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LEB RELIEF
We World

Stakeholder Network Analysis

Presentation of findings

HawkaMaa-EU

IMPACT Shaping practices Influencing policies Impacting lives
REACH | PANDA | AGORA

Contents

A

Assessment questions and methodology

Research Questions

To understand key stakeholder relations around three river basins in Lebanon-Mount Lebanon (Al-Ghadir), North Lebanon (Al-Ostuan) and the Beqaa (Al-Assi) to better inform the catchment area management plans, the RBM workshops and the implementation of relevant measures as to roles, responsibilities and barriers around river basin management.

Specific research questions:

1. Who are the stakeholders at the river basin level?
2. How do the key stakeholders view other stakeholders' roles and responsibilities?
3. What are the relationships between them?
4. Are there tensions between stakeholders in their roles, on paper or in practice?
5. Who are the main stakeholders (influence, network, persuasive/institutional power, centralized position) to target when implementing sustainable river basin management plans?
6. What are the top challenges with regards to the water resource management currently?

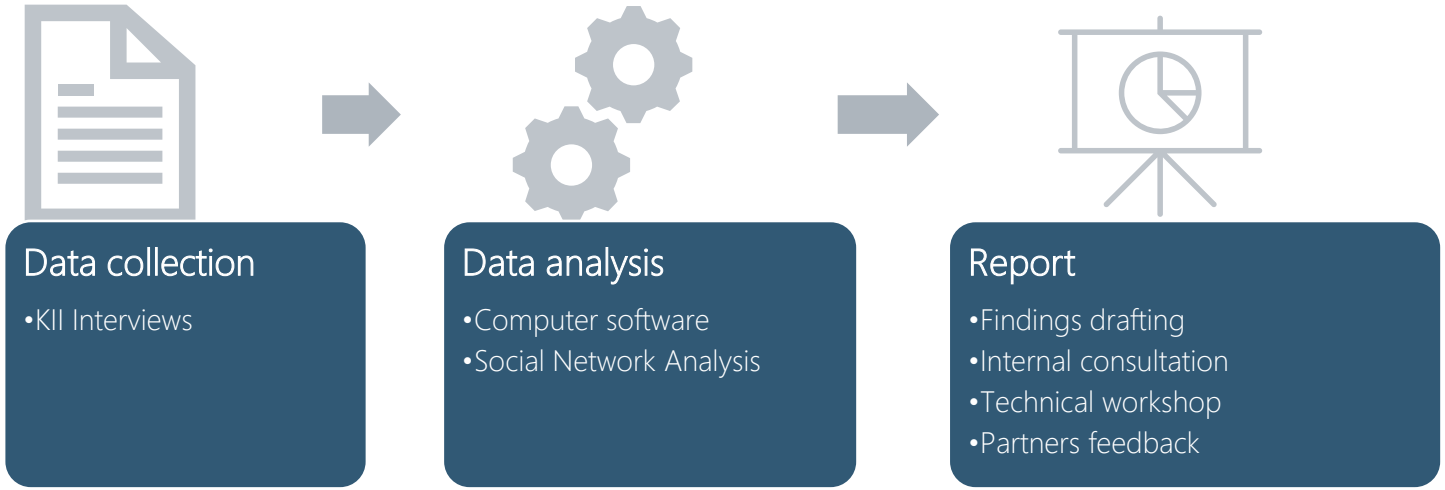
Workshop objectives:

Present the finding & recommendations generated from the data collection

Methodology

Data collection partners	ACTED – P&P – Al-Ghadir river basin in Mount Lebanon LebRelief – Al-Ostuan river basin in North Lebanon WeWorld-GVC – Al-Assi river basin in the Beqaa
Design:	Key Informant Interviews Quantitative and qualitative survey
Dates of data collection:	February-March 2023
Sample size:	N=103
Sample:	Diverse groups of river basin stakeholders: Municipalities, Civil Society Organizations, ministries, unions, governors, members of parliament, LNGOs, Water Establishments (WEs), Universities, agriculture extension center (MoA local representation), farmers/farmers associations, industries, mukhtars, political parties.
Analysis Technique:	Illustrate links between actors and sketch a network of connections. Many tools and techniques are available for network analysis, including graph theory, centrality measures, and network visualization methods

Methodology



Social Network Analysis (SNA)

- A network analysis is a way to identify reported links between stakeholders and their interactions
- Focus on the relationships established between social entities (individuals, groups, etc.)
- Consists of a sets of actors or groups and the relations defined on them and between them

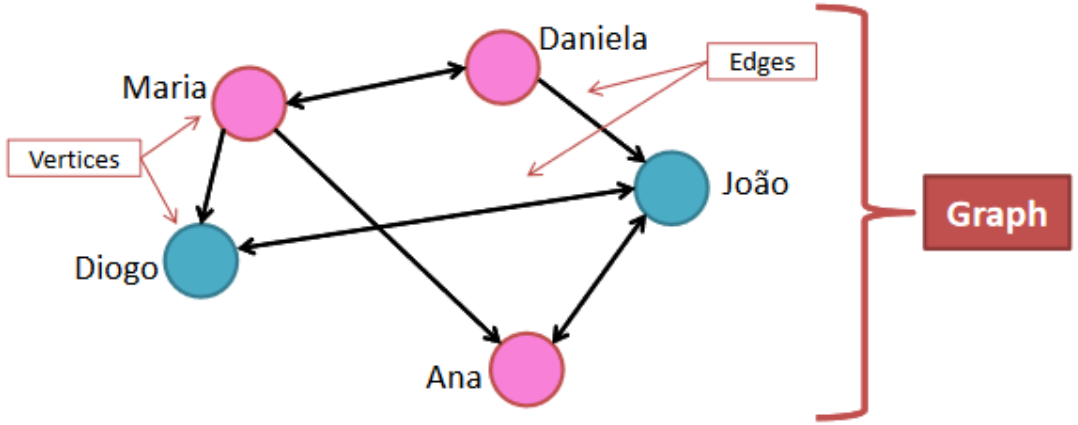
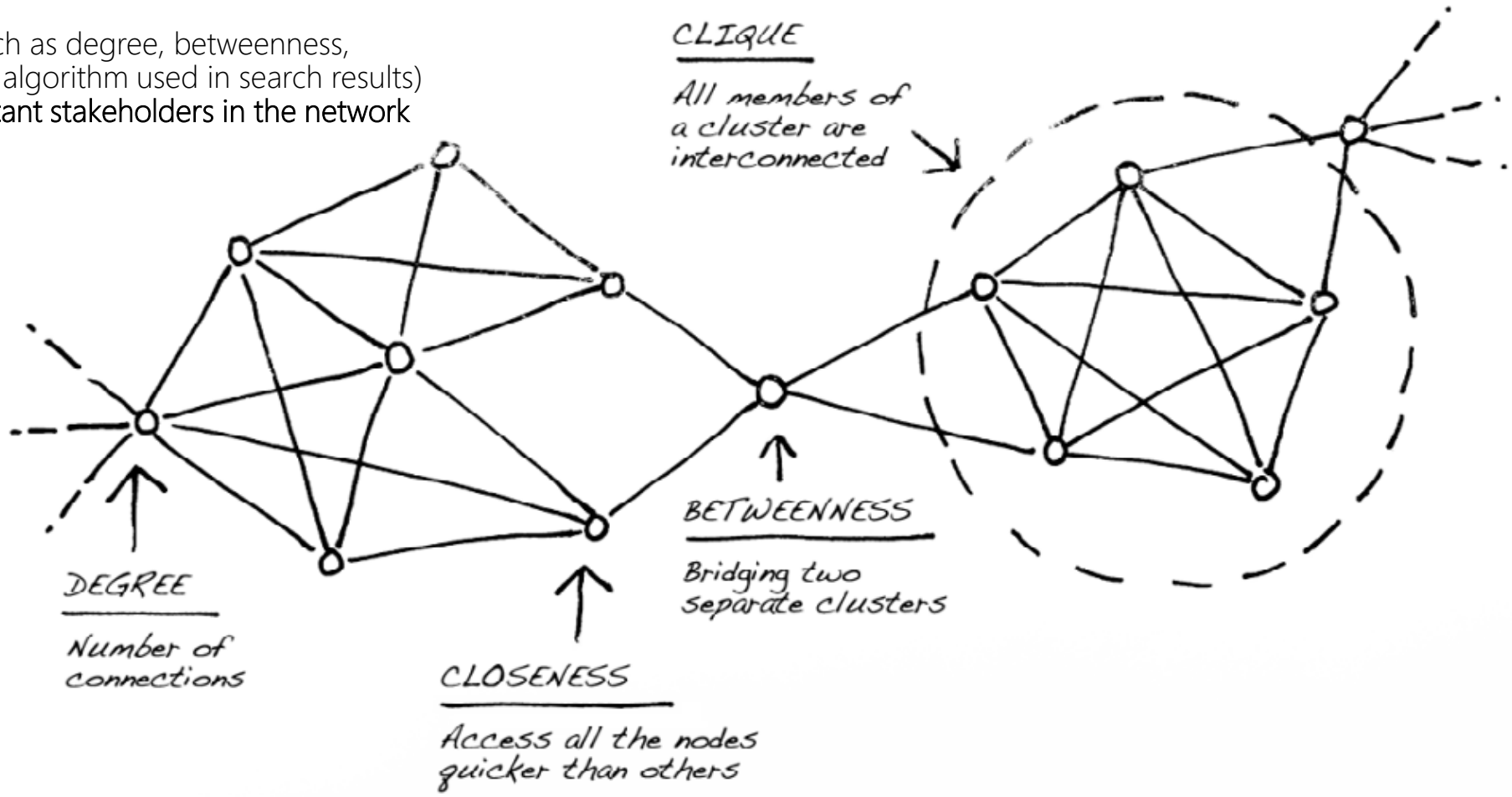


Table 1 Network Notions and Definition

Notion	Definition	Description	Symbol of the notion in the maps
Node (Vertex)	A unit of a network (e.g. a stakeholder is the node of the stakeholders' network)	The size of the node in the map is dependent on its weight, which is defined by the variable each node is representing. Different types of maps highlight different centrality measures, and the size of the node will vary according to the centrality measure it is portraying.	
Edges	The line connecting two nodes representing the presence of a relationship	Each edge could have a weight-value represented by the thickness of the arrow. Each edge could be directed* or undirected*. The thickness of the arrows either highlights the frequency of communication or its weight.	

Social Network Analysis (SNA)

- Investigate the degree of influence of each actor or group within a network
- Uses centrality measures, such as degree, betweenness, closeness, and rank (Google algorithm used in search results) to highlight powerful/important stakeholders in the network



Stakeholder Network Analysis

in Al Assi, Al Ostuan, Al Ghadir

1. Who are the stakeholders at the river basin level?

Key Informants Categories

1. Who are the stakeholders at the river basin level?

Al Assi	#	%
Water Establishments	3	9
L-NGO	9	27
Ministries	2	6
Municipalities	8	24
CSO	1	3
Private Sector	4	12
Committees	3	9
Unions	1	3
Governors	1	3
Industries	1	3

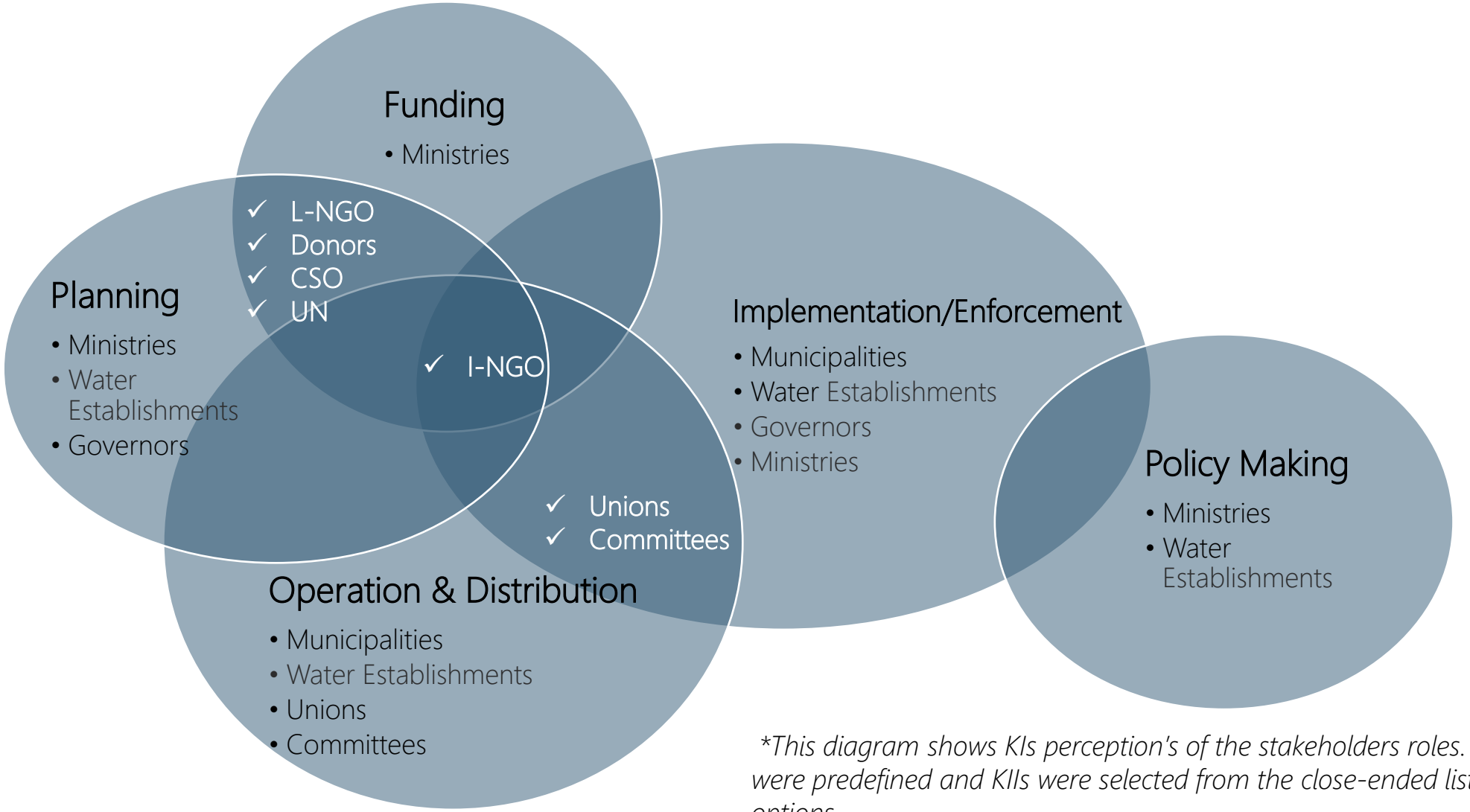
Al Ostuan	#	%
CSO	9	24
Municipalities	23	62
Water Establishments	3	8
L-NGO	2	5

