions and academia want to participate actively (86% and 100% respectively). Civil society has shared view about desired level of participation, 64% of respondents want to participate actively, while the rest of 36% is satisfied in case they are involved. Unlikely to the other groups, majority of business sector representatives are satisfied to be consulted (45%), 22% of them want to be involved and 33% to participate actively.

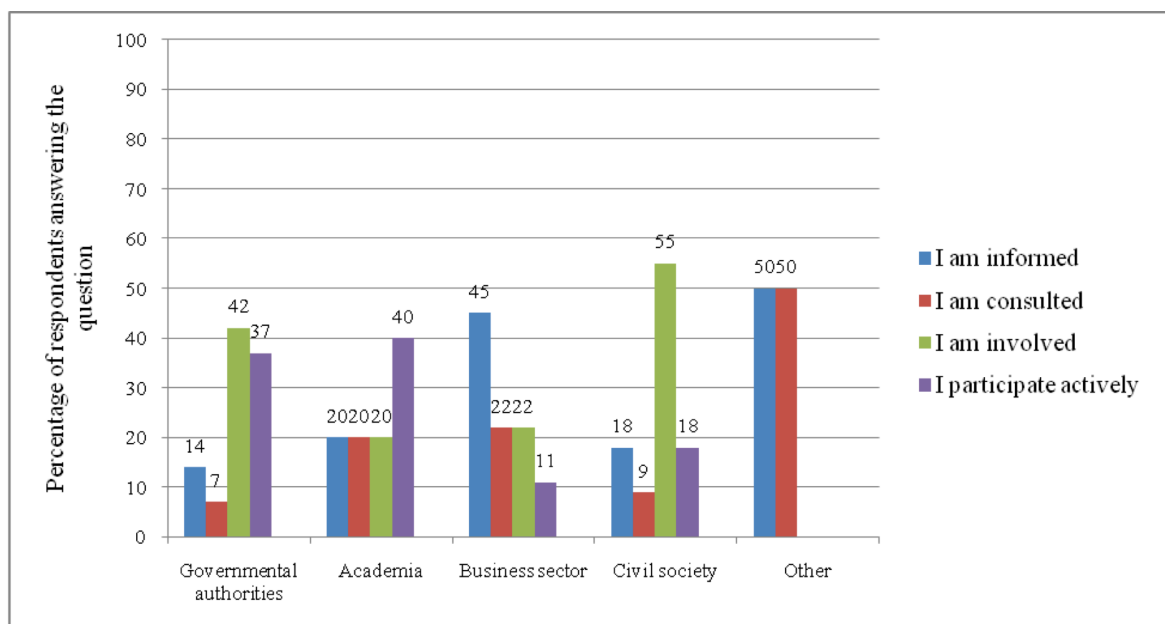


Figure 6. Existing level of stakeholders' participation in water management process in percentage

