WATER TRUCKING AND DESLUDGING MARKET STUDY

Presentation to MoEW and WE DGs

Beirut – March 2020

STRUCTURE OF THE PRESENTATION

- **INTRODUCTION**
- **GENERAL DYNAMICS OF WASH SERVICES TO ITSs**
- **LEBANESE PUBLIC INSTITUTIONS ADDRESSING WASH ISSUES AND ITSs**
- **STRENGTHS AND VULNERABILITIES OF STAKEHOLDERS OF WATER AND DESLUDGING MARKETS**
- **CONCLUSIONS AND RECOMMENDATIONS**

INTRODUCTION

Context and Aim of the Study

Context

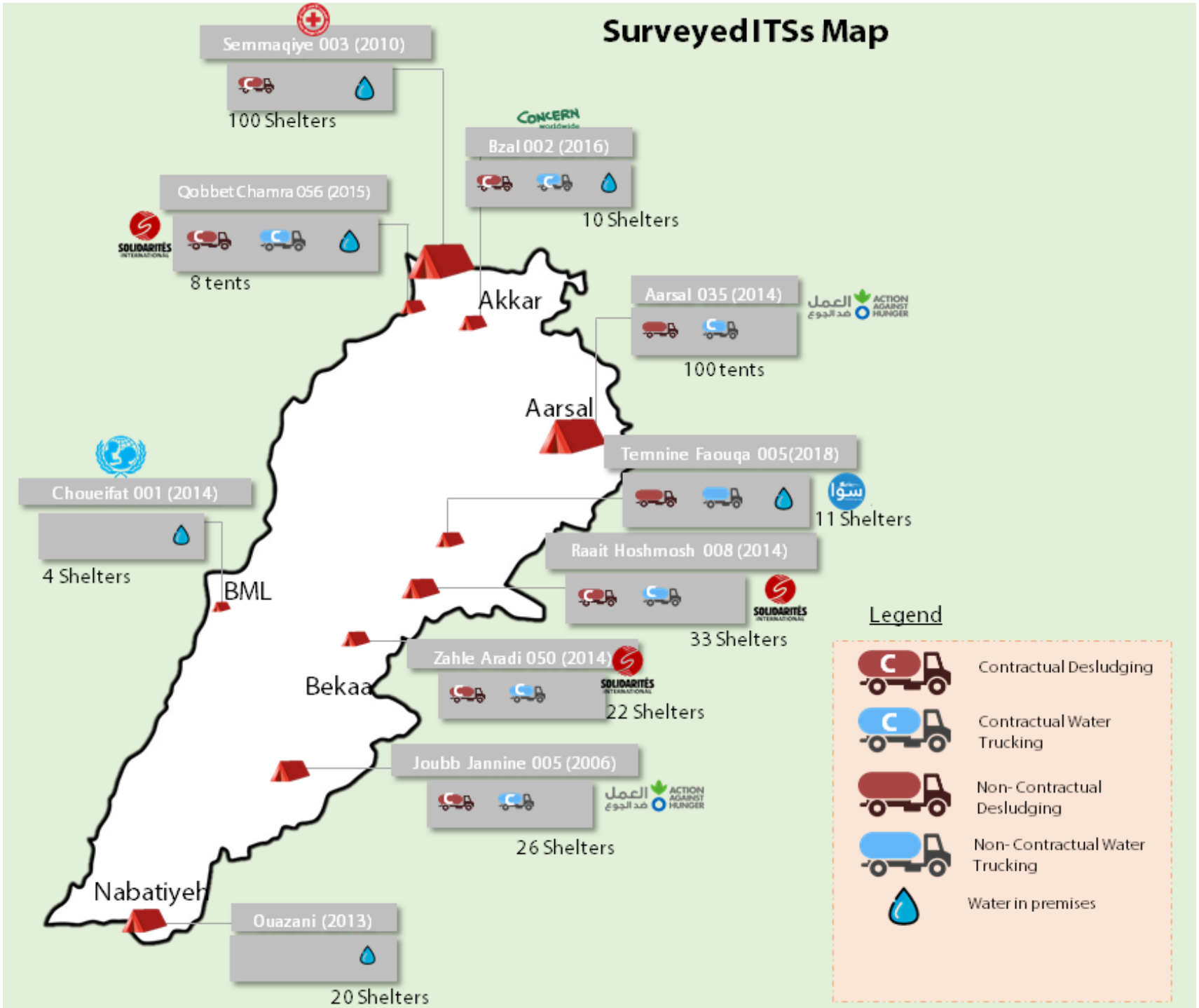
- Issues of public water network delivery (coverage, continuity of flow, leakages, etc.)
- High costs of alternative water provision sources (307M USD – before the Syrian crisis)
- Only around 18% of the wastewater treated (8% ten years ago)
- Desludging tanks are common in suburban and rural areas
- Development of the water and desludging trucking services and their markets since the Syrian displacement crisis