Al Ghadir	#	%
Municipalities	16	48
L-NGO	8	24
Universities	4	12
Governors	1	3
Water Establishments	1	3
Ministries	3	9

2. How do the key stakeholders view other stakeholders' roles and responsibilities?

2. How do the key stakeholders view other stakeholders' roles and responsibilities?

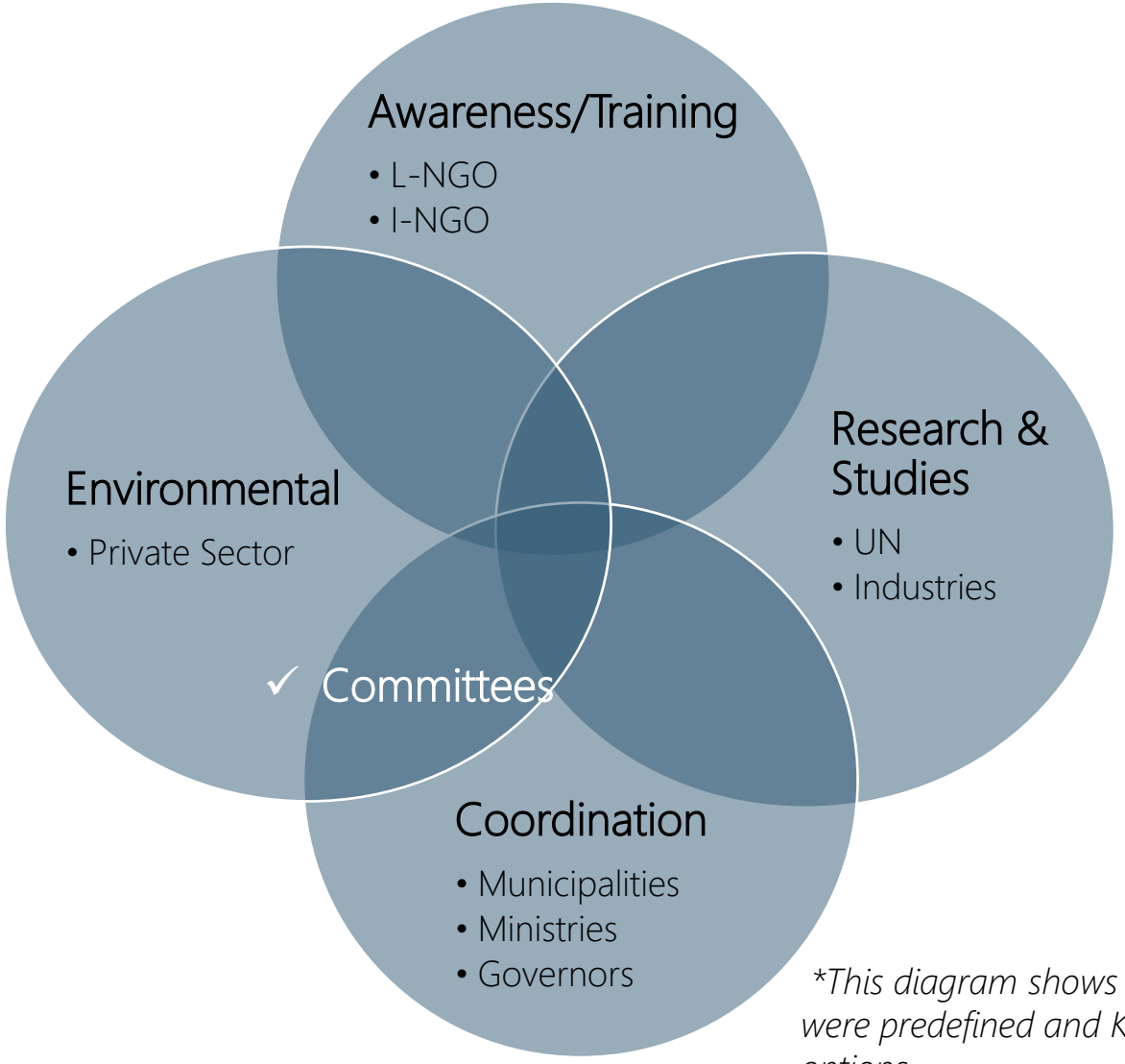
Diagram 1: Functional roles in water management*:



*This diagram shows KIs perception's of the stakeholders roles. Roles were predefined and KIIs were selected from the close-ended list of options

2. How do the key stakeholders view other stakeholders' roles and responsibilities?

Diagram 2: Directional roles in water management*:



*This diagram shows KIs perception's of the stakeholders roles. Roles were predefined and KIIs were selected from the close-ended list of options

3. What are the relationships between them?

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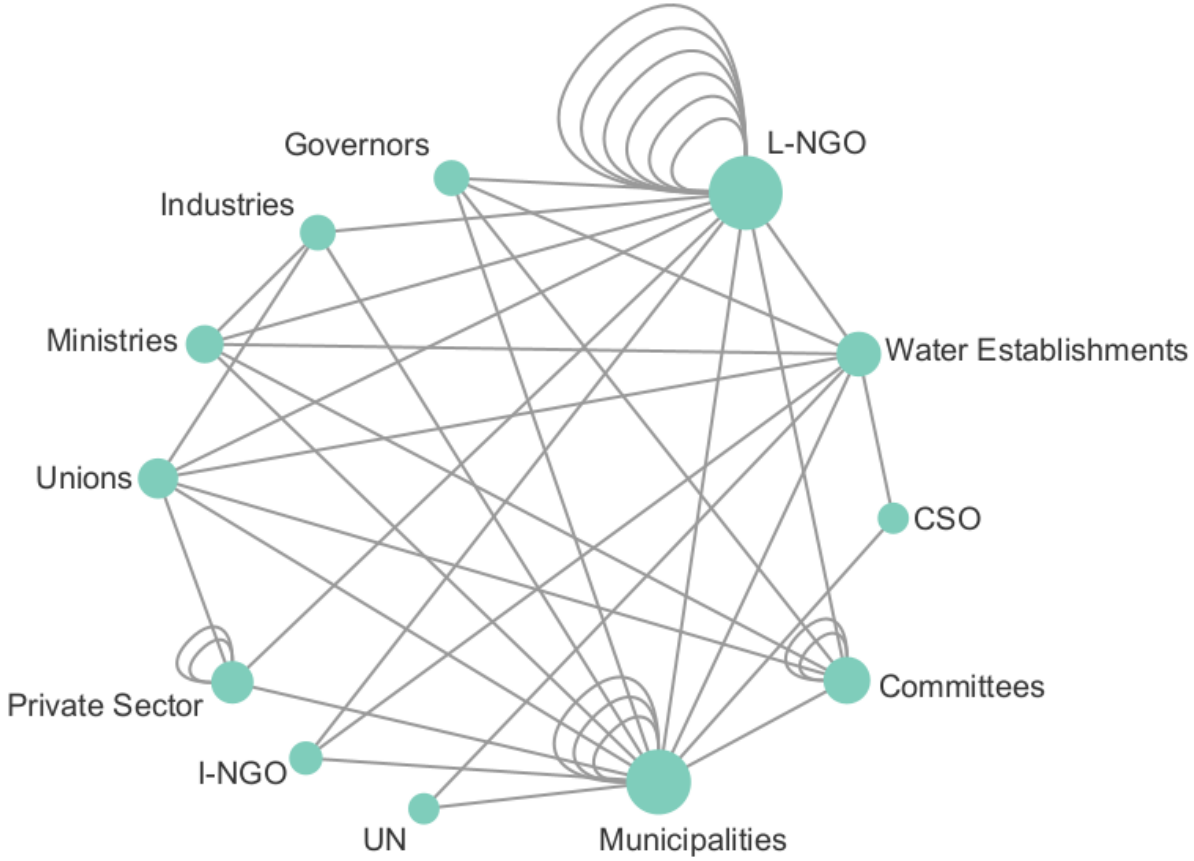
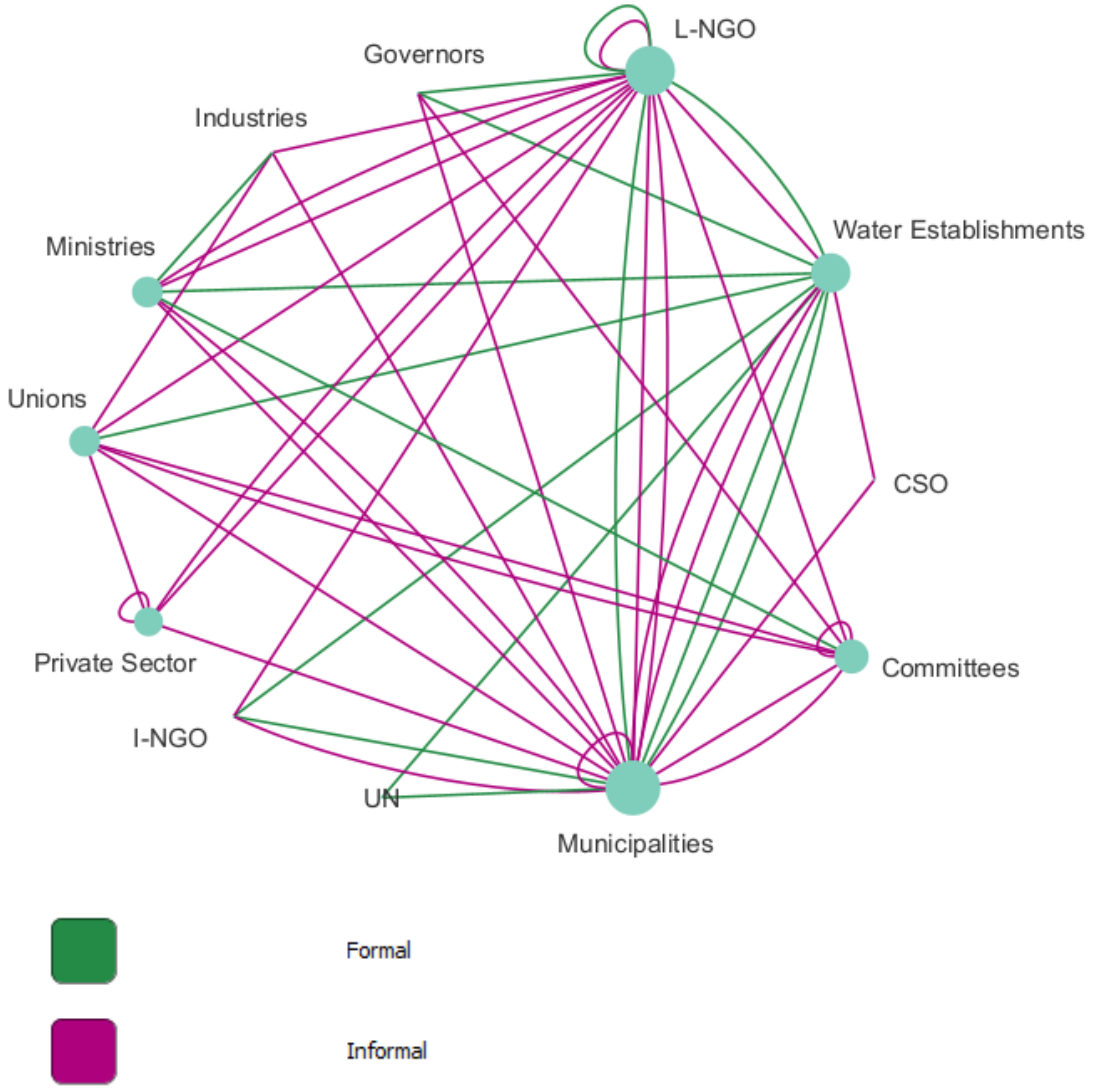
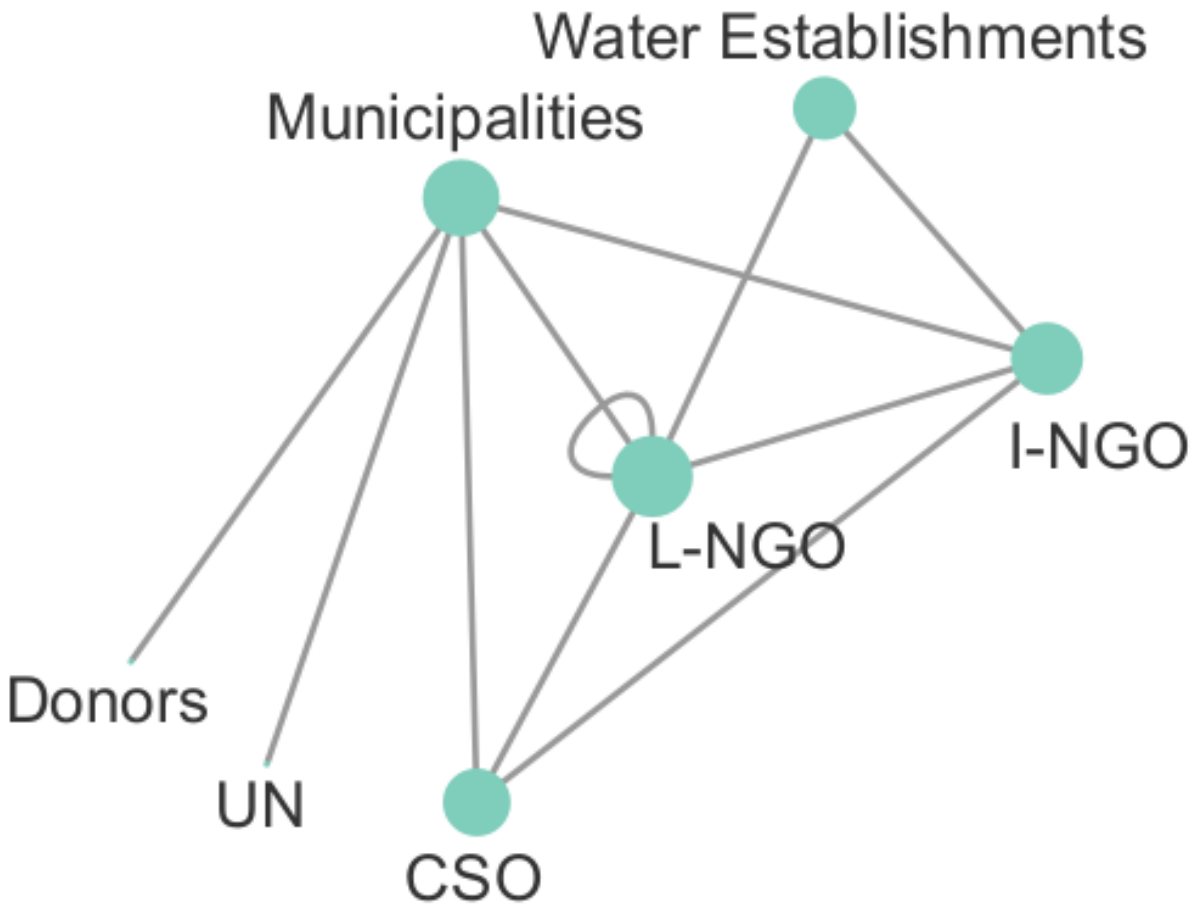
Al Assi