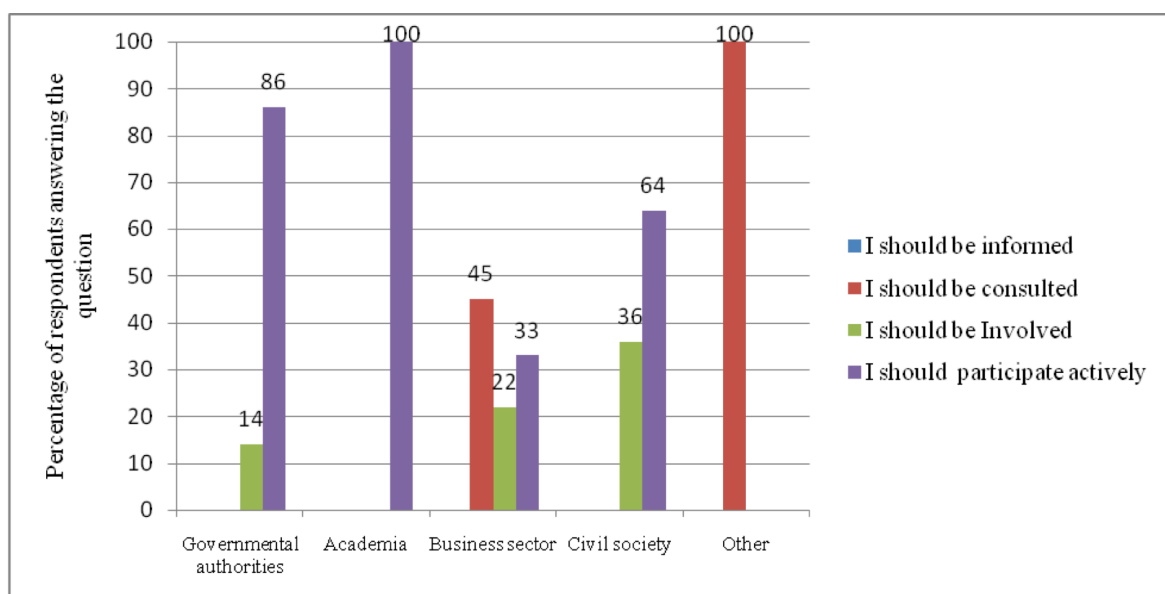


Figure 7. Desired level of stakeholders' participation in water management process in percentage

Cross tabulation of respondents' "Knowledge" and "Level of stakeholder participation in water management planning process" shows that most respondents, over 64%, are involved and actively participate in water management planning process and that they are associated almost equally with good and complete knowledge. This is a significant correlation since the values for Pearson Chi-Square are $\chi^2=12.313$, $p=0.006$ (Table 3).

Comparison between "Level of stakeholder participation in water management planning process" and "Power in water management sector" reveals that over 63% of answers are in involved and actively participate category for level of stakeholder participation. Involved answer is almost always, over 88%, associated with medium power, while active participation is split between high (53%) and medium (47%) power. Statistical significance is obvious since value for Likelihood ratio is $\chi^2=40.267$ and $p=0.000$ (Table 3).

Table 4. Results of Chi-Square tests

Comparison	Pearson Chi-Square	Likelihood Ratio	df	Cells with expected count less than 5	Asymp. Sig. (2-sided)
Knowledge and interest in water resources management	10.763	-	2	0 cells (0.0%)	0.005
Knowledge and power in water resources management	-	19.277	2	2 cells (33.3%)	0.000
Attitude and knowledge in water resources management	21.321	-	3	1 cell (12.5%)	0.000
Attitude and power in water management sector	-	25.023	6	6 cells (50.0%)	0.000
Legitimacy and knowledge in water resources management	-	3.824	2	2 cells (33.3%)	0.148
Legitimacy and power in water resources management	-	4.366	4	5 cells (55.6%)	0.359
Attention getting capacity and knowledge in water resources management	27.596	-	2	0 cells (0.0%)	0.000
Respondents attention getting capacity and power in water resources management	-	15.864	4	3 cells (33.3%)	0.003
Level of stakeholders participation and knowledge in water resources management	12.313	-	3	0 cells (0.0%)	0.006
Level of stakeholders participation and power in water management sector	-	40.276	6	4 cells (33.3%)	0.000

4. CONCLUSION

Conducted survey shows that stakeholders in water management in Jordan could be classified based on their power and interest into two groups: key players and small players, with representatives of all sectors in both groups. This indicates that multistakeholders approach to water management exists. In order to secure success of multistakeholders approach it is necessary to include less powerful but interested stakeholders - small players, having in mind that the majority of respondents covered by survey belongs to this group.

Most knowledgeable stakeholders groups are academia and civil society, while the most supportive are academia and business sector. Local government turned to have neutral attitude towards water management which is in line to its medium power and average water resources management knowledge.

The most legitimate stakeholder group in water management sector is civil society, while the groups with most attention getting capacity and the highest level of participation in water management have governmental authorities and academia.

Conducted survey shows that there is significant statistical correlation between stakeholders' level of knowledge about water management issues and power on one side and their interest, power, attitude, attention-getting capacity and level of participation in water management process, on the other side.

What is more, survey revealed that level of legitimacy for participation in water management process does not depend neither on stakeholders' knowledge nor on their power.

Results of survey imply that education and empowerment of stakeholders are important for smooth and successful participatory approach to water management and local water security action planning process. Activities should be focused on development of local competences in setting local water management policy and development, implementation and updating of local water security action plans. These actions are profound step change and necessary precondition for effective management of growing water crisis in Jordan.

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