Aim of the study

- No comprehensive studies as to these markets
- Possible reductions in funding raise questions as to the sustainability of mainstream model of WASH provision to ITSs
- ***The objective of this study is to gain a better understanding of the water trucking and desludging markets and their respective value chain to support programming for the provision of water supply and desludging services to vulnerable communities.***

Market Study Strategy and Methodology

KNOWLEDGE TARGETS	METHODLOGICAL STEPS	
1 Synthesis of of the overall context	Review of grey literature	1
2 Grasping differentiated dynamics and impacts of local situations	Review and analysis of WAP (Jan 2019) items	2
	Review and analysis of “truckers’ list” database (2018) produced by some WASH partners	1
	Review and analysis of Water Sector data (2017) produced by WASH partners	1, 2
3 Understanding the vulnerabilities and opportunities of WASH delivery markets in ITSs for different stakeholders: ITS dwellers, truckers, humanitarian agencies, local authorities, centralized authorities	Interviews of informants regarding general dynamics of the trucking markets regionally	1, 3, 4
	Interviews with institutional actors	1, 4
	Case study analysis (interviews, focus group, observation, etc.)	2, 3
4 Conceiving a decision making tree for humanitarian agencies	Transversal analysis	3, 4


Surveyed ITSs Map
Semmaqiye 003 (2010)
100 Shelters
Bzal 002 (2016)
10 Shelters
Qobbet Chamra 056 (2015)
8 tents
Akkar
Aarsal 035 (2014)
100 tents
Aarsal
Temnine Faouqa 005(2018)
11 Shelters
Choueifat 001 (2014)
4 Shelters
BML
Raait Hoshmosh 008 (2014)
33 Shelters
Zahle Aradi 050 (2014)
22 Shelters
Bekaa
Joubb Jannine 005 (2006)
26 Shelters
Nabatiyeh
Ouazani (2013)
20 Shelters
Legend
Contractual Desludging
Contractual Water Trucking
Non- Contractual Desludging
Non- Contractual Water Trucking
Water in premises

Considering opportunities and limitations of 3 alternative scenarios

- Scenario 1: *Favouring and mainstreaming **C4W** and **Voucher Model***

- Scenario 2: *Supporting **water establishments** in regulating/ controlling this market*

- Scenario 3: *Empowering **municipalities** to become trucking services' providers*

I. WASH DELIVERY TO ITSs: THE OVERALL SITUATION

WASH Services in ITSs: A panoramic view

ITS population

	number of ITS	total population	% ITS	% population
occupied ITS	4783	370986	100	100
ITS with ≥ 4 shelters	2907	346047	61	93
Aakar	*657*	*43516*	*23*	*13*
Baalbeck	*917*	*95689*	*32*	*28*
Hermel	*43*	*2355*	*1*	*0,7*
West Bekaa	*254*	*95986*	*9*	*28*
Zahle	*699*	*88875*	*24*	*26*

(based on Jan 2019 WAP data)

Water Trucking paid by NGOs

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters serviced by NGOs	**1186**	**229547**	**41**	**66**
occupied ITS with ≥ 4 shelters serviced by NGOs as a primary source	1065	213253	37	62
occupied ITS with ≥ 4 shelters serviced by NGOs as a secondary source	121	16294	4	5

(based on Jan 2019 WAP data)

Water Trucking paid by dwellers

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters water trucking paid by dwellers	**831**	**98578**	**29**	**28**
occupied ITS with ≥ 4 shelters water trucking paid by dwellers as a primary source	380	32033	13	9
occupied ITS with ≥ 4 shelters water trucking paid by dwellers as a secondary source	451	66545	16	19
occupied ITS with ≥ 4 shelters serviced by NGO as primary source and extra water trucking paid by dwellers	304	3360	29*	2*