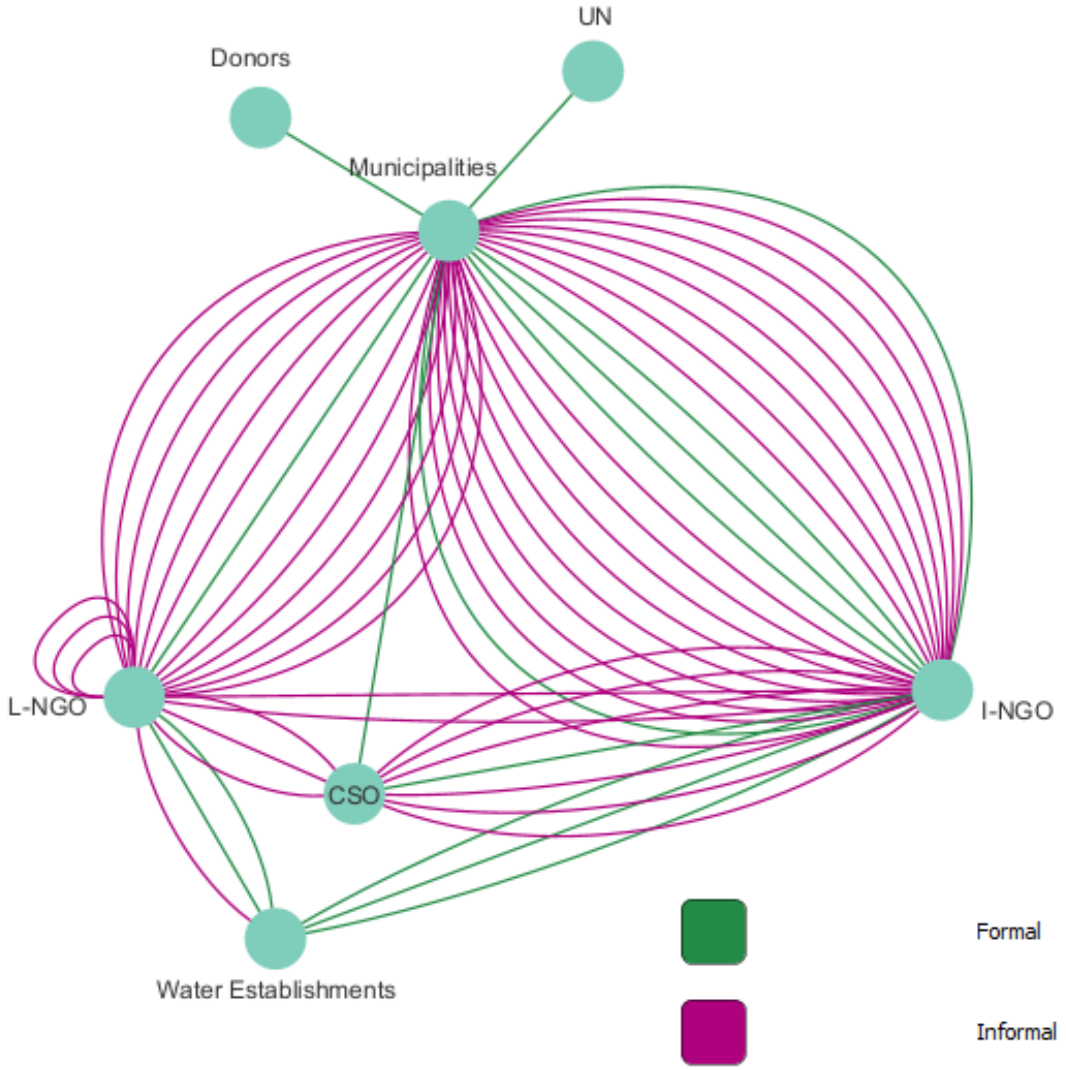




3. What are the relationships between them?

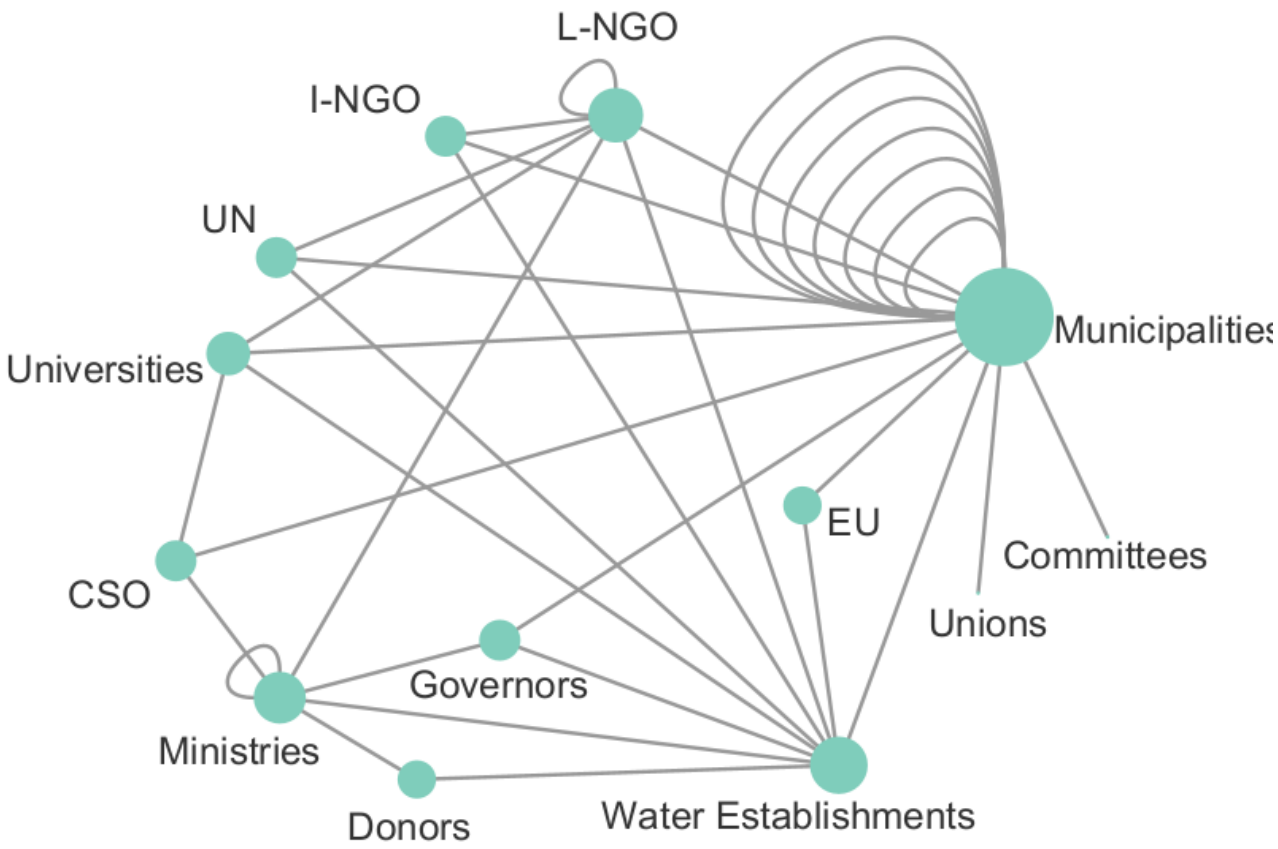
Al Ostuan

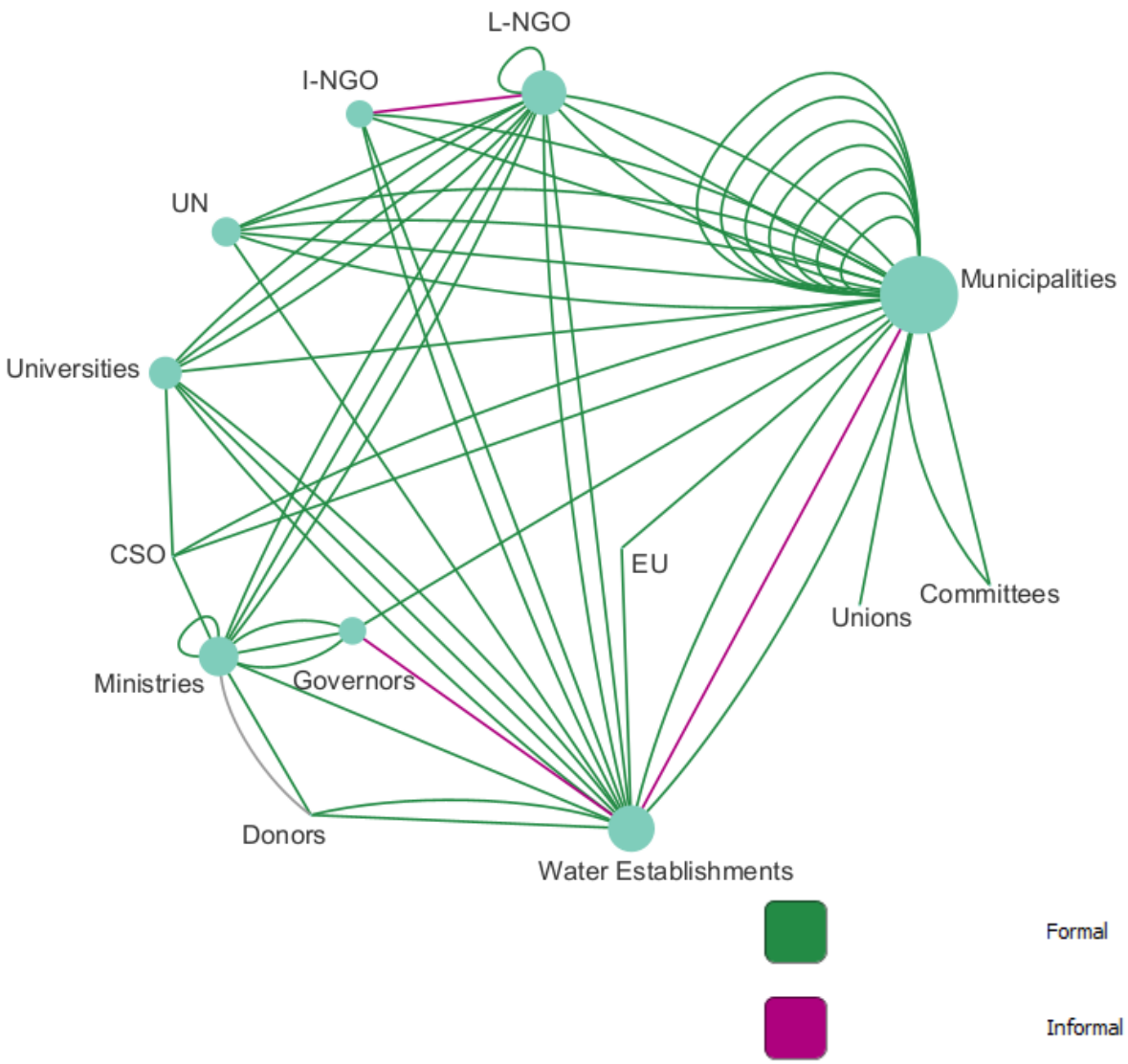




3. What are the relationships between them?

Al Ghadir





3. What are the relationships between them?

Comparing Network Measures-observations

Measures\River Basin	Al Assi	Al Ostuan	Al Ghadir
Network Measures (The higher the better)	Density: 0.47 Clustering: 0.74	Density: 0.47 Clustering: 0.51	Density: 0.33 Clustering: 0.54
Observations (from graph and measures)	- Network well connected (density 0.47) - Actors are closely coupled (clustering 0.74) (forming internal triads) - Multiple links between various local NGOs - Multiple links between various municipalities	- Network well connected (density 0.47) - Actors are loosely coupled (clustering 0.51) - No reported links between municipalities and water establishments	- Network not well connected (density 0.33) - Actors are averagely coupled (clustering 0.54) - Limited links between the committees and unions with other stakeholders - Multiple links between different municipalities

3. What are the relationships between them?

Comparing Network Measures & establish observations

Measures\River Basin	Al Assi	Al Ostuan	Al Ghadir
Interaction Type & Frequency	Formal: 23% Informal: **48%** No Contact: 28% Monthly: 30%	Formal: 24% Informal: **70%** No Contact: 6% Every 3 Months: 23%	Formal: **93%** Informal: 5% No Contact: 2% Daily: 57%
Observations (from graph and measures)	Most interactions were **informal** with communication reported every month	Most interactions were **informal** and reported every ~ 3 **months**.	Interactions were mainly **formal** and most often happening **daily.**

3. What are the relationships between them?

Summary of findings

Al Assi network

- Al Assi network is **well-connected** (density is 47%) with **well grouped actors** (74%).
- The interaction between actors is primarily reported as **informal**, with interactions occurring **almost every month.**

Al Ostuan network

- Al Ostuan is **a well-connected network** with a density of 47%. However, the actors within the network **are not closely grouped** (51%), especially when compared to Al Assi.
- Interactions between actors are predominantly **informal, happening almost every 3 months**, mirroring the pattern observed in Al Assi.
- The network in Al Ostuan highlights an **absence of unions**, and the data reveals **weak relations between municipalities and water establishments** (no recorded interactions).

Al Ghadir network

- In Al Ghadir, network is **not well connected** (density is 33%), and the actors are **averagely grouped** together (54%).
- Interactions are reported as **formal with interactions occurring most-often everyday**.
- The interaction between committees and unions with the rest of the stakeholders, except with municipalities, was not observed.

3. What are the relationships between them? (data, expertise sharing, water quality, natural disaster)

3. What are the relationships between them? (data, expertise sharing, water quality, natural disaster)

Data and expertise sharing, water quality, natural disaster - Measures

1) Data Sharing

Closeness centrality is a measure of how long it will take the information to spread from a given actor to other one in the network. The highest closeness centrality possesses that shortest path to all neighbour actors.

2) Expertise Sharing

Degree centrality (total degree) is a measure of the number of connections an individual has. Popular or more important stakeholder category has higher degree centrality.