(based on Jan 2019 WAP data)

ITS with boreholes

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters with borehole	**1478**	**131642**	**51**	**38**
occupied ITS with ≥ 4 shelters with borehole as a primary source	1139	83727	39	24
occupied ITS with ≥ 4 shelters with borehole as a secondary source	339	47915	12	14
occupied ITS with ≥ 4 shelters with unprotected boreholes	137	20313	9*	15*
occupied ITS with ≥ 4 shelters with borehole monitored	840	62033	57*	47*

(based on Jan 2019 WAP data)

ITS with access to public networks

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters with connection to public networks	**295**	**88344**	**10**	**26**
occupied ITS with ≥ 4 shelters with connection to public networks as a primary source	201	14473	7	4
occupied ITS with ≥ 4 shelters with connection to public networks as a secondary source	94	73871	3	21

(based on Jan 2019 WAP data)

Use of bottled water

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters using bottled water	**439**	**27919**	**15**	**8**
occupied ITS with ≥ 4 shelters serviced by NGO as primary source and bottled water as secondary	96	9686	9*	5*

(based on Jan 2019 WAP data)

Desludging by NGOs

	number of ITS	total population	% ITS	% population
occupied ITS with ≥ 4 shelters desludged through NGOs	**1762**	**274832**	**61**	**79**
every 1-2 weeks	199	39759	7	11
every month	262	178534	9	52
every 2 to 5 months	431	35446	15	10
every 6 months and more	279	21093	10	6
not clearly accounted for in WAP	1146	71215	39	21
seasonally inaccessible	102	77975	6*	28*
occupied ITS with ≥ 4 shelters with treatment of effluents on site	**196**	**19653**	**11**	**7**

(based on Jan 2019 WAP data)

Effluents of latrines

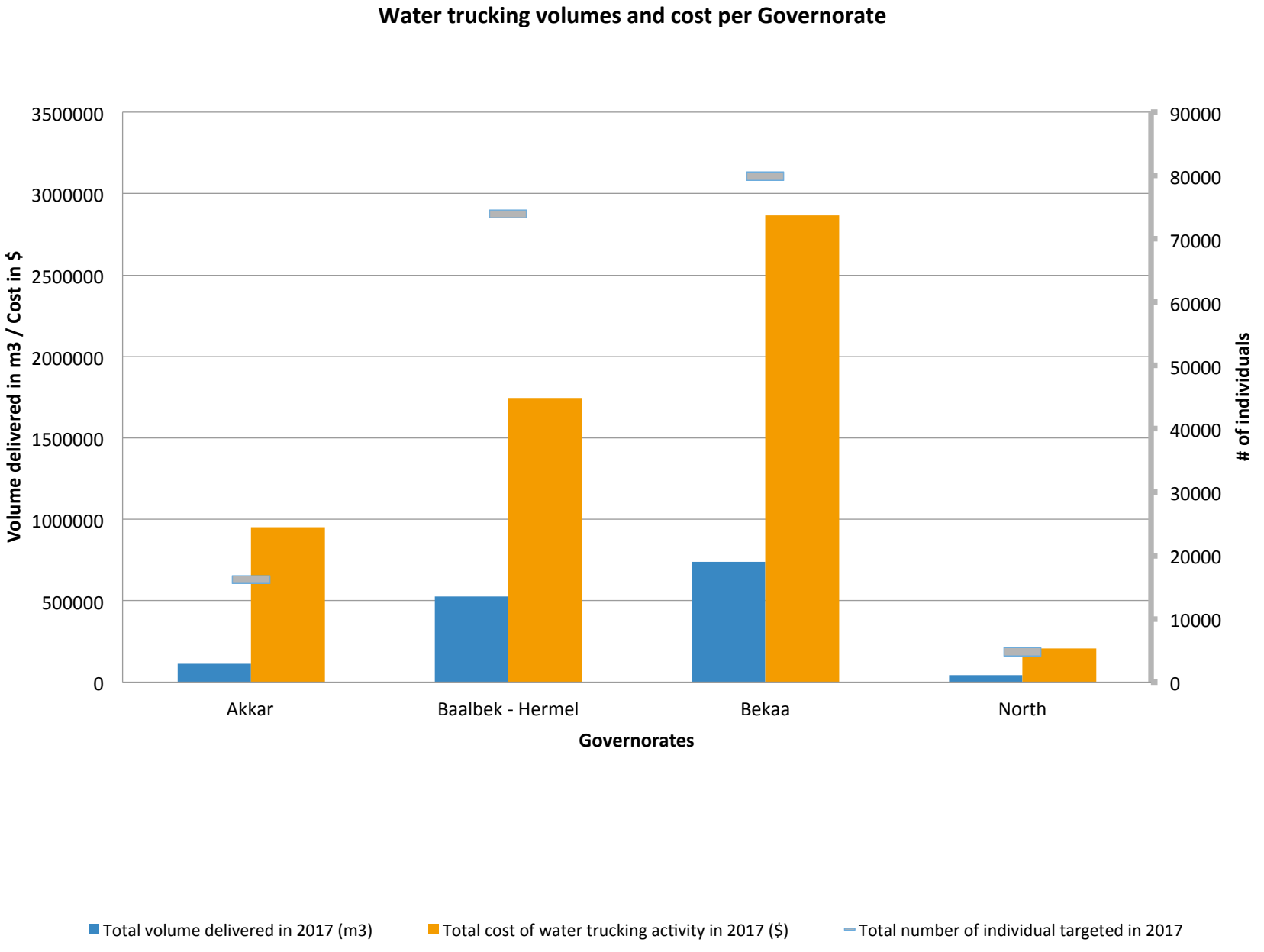
Effluents going to	total # of latrines concerned	% of total latrines	# ITS concerned*	% ITS concerned*
above ground	190.0	0.5	39.0	1.3
water channels	471.0	1.2	80.0	2.8
water bodies	385.0	1.0	43.0	1.5
uncovered pits	1213.0	3.2	150.0	5.2
covered pits	14745.0	38.4	1342.0	46.2
cesspits	6247.0	16.3	544.0	18.7
holding tanks	7744.0	20.1	395.0	13.6
septic tanks	5216.0	13.6	629.0	21.6
public networks	2223.0	5.8	238.0	8.2
total	**38434.0**	**100.0**	**2907.0**	**100.0**