3) Water Quality & Network Maintenance

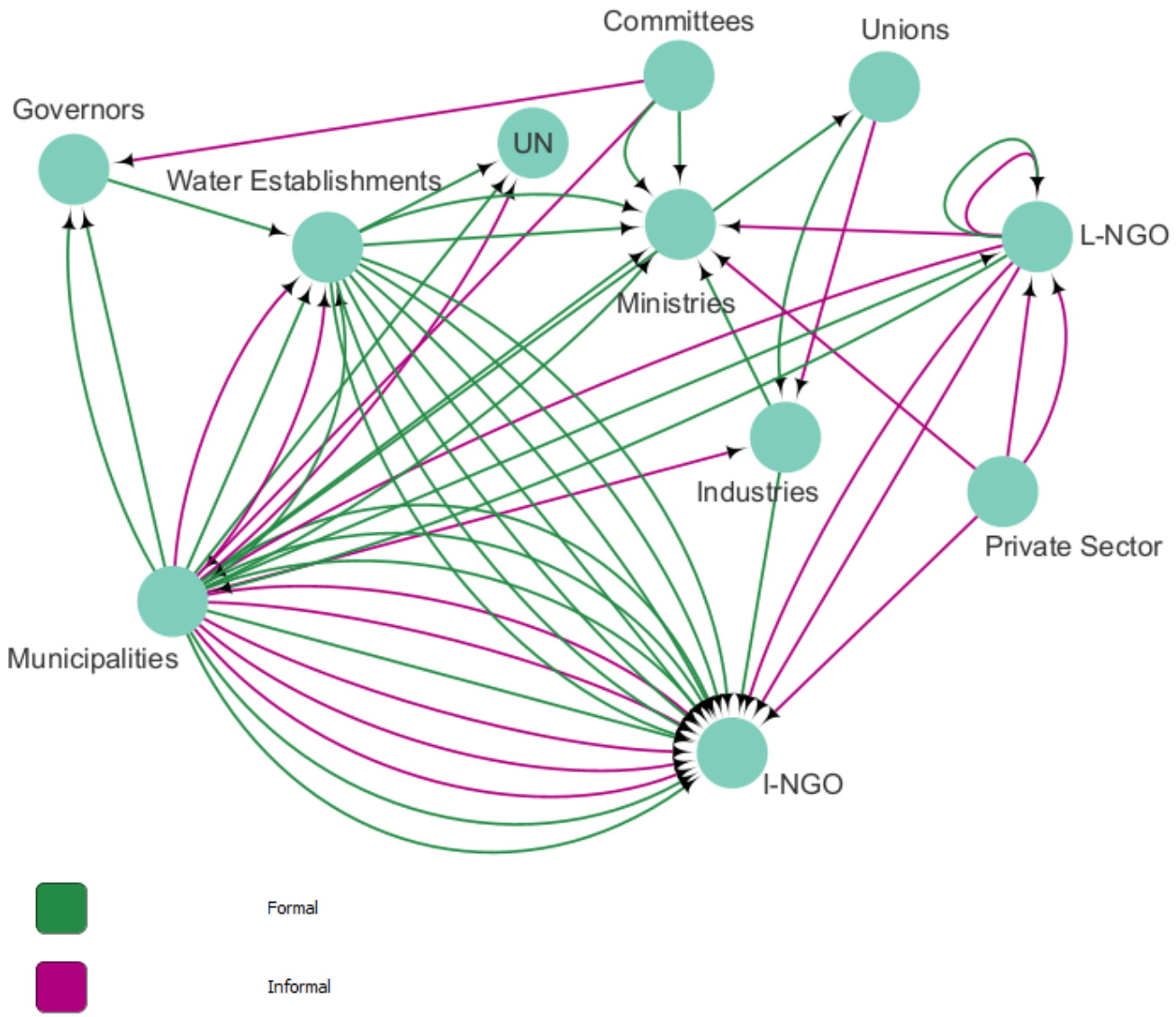
Degree centrality (in-degree) is a measure of the number of connections an individual has. Popular or more important stakeholder category has higher degree centrality.

4) Natural Disaster

Degree centrality (in-degree) is a measure of the number of connections an individual has. Popular or more important stakeholder category has higher degree centrality.

Data sharing

3. What are the relationships between them?
Data & information sharing

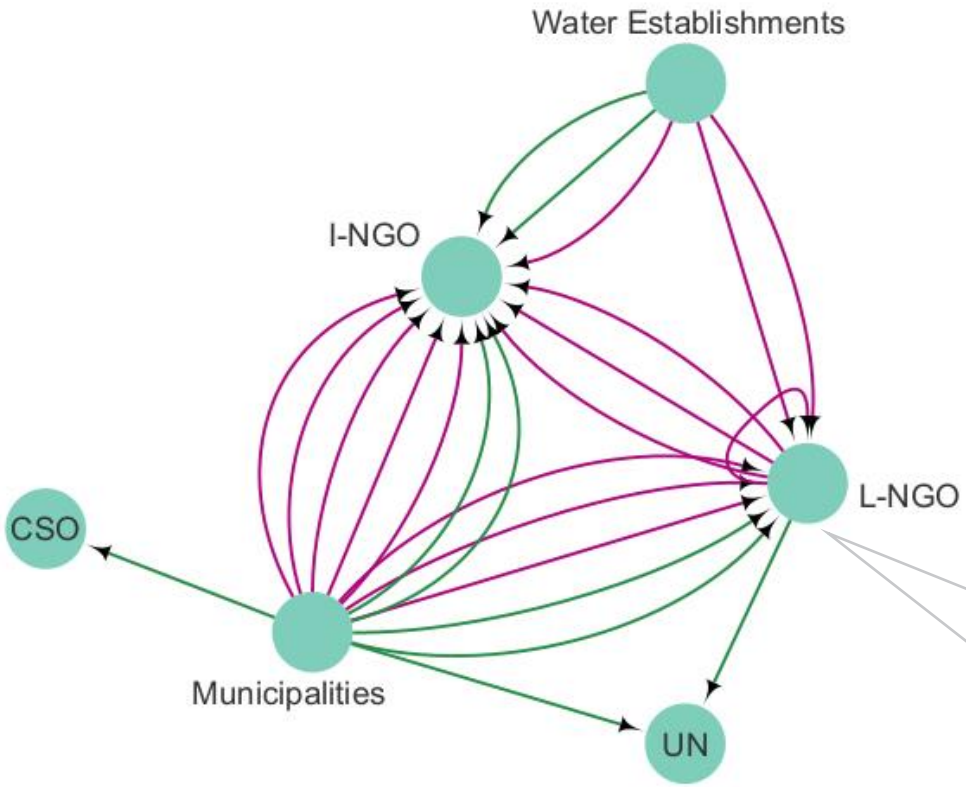


Al Assi

<u>Water Establishments, Municipalities and Industries</u>

- Have the highest closeness centrality value; information disseminated through these actors will be more easily shared with other actors in the network
- These actors are the most closely connected to other actors in the network.
- The Private Sector and committees contribute to data sharing; however, they receive limited data through the network.

3. What are the relationships between them?
Data & information sharing



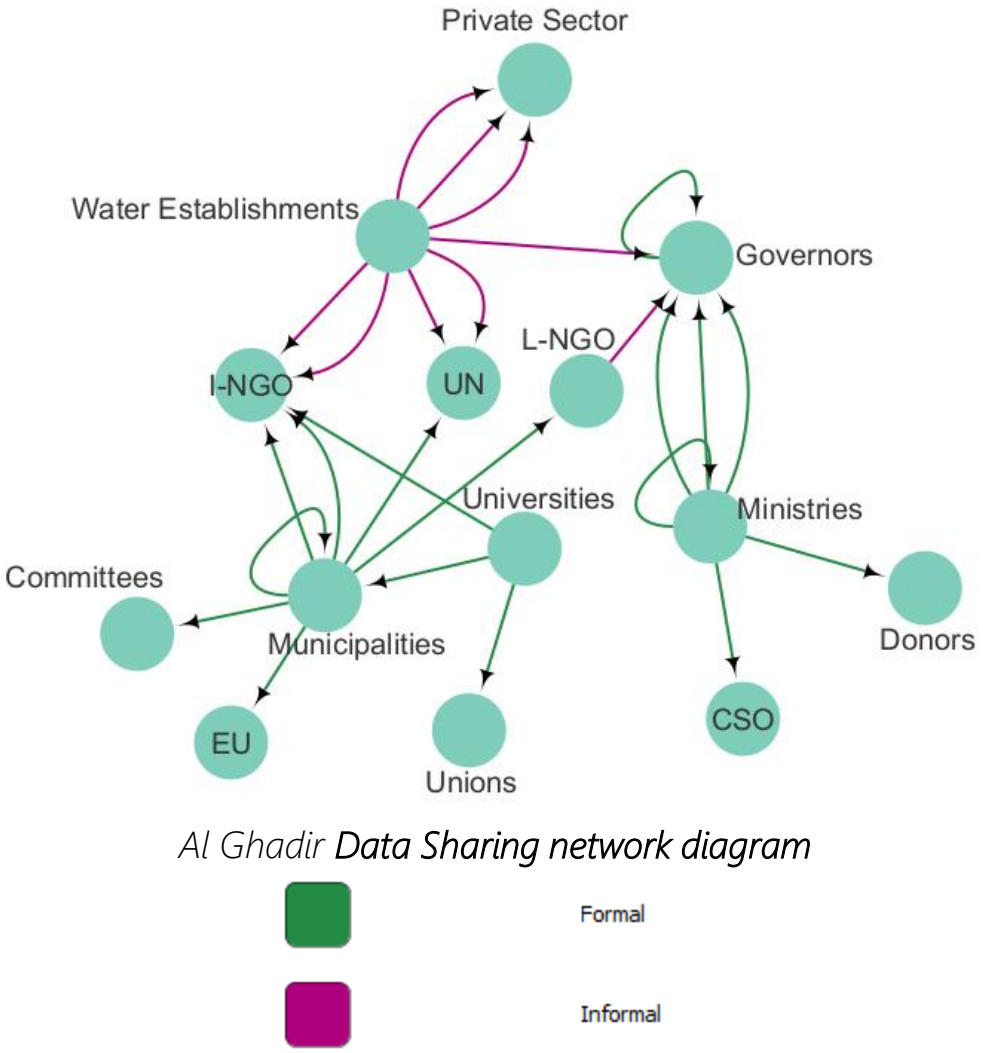
Al Ostuan ***Data Sharing network diagram***

Al-Ostuan

- L-NGO and Municipalities have the highest closeness centrality, indicating that information disseminated through these actors will have a wider coverage over the network. *Closeness centrality measures: LNGO (1.00), Municipalities (1.00), WEs (0.75)*
- Municipalities frequently share data and information with other stakeholders, but they have a limited inflow of information.

```
# Top 3 Closeness Centrality > (top3_cent
<- ranked_Centrality[1:3])
L-NGO Municipalities Water Establishments
1.00   1.00                 0.75
```

3. What are the relationships between them?
Data & information sharing



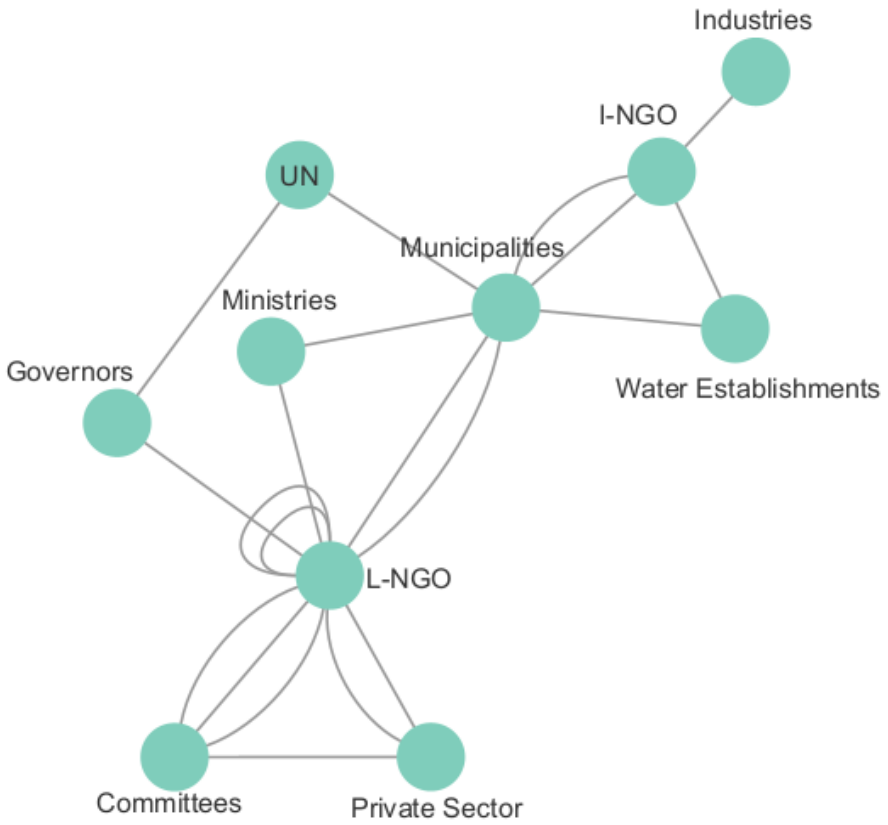
Al Ghadir ***Data Sharing network diagram***

Al Ghadir

- L-NGO, Water Establishments and Ministries tend to have the **highest closeness centrality** value. Information disseminated through those actors has a wider reach across the network.
- A majority of information sharing was happening through formal channels.

Expertise sharing

3. What are the relationships between them?
Expertise sharing



Al Assi ***Expertise Sharing network diagram***

Al Assi

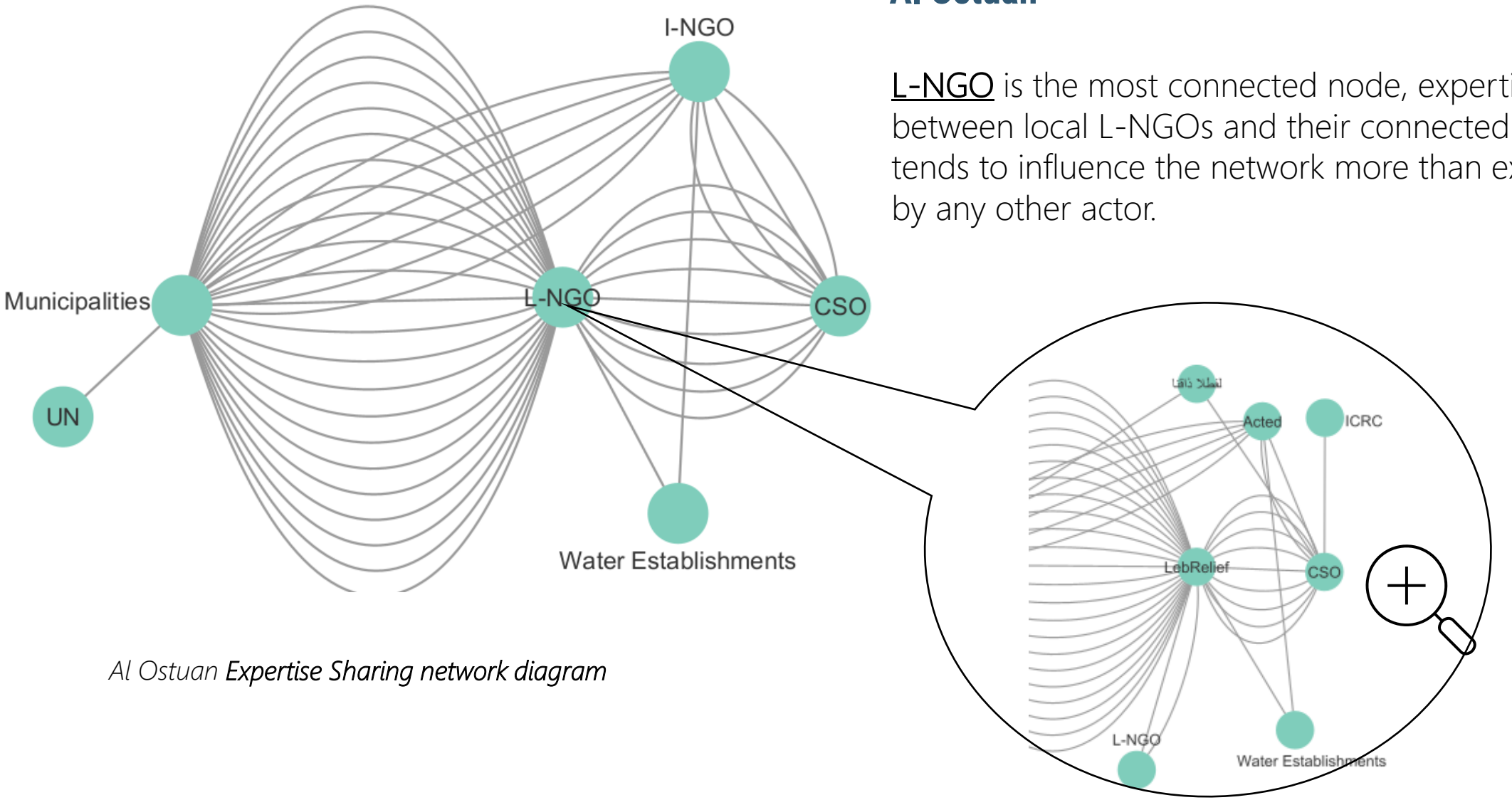
- L-NGOs are the most connected stakeholders; expertise exchange between them and their connected neighbors tends to influence the network more than any other actor.

- Municipalities also play an important role in expertise sharing in the Al Assi basin.

3. What are the relationships between them?
Expertise sharing

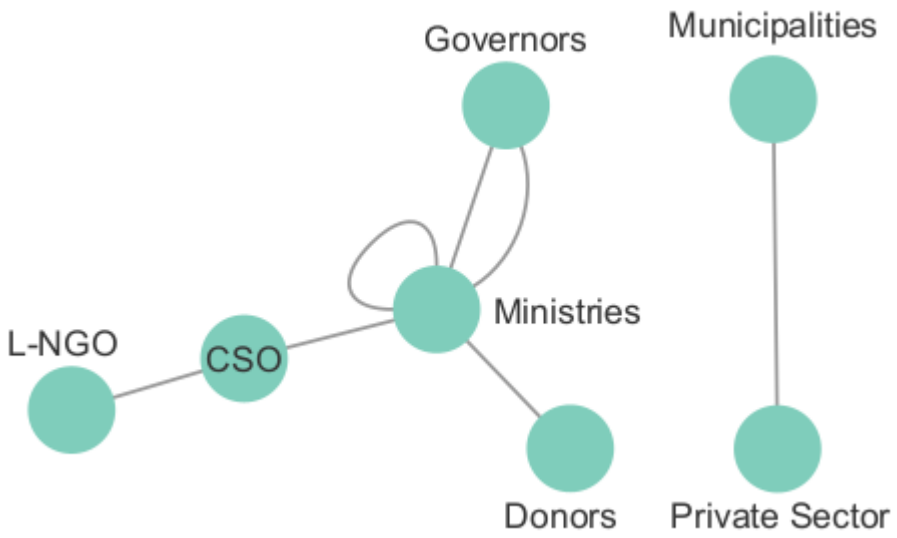
Al Ostuan

L-NGO is the most connected node, expertise exchange between local L-NGOs and their connected neighbours tends to influence the network more than expertise shared by any other actor.



Al Ostuan ***Expertise Sharing network diagram***

3. What are the relationships between them?
Expertise sharing



Al Ghadir ***Expertise Sharing network diagram***

Expertise sharing (in Al Ghadir)

Ministries are the most connected nodes; expertise exchange between ministries and their connected neighbors tends to influence the network more than any other actor.

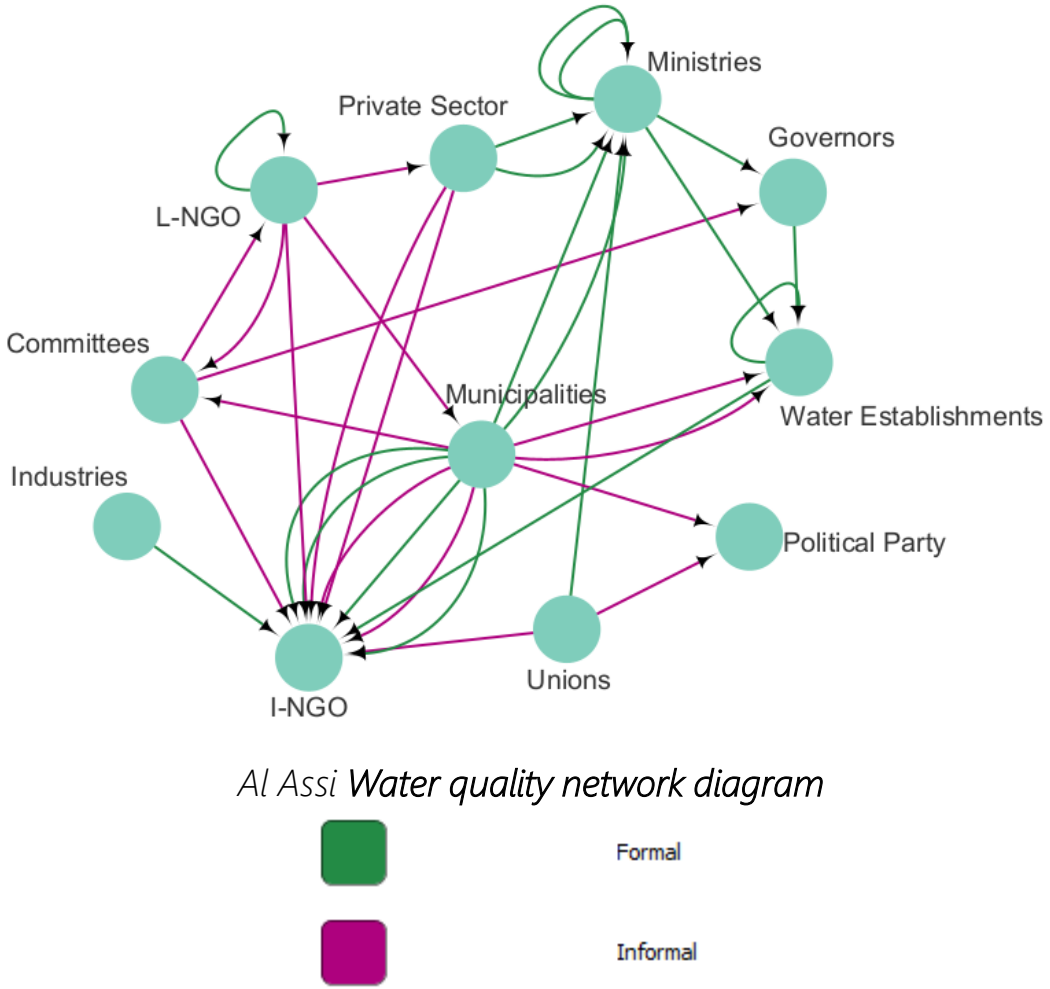
The Al Ghadir network of expertise sharing is fragmented, as municipalities share expertise in a bilateral form with the private sector.

The data does not show any contribution from private sector to the wider network in the field of expertise sharing.

Water quality & network maintenance

3. What are the relationships between them?

Water quality & network maintenance



Al Assi ***Water quality network diagram***

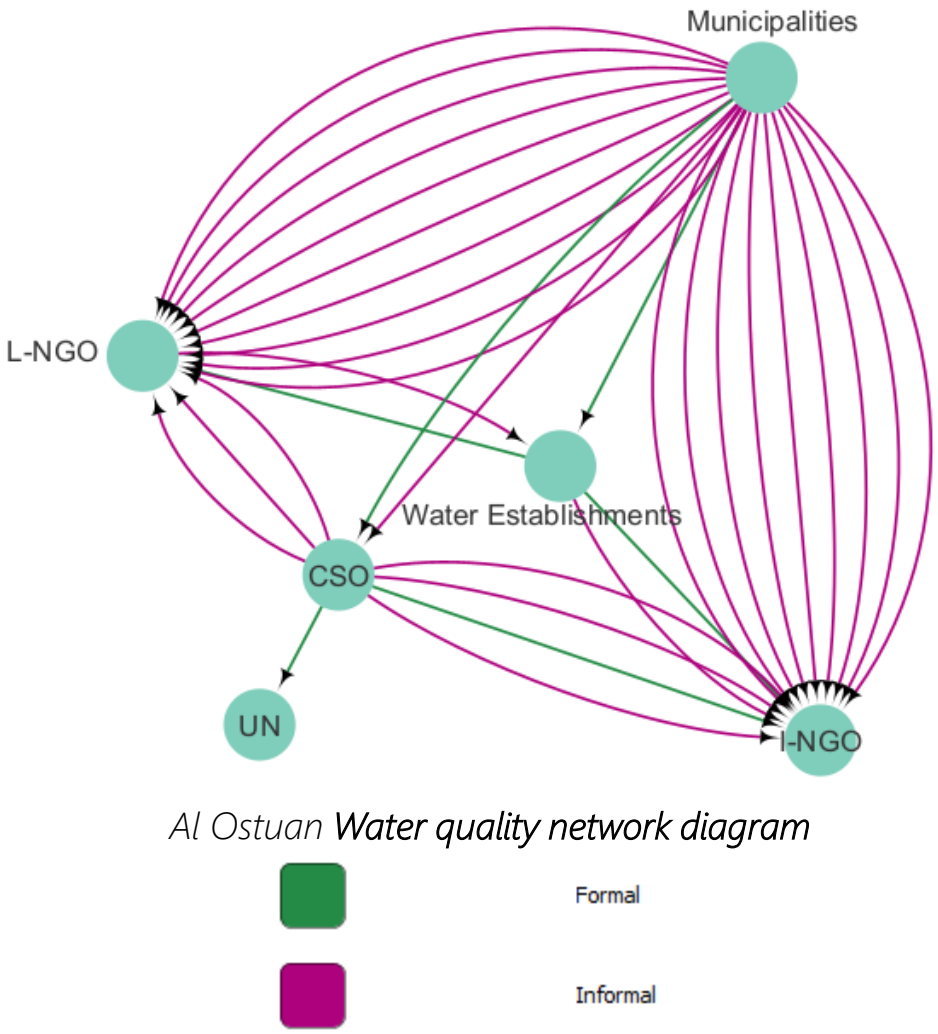
Al Assi

I-NGOs have the highest **degree centrality value** (in-degree), they most often receive communication regarding water quality and network maintenance.

The network shows the coexistence of 2 types of communication (Formal and Informal), with more frequently reported informal lines.

3. What are the relationships between them?

Water quality & network maintenance



Al Ostuan ***Water quality network diagram***

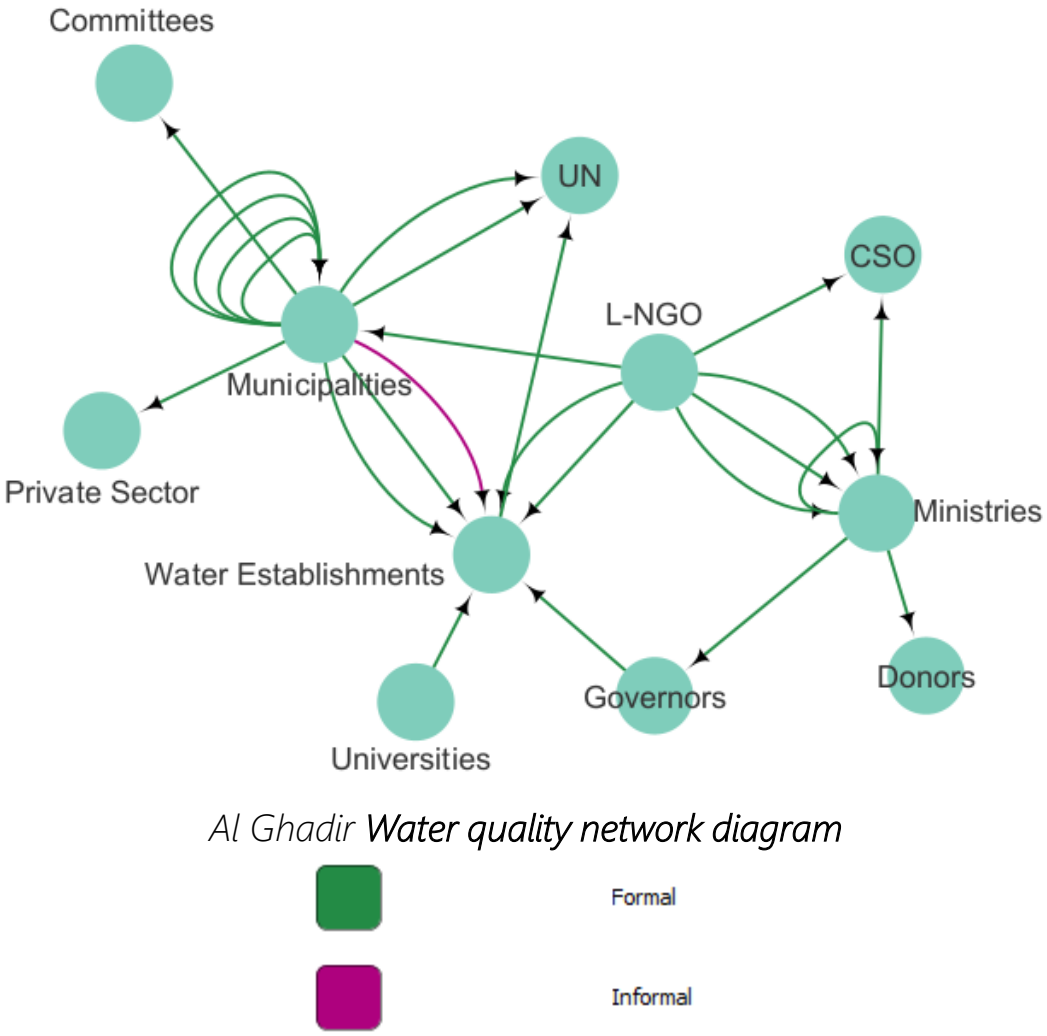
Al Ostuan

I-NGOs (followed closely by L-NGOs) tend to have the highest degree centrality value (in-degree), those actors most often receive communication regarding water quality and network maintenance.