(based on Jan 2019 WAP data)

Water trucking markets

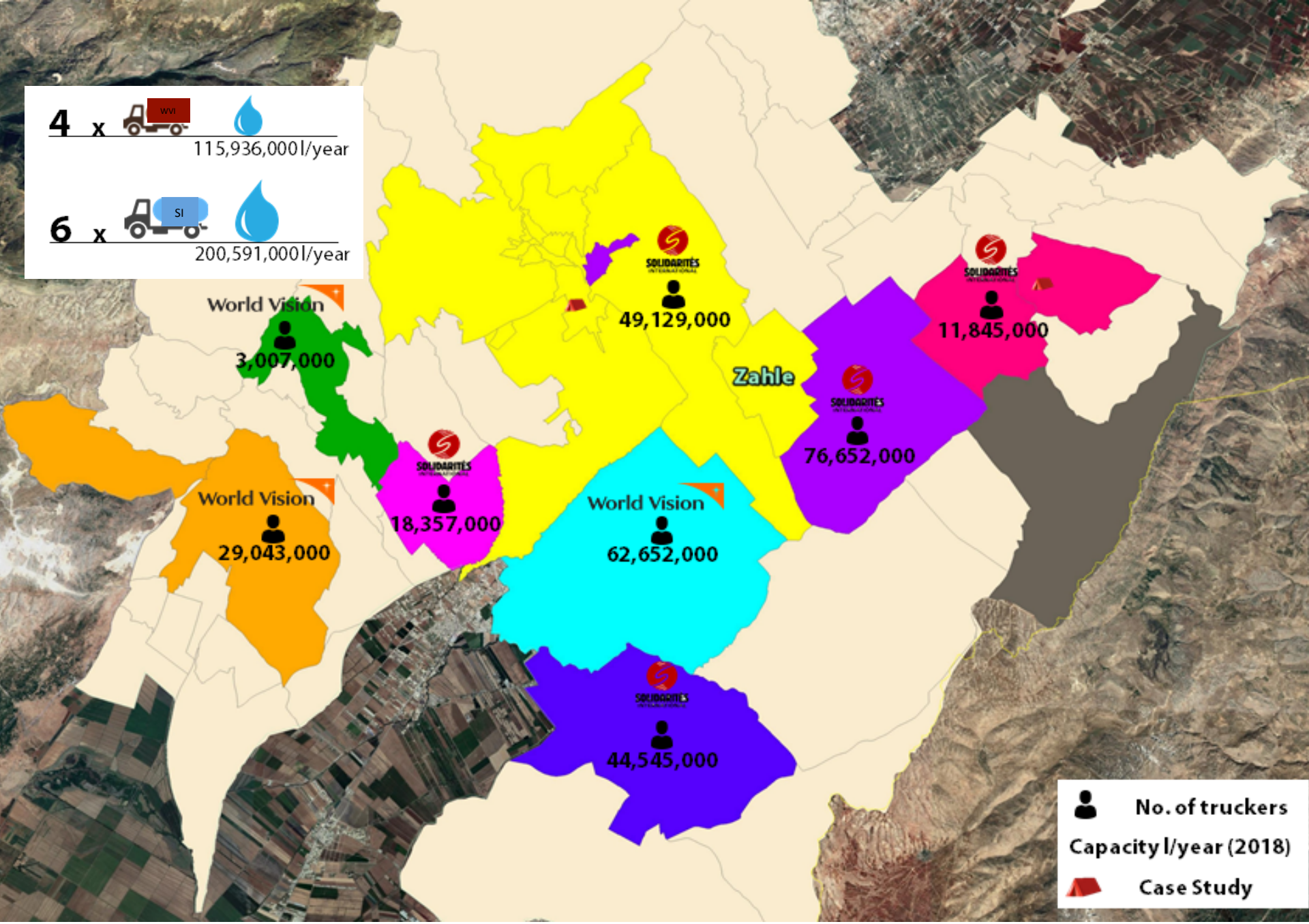
Available data

- The "water truckers' list" table
  - Focus on Bekaa and North
  - Data for 2018 from 5 large humanitarian agencies *SI, WVI, AAH, LOST & CWW*
  - Provides information on quantities of water, number of truckers and areas covered
- The Water Sector data of 2017
  - Provides information on water quantities, prices and areas covered


Water trucking volumes and cost per Governorate
Volume delivered in m3 / Cost in $
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
# of individuals
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Akkar
Baalbek - Hermel
Bekaa
North
Governorates
Total volume delivered in 2017 (m3)
Total cost of water trucking activity in 2017 ($)
Total number of individual targeted in 2017