In this small network, communication regarding water quality and network maintenance is primarily informal and is mainly directed towards L-NGOs and I-NGOs.

3. What are the relationships between them?

Water quality & network maintenance



Al Ghadir ***Water quality network diagram***

Al Ghadir

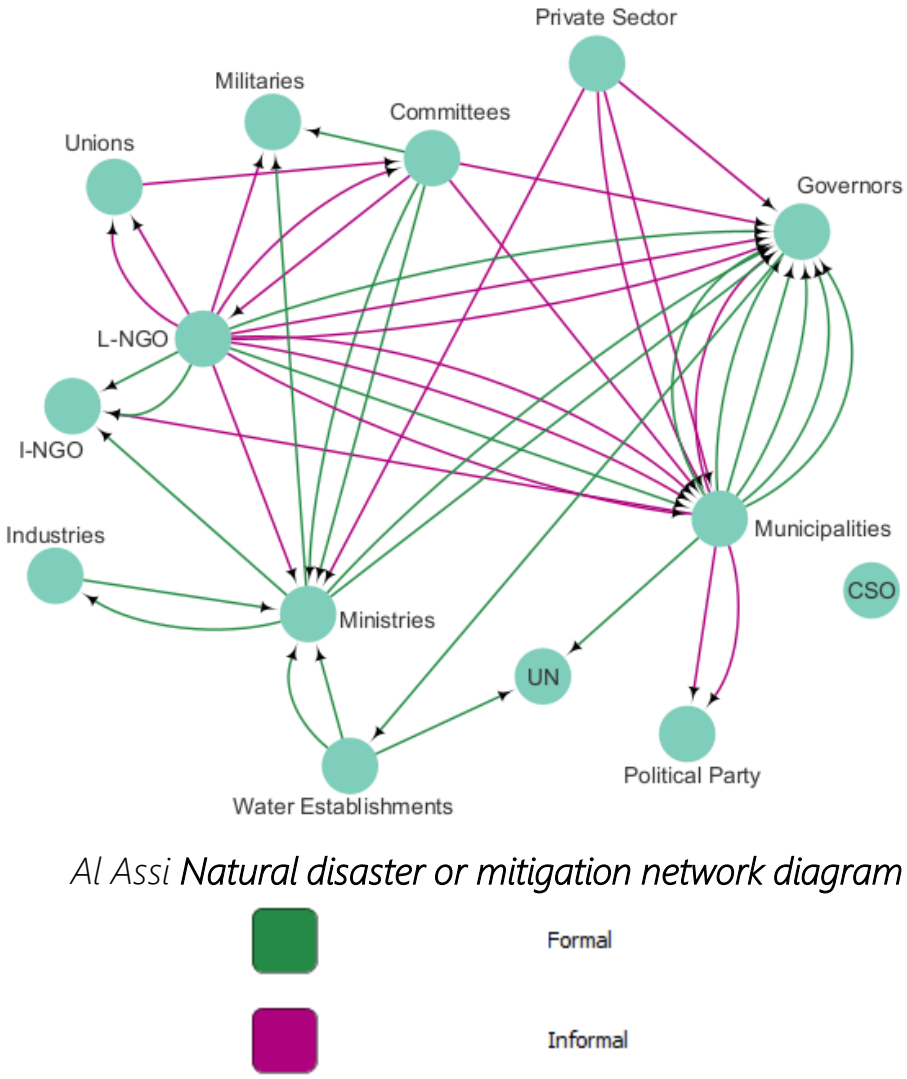
Water Establishments tend to have the highest degree centrality value (in-degree)*, this actor receives the most communication regarding water quality and network maintenance.

The communication on water quality in Al Ghadir is predominantly formal, with frequent internal communication occurring among municipalities.

Natural disaster risks or mitigation (floods, droughts, etc)

3. What are the relationships between them?

Natural disaster risks or mitigation (floods, droughts, etc)



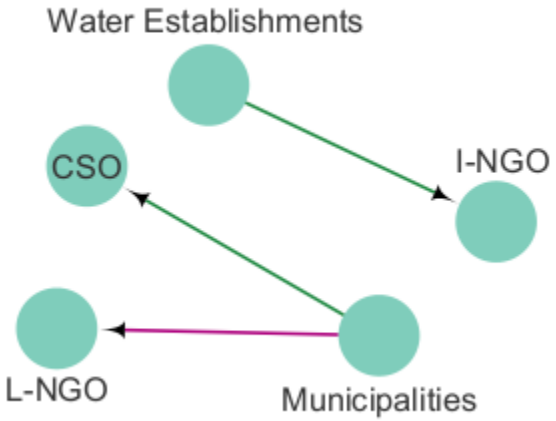
Al Assi ***Natural disaster or mitigation network diagram***

Al Assi

Governors have the highest degree centrality value (in-degree), they play an important role as the point of reference in case of natural disaster or mitigation measures.

3. What are the relationships between them?

Natural disaster risks or mitigation (floods, droughts, etc)



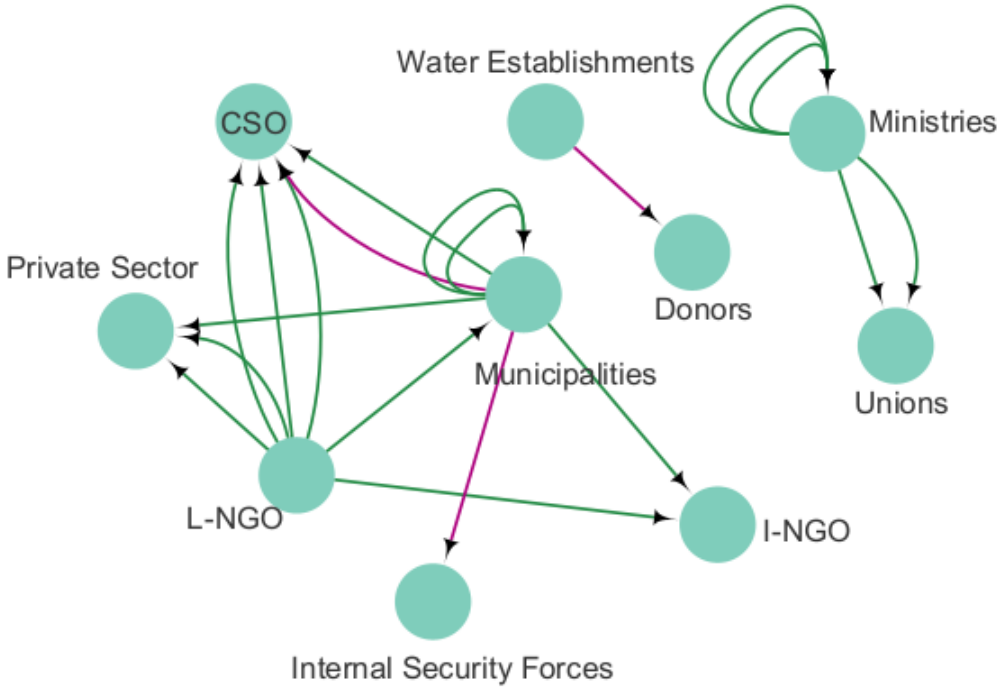
Al Ostuan

Limited responses

Al Ostuan ***Natural disaster or mitigation network***

3. What are the relationships between them?

Natural disaster risks or mitigation (floods, droughts, etc)



Al Ghadir ***Natural disaster or mitigation network***

Natural disaster risks or mitigation (in Al Ghadir)

CSOs and Private Sector tend to have the highest degree centrality value (in-degree), those actors play an important role as a focal point for reference in case of natural disaster or mitigation measures.

We can notice a network disconnection and the bilateral interaction between ministries and unions forming a cluster (group of nodes) by themselves.

Discussion/recommendations

Data and information sharing

Addressed to: Ministry of Energy and Water / Governor / INGOs

- Emphasize the importance of **data sharing** among all River Basin stakeholders, and **establish structured communication channels** (such as regular meetings, workshops, database platforms, newsletters…)
- Establish data **communication channels led by by the WE and municipalities**, regularly updated. These channels would facilitate information access for water users and local committees. For example, the WE department could utilize established communication channels to disseminate water testing results, statistics, or any relevant information. Water fee collection records could be made accessible through an online database platform.
- Highlight the significance of **data dissemination from NGOs to all other stakeholders** (promote thematic information sharing) with respect to water projections, climate change etc. *(general recommendation)*

Expertise sharing

Addressed to: Ministry of Energy and Water / INGOs

- Promote **structured communication channels**, including regular meetings, workshops, database platforms, and newsletters.
- Advocate for **funding key positions within the staff pool** and activate proper accountability and supervision.
- Encourage **collaboration between LNGOs & Municipalities with WE**. This collaboration should focus on capacity building for WE staff, technology integration, and the establishment of a feedback mechanism
- Support the **involvement of LNGO's, with expertise in the field of operations**, in discussions with ministries.

Water quality & network maintenance

Addressed to: Water Establishments (WE)

- Activate the customers complaints and feedback system within the maintenance and distribution sections.
- Support water testing and network maintenance assets, including assets management, inventory balance, and depreciation
- Establish a coordination mechanism to support the WE's in updating the existing data on the network (comprehensive ground truthing exercise)
- Advocating for clearly structured and documented **roles and responsibilities** of relationships between WE's, municipalities and NGO's

Addressed to: Ministry of Energy and Water / Governor / INGOs

- Establish structured communication channels, advocate for the implementation of **laws and regulations** that mandate formal communication.
- In the future SNA, explore municipalities' perspectives on the potential inclusion of a WE office within their facilities

Natural disaster risks or mitigation

Address to: Ministry of Energy and Water / Governor

- Establish structured communication channels, including the involvement of LNGOs and Municipalities in resources allocation, community engagement
- Increase preparedness for WE through awareness building and risk assessments on potential natural disasters in different river basins

4. Are there tensions between stakeholders in their roles, on paper or in practice?

4. Are there tensions between stakeholders in their roles, on paper or in practice?

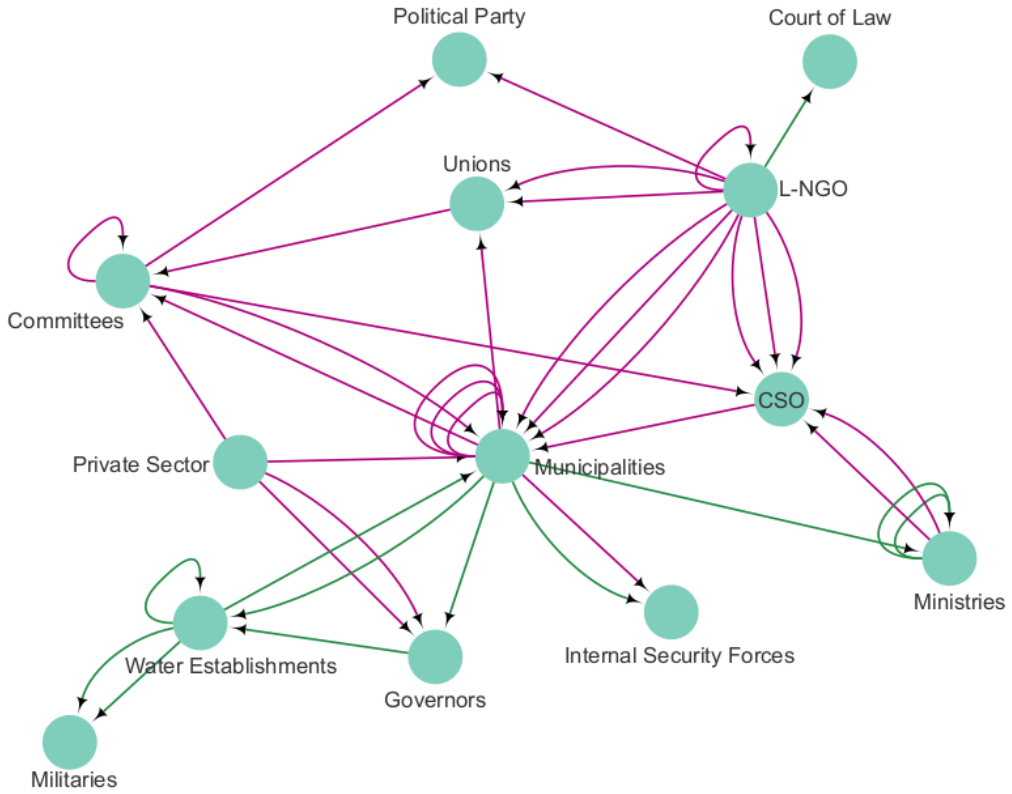
Water-related conflicts

Betweenness centrality is a measure used to identify the level of influence a stakeholder category has over the flow of information in a network. It is often used to find the player that acts as a bridge, facilitating the shortest path between different parts of the network.

Note:

The data captured information on communication related to conflict, not on conflict resolution mechanisms.

4. Are there tensions between stakeholders in their roles, on paper or in practice?

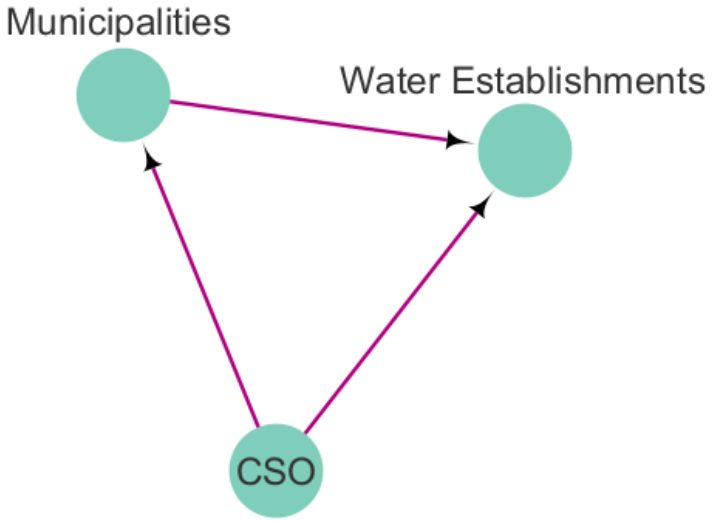


Al Assi ***Conflict resolution network diagram***

Conflict management (in Al Assi)

- Most communication related to conflict was directed to <u>municipalities, through informal channels.</u>
- Formal channels are used to communicate with legal entities (such as court of laws or internal security forces).

4. Are there tensions between stakeholders in their roles, on paper or in practice?

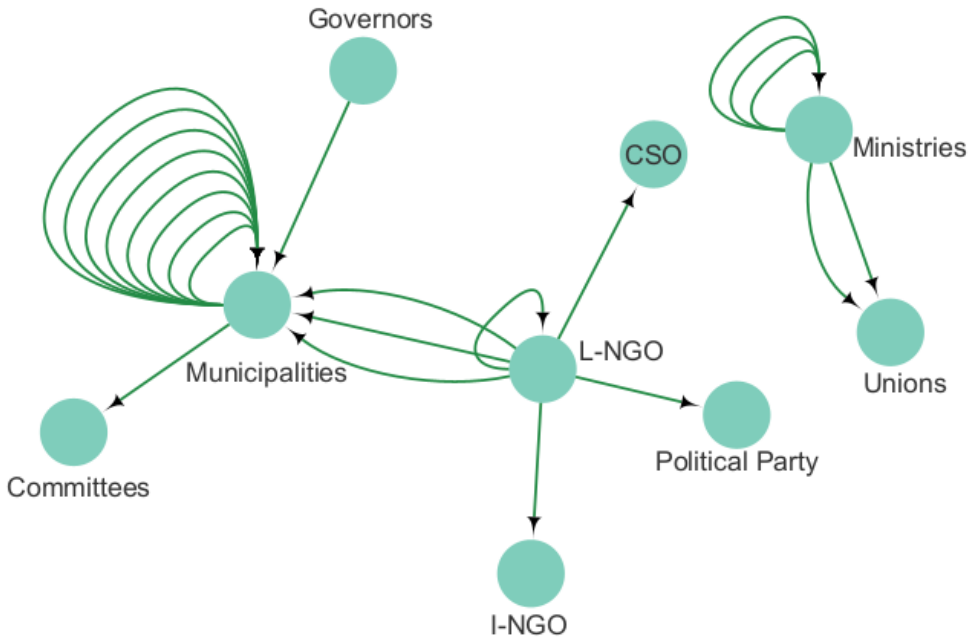


Al Ostuan ***Conflict resolution network diagram***

Conflict management (in Al Ostuan)

⚠ Limited responses

4. Are there tensions between stakeholders in their roles, on paper or in practice?



Al Ghadir ***Conflict resolution network diagram***

Conflict management (in Al Ghadir)

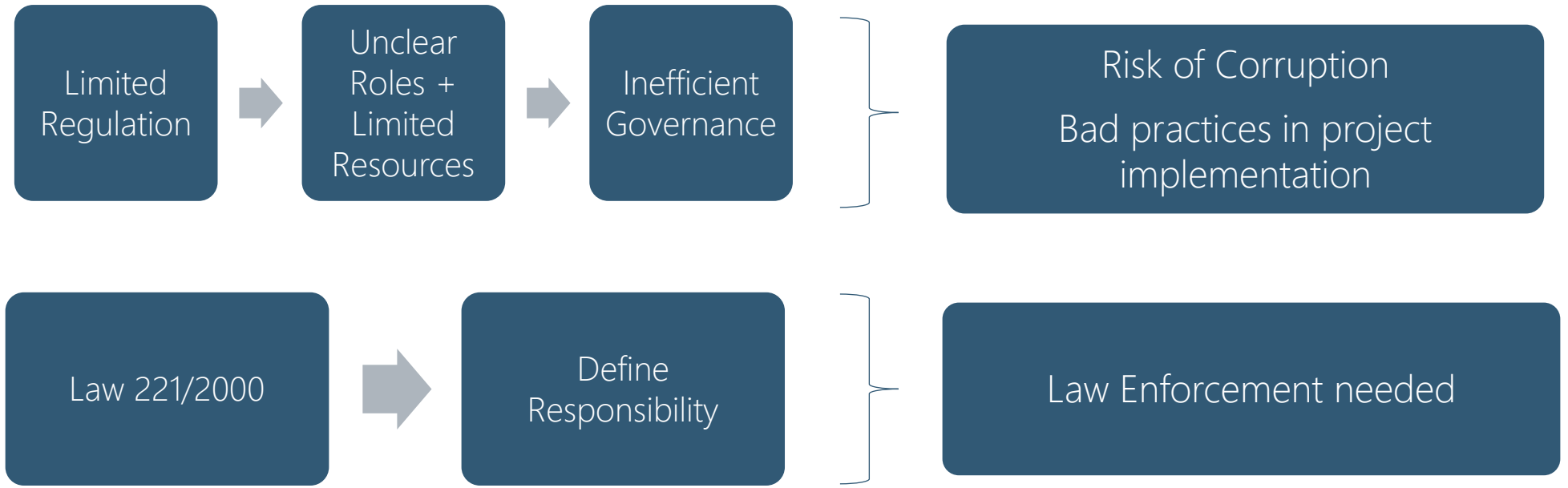
Municipalities play a central role in the communication regarding water-related conflicts.

Channels of communication are predominantly formal.

The network depicts a disconnected relation between ministries and unions that were reported to have bilateral communication, not associated with other water management actors in the area.

Discussion

Findings from the qualitative analysis and secondary data review



- Conflict and Political tension can be solved by creating partnership in water projects (e.g., solar farms …)

Discussion / Recommendation

Conflict management

Address to: Ministry of Interior / Municipalities / Governor

- Emphasizing the role of municipalities (by the mean of WE office) in receiving conflict notifications and directing them through formal resolutions channels (legal forms to internal security forces)
- While the role of the municipalities in conflict resolution related to water grievances is limited, they are positioned accountable for ensuring the overall resolution of reported conflicts

Address to: INGO

- Conducting in depth comprehensive SNA studies that focuses on Conflict Management (type of conflict, resolution process, frequency of recurrence, conflict focal point …) within Assi River Basin
- More awareness sessions for water actors about communication lines, feedback and complains

5. Who are the main stakeholders (influence, network, persuasive/institutional power, centralized position) to target when implementing sustainable river basin management plans?

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Key Player- measures:

Key Player (approach 1: *with respect to other stakeholders*)

Authority score is the relative importance of a node in a network. The higher the score, the more assumed weight a node's outbound links to another node could have.

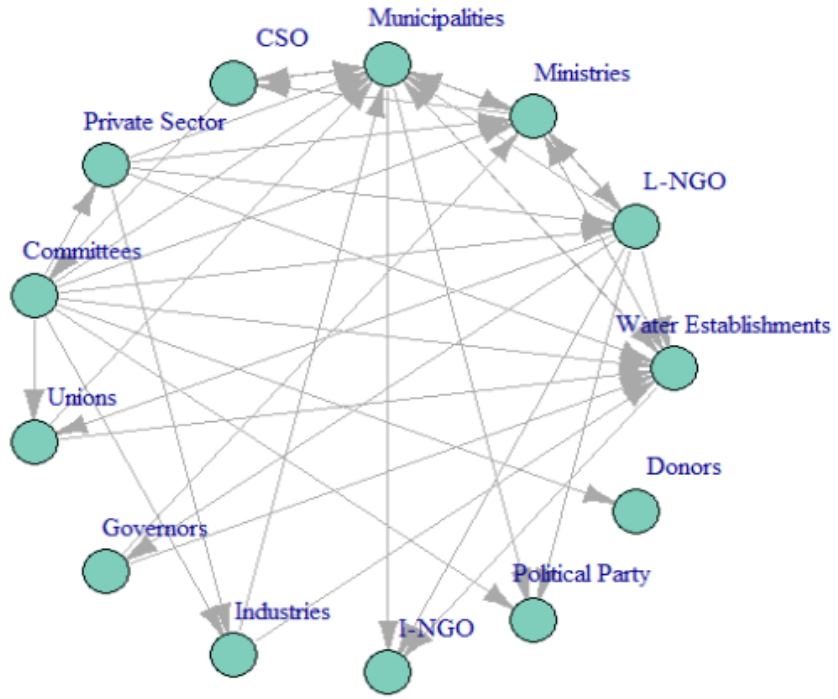
Key Player (approach 2: *with respect to established relationships of stakeholders*)

Page rank measures the importance of each node within the graph, based on the number incoming relationships and the importance of the corresponding source nodes.

5. Who are the main stakeholders (influence, network, persuasive/institutional power, centralized position) to target when implementing sustainable river basin management plans?

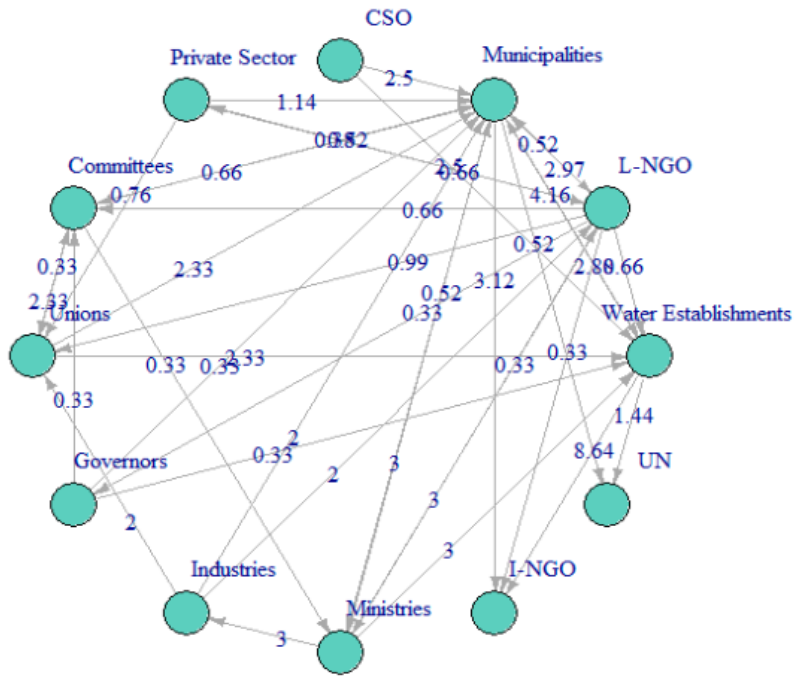
Key Player (in Al Assi)

Key Player (approach 1)



Water Establishments were recognized as key players due to their responsibility for water distribution and fee collection. They were reported to be at the forefront of water management in the area, and their authority was acknowledged for the implementation of any new water projects.

Key Player (approach 2)

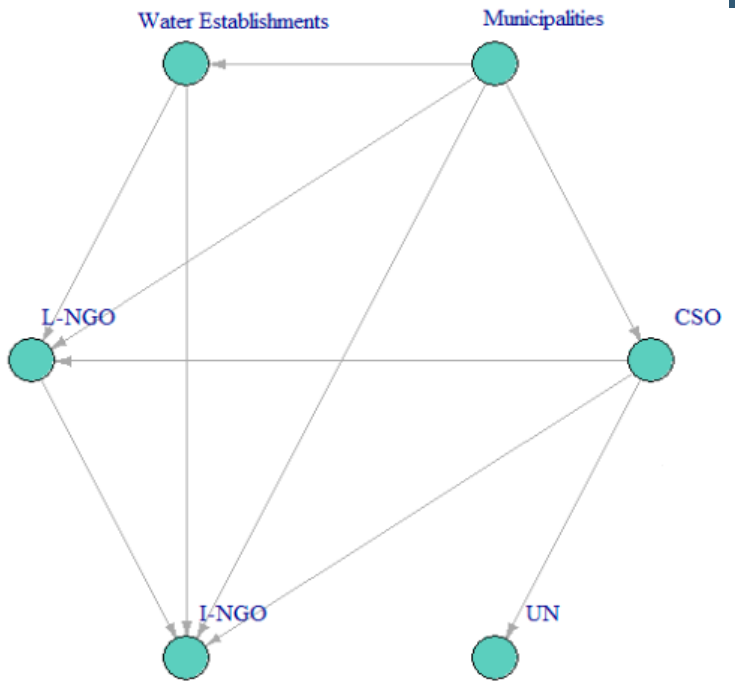


Using approach 2, **Municipalities** were identified as key players in Al Assi. Their key roles include enforcing water project implementation, monitoring operations and distribution, and ensuring quality control. Additionally, they are seen as effective coordinators with other stakeholders, supporting the water management system in the area.

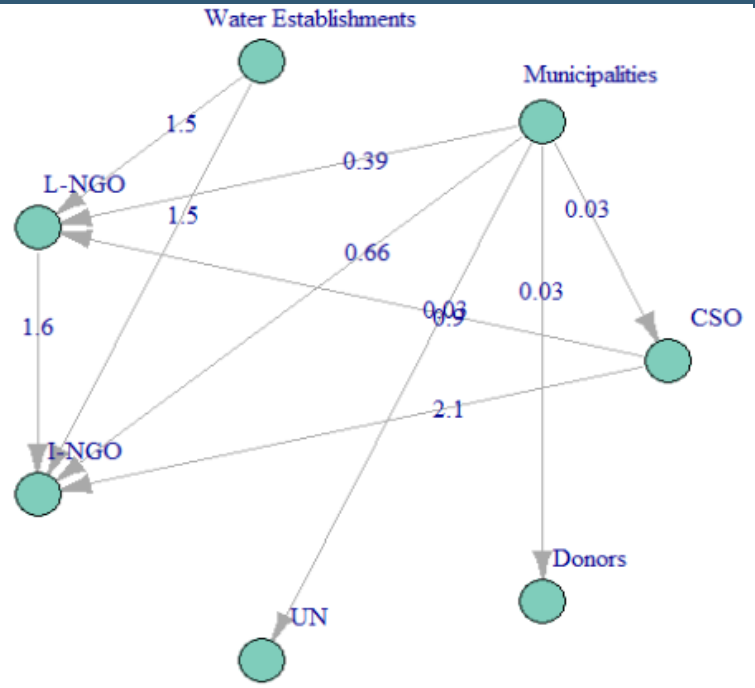
5. Who are the main stakeholders (influence, network, persuasive/institutional power, centralized position) to target when implementing sustainable river basin management plans?