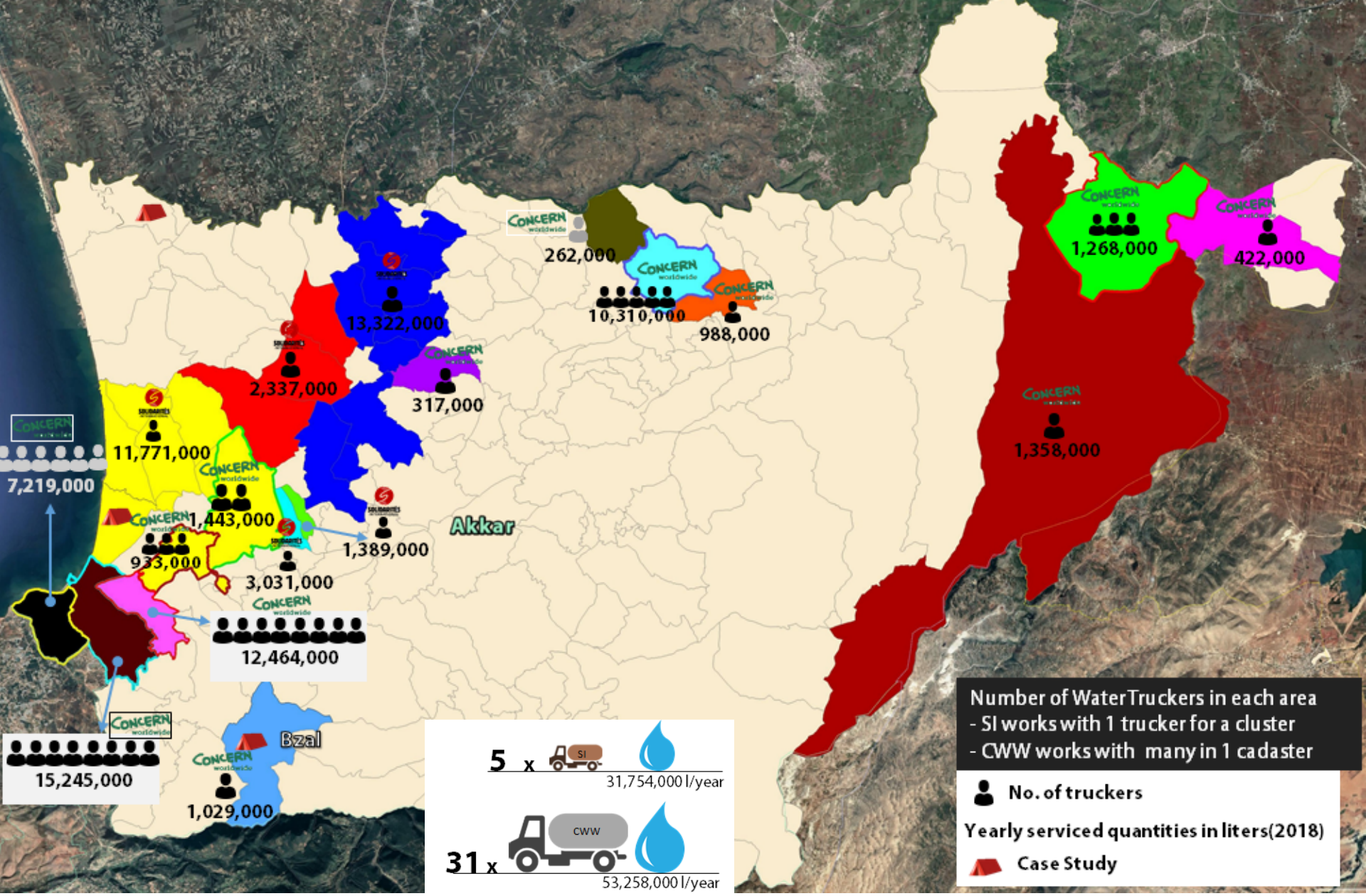
Caza	Average of Water trucking cost ($/m3) in 2017	Average daily volume delivered per individuals in 2017 l/c/day	*Suggestive* Average daily volume delivered per individuals in 2018 l/c/day	Representativeness of sample	*Suggestive* average of Water trucking cost ($/m3) in spring 2019
	According to Water Sector data (2017)		*According to Truckers' Water List (2018)*		*According to UPLoAD sites (2019)*
Aakar	**8.43 (average)** Min 4 Max 12	**19**	*17 (average)* *15 to 19*	*82 % of ITS*	*ITS1: 6* *ITS2: 4*
Baalbeck	**3.31 (average)** Min 2.65 Max 8	**20**	*16 (average)* *14 to 25*	*62% of ITS*	*ITS3: 2.15* *ITS4: 5.3*
Zahle	**3.68 (average)** Min 2.25 Max 5	**25**	*15 (average)* *13 to 17*	*78% of ITS*	*ITS5: 2.45* *ITS6: 3.8*
West Bekaa	**4.25 (average)** Min 3.33 Max 5.38	**25**	*14 (average)* *13 to 23*	*89% of ITS*	*ITS7: 2.7*

- Agencies seem to have different approaches as the way they divide the areas they cover among truckers
  - SI and WVI divide the areas they cover in clusters of neighboring cadastrals and contract a trucker for each cluster
  - LOST and CWW may call for different truckers for the same cluster
  - AAH does not contract more than a trucker by cadastal (to the exception of Aarsal) however, it might contract the same trucker for a dispersed set of cadastrals
- Large difference in the number of truckers per agency
  - E.g. 2 truckers for WVI in West Bekaa, 22 for AAH in Aarsal and 31 for CWW in Aakar



Zahle

(based Truckers' list 2018)



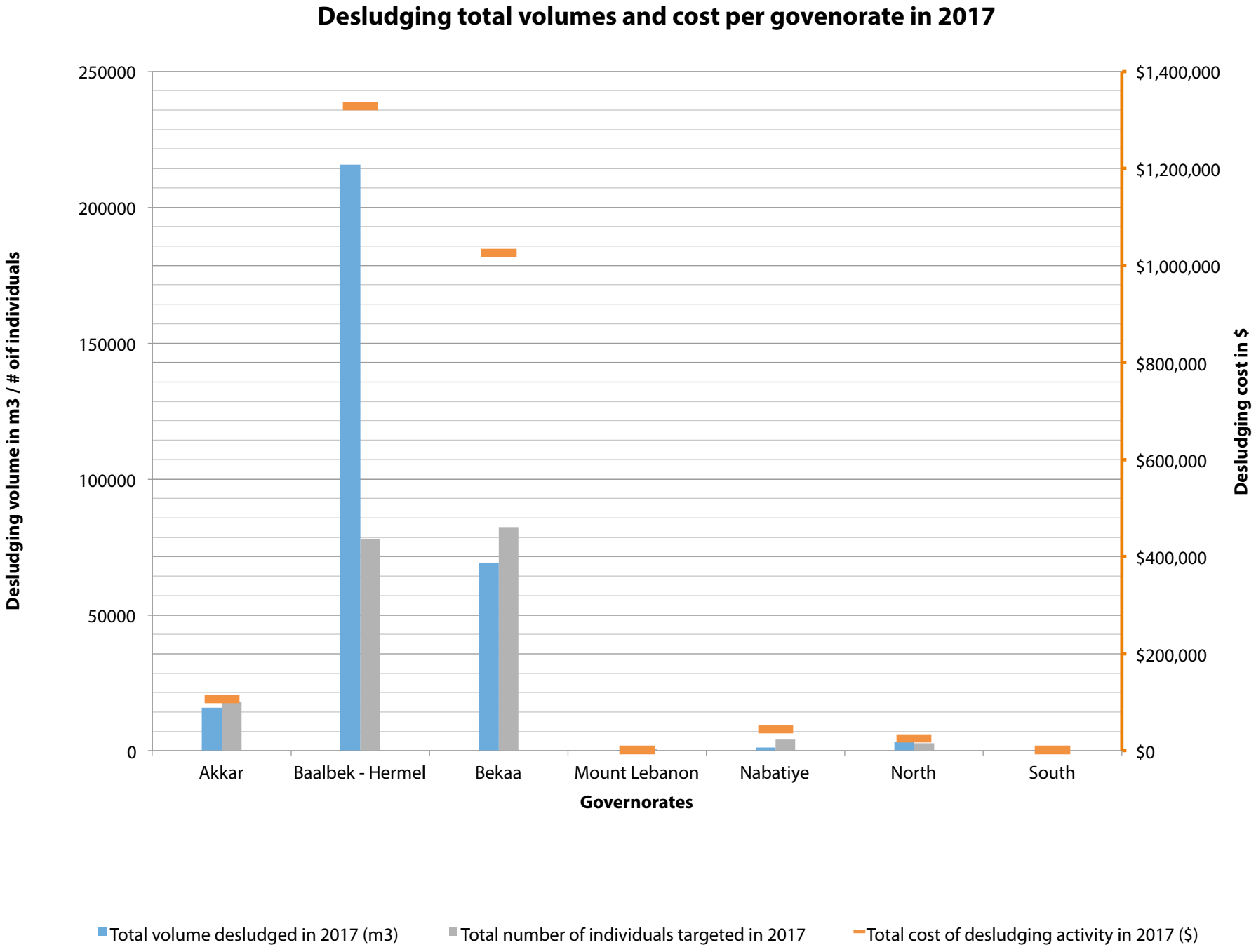
Aakar

(based Truckers' list 2018)

- Disparities in prices are linked to:
  - Competition among truckers within the same area.
  - Potential monopolistic situations.
  - The capacity of negotiation of each agency to contract with one supplier as there is no regulation of the market to standardize costs
  - The cost that the water trucker may have to negotiate to access the water resource in each area.

Desludging markets

- Overall the number of desludging truckers is far below the number of water truckers.
  - Entering this market requires higher initial investment,
- Humanitarian agencies have different monitoring systems to ensure that environmental protection is respected
  - Barcoding,
  - GPS tracker,
  - field monitoring,
  - receipt from water treatment plant,
  - WhatsApp video call, etc.