Key Player (in Al Ostuan)

Key Player (approach 1)



Key Player (approach 2)

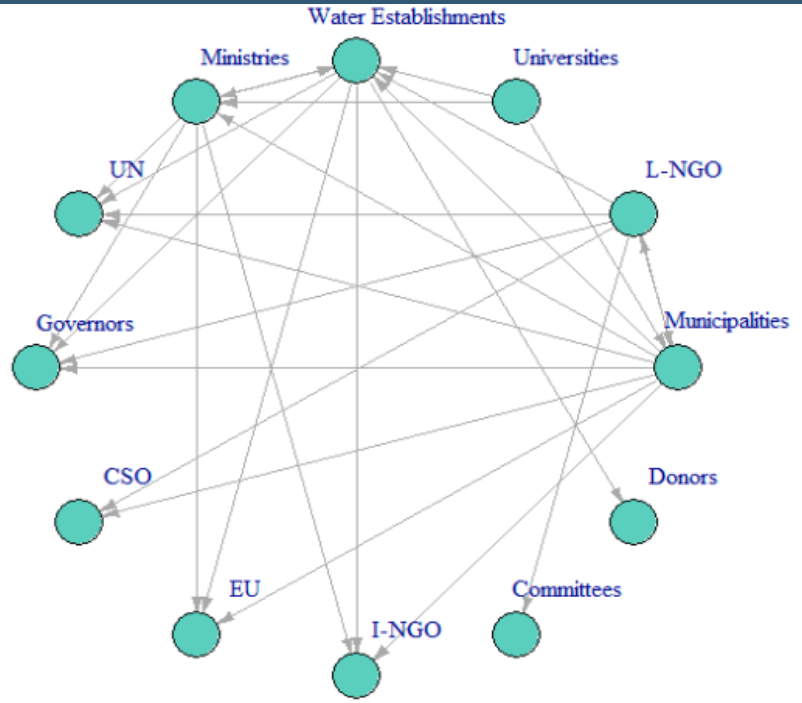


I-NGOs (followed by L-NGOs) were identified as central figures in Al Ostuan due to their strong funding, capacity building in water management, and expertise in grant proposal writing. Their significance is reinforced by their active involvement in training, awareness campaigns, coordination with partners, seminars, and engagement with municipalities. Moreover, their work in reducing pollution in the river basin was acknowledged by stakeholders.

5. Who are the main stakeholders (influence, network, persuasive/institutional power, centralized position) to target when implementing sustainable river basin management plans?

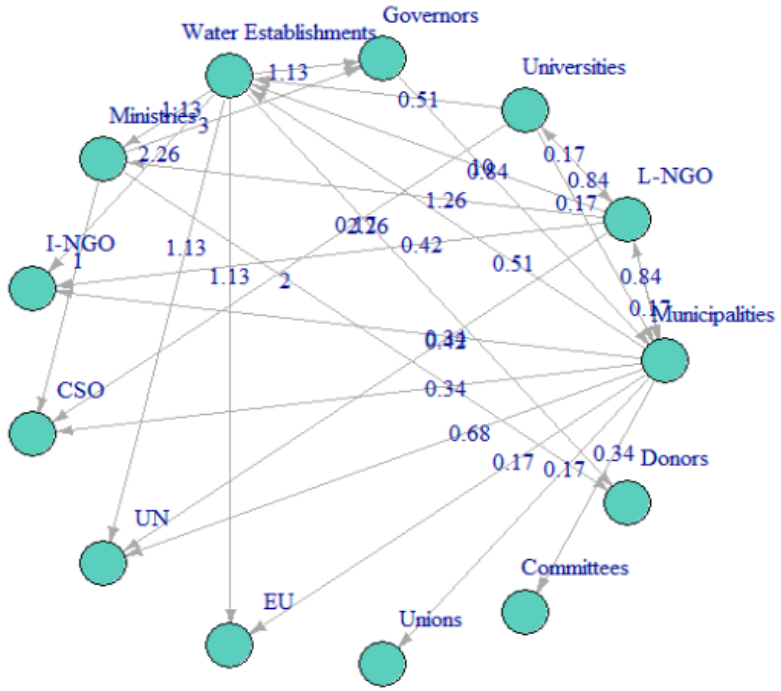
Key Player (in Al Ghadir)

Key Player (approach 1)



The UN and governors were identified as key players in Al Ghadir, attributed to their efforts in improving water quality, network infrastructure, and active involvement in the region.

Key Player (approach 2)



Using approach 2, **municipalities** were identified as key players in this area. Although the assessment did not provide sufficient information about their perceived role, it was reported that there are frequent daily interactions through formal channels between municipalities regarding water management in this region.

6. What do you view as the top three biggest challenges with regards to the water resource management currently?

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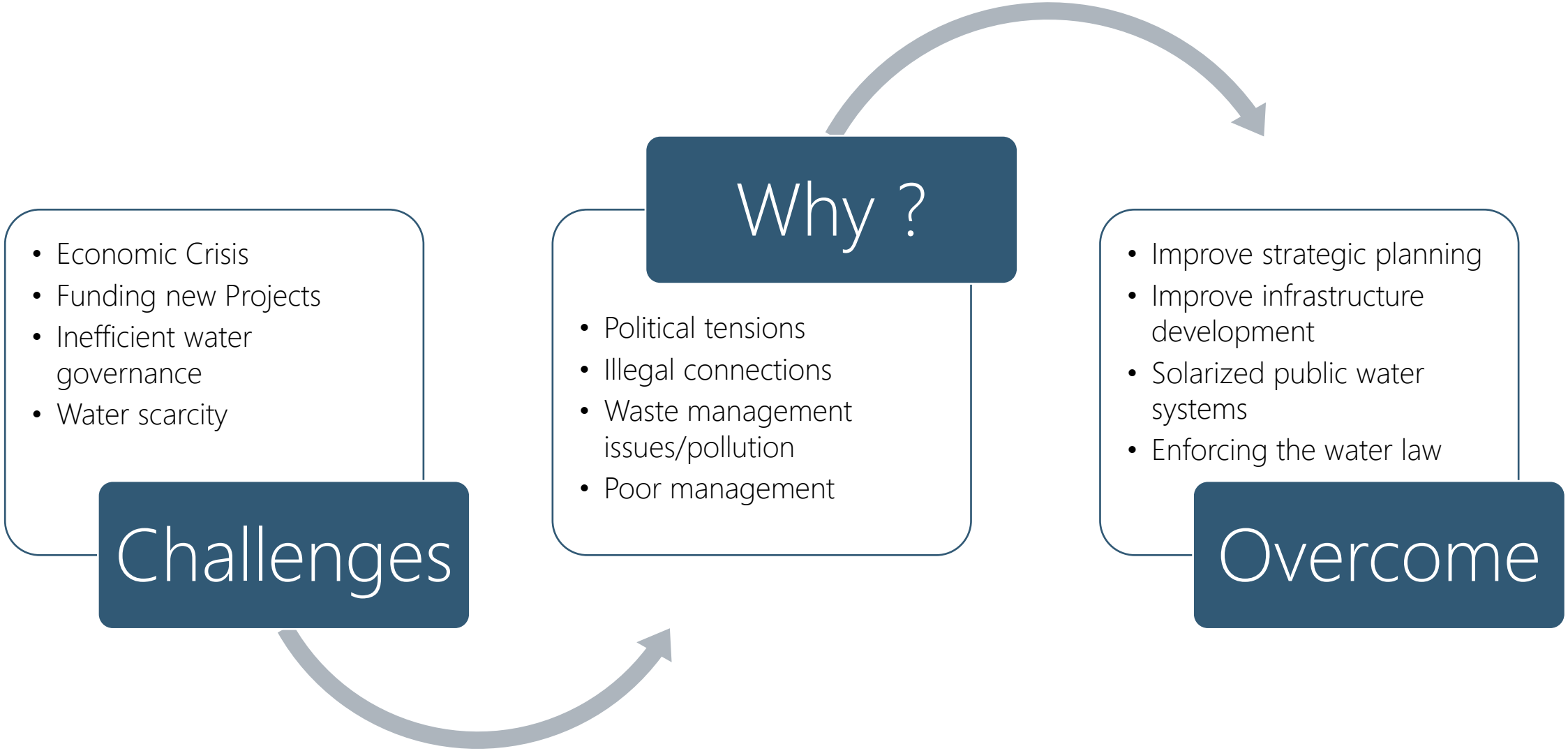
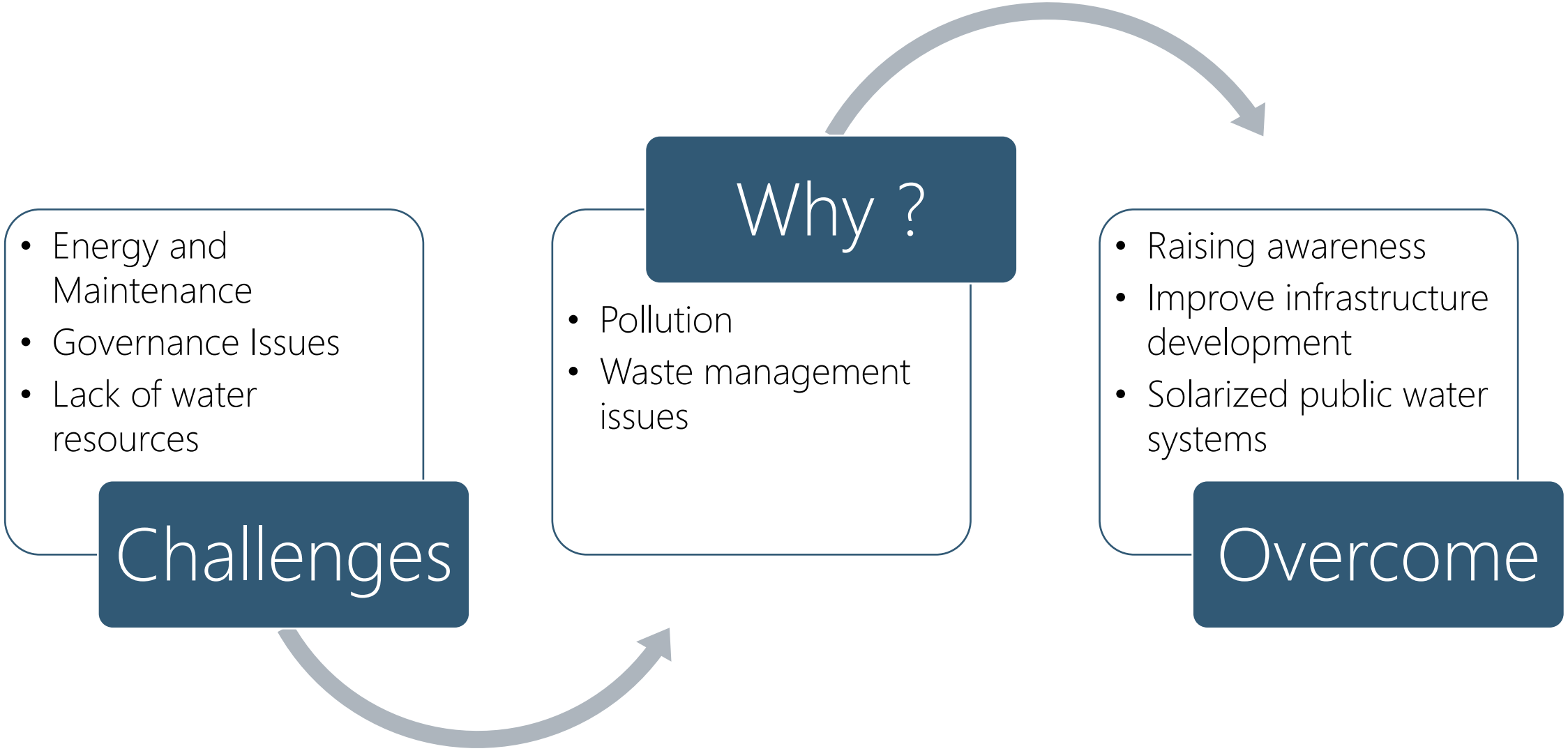
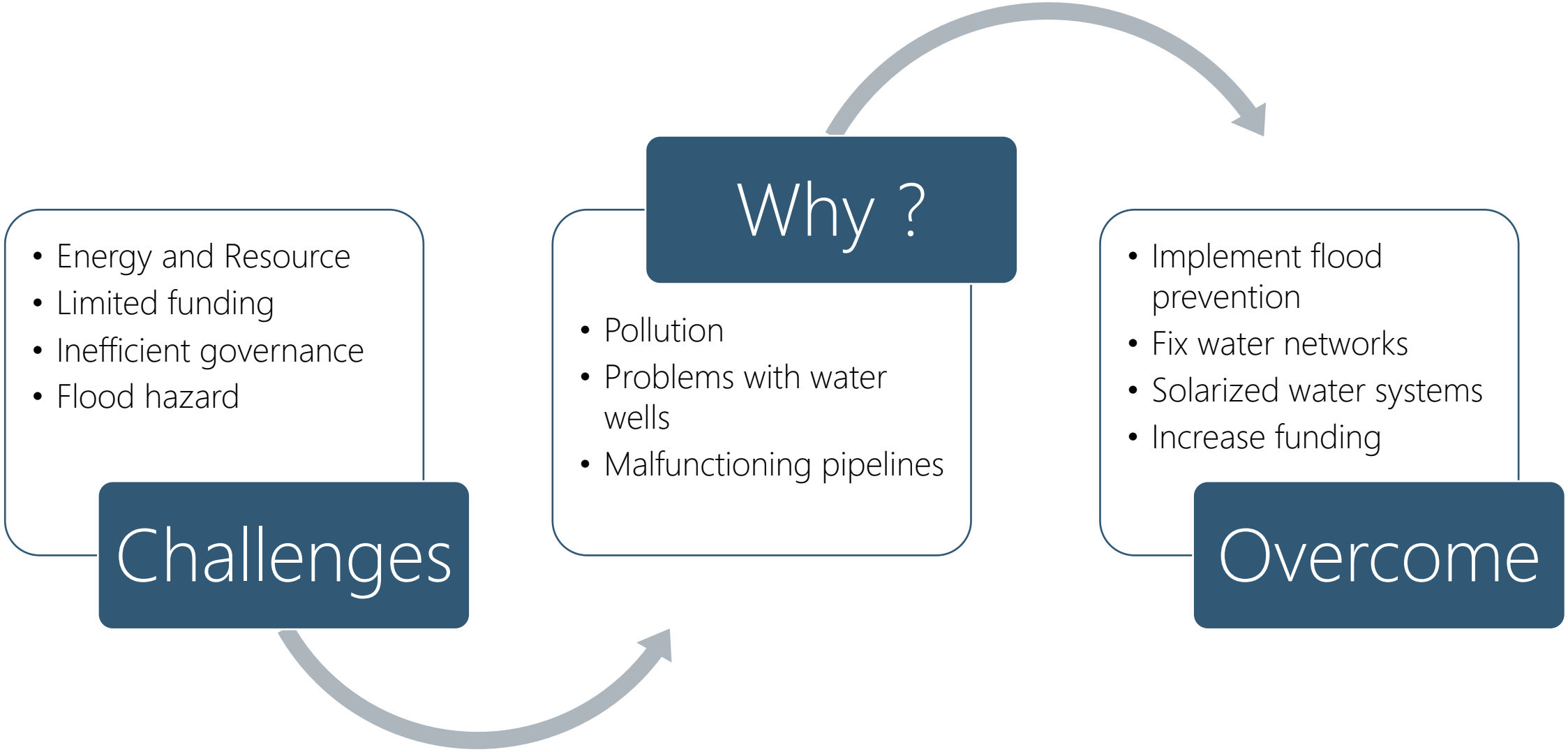
(Al Assi)



6. What do you view as the top three biggest challenges with regards to the water resource management currently?
(Al Ostuan)



6. What do you view as the top three biggest challenges with regards to the water resource management currently?
(Al Ghadir)



Thank you for your attention

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