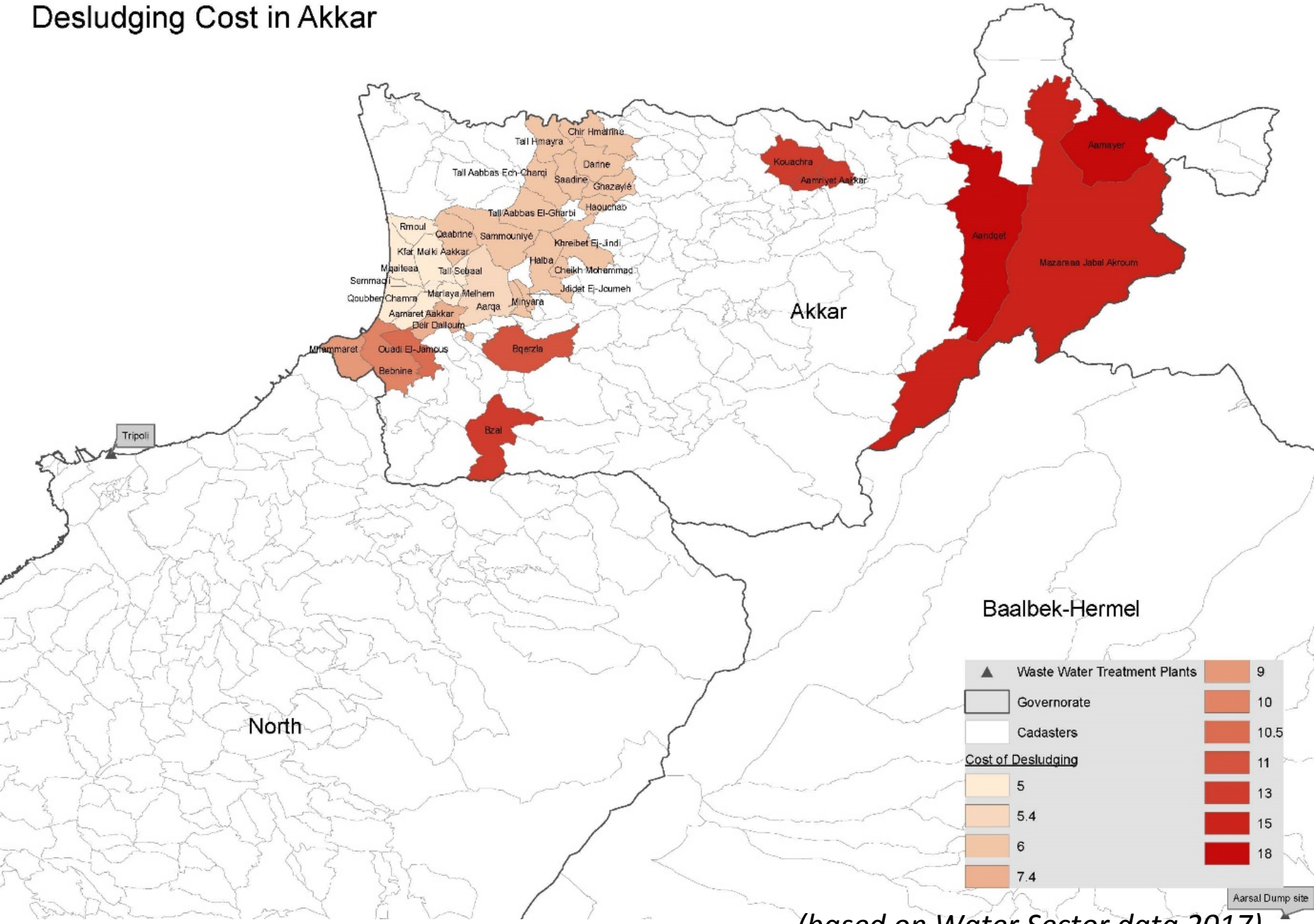

Desludging total volumes and cost per govenorate in 2017
Desludging volume in m3 / # oif individuals
250000
200000
150000
100000
50000
0
$1,400,000
$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$0
Desludging cost in $
Akkar
Baalbek - Hermel
Bekaa
Mount Lebanon
Nabatiye
North
South
Governorates
Total volume desludged in 2017 (m3)
Total number of individuals targeted in 2017
Total cost of desludging activity in 2017 ($)

Caza	Average of Desludging cost ($/m3) in 2017	*Suggestive* average of Desludging cost ($/m3) in spring 2019
	According to Water Sector data (2017)	*According to UPLoAD sites (2019)*
Aakar	**6.71 (average)** Min 5 Max 18	*ITS1: 10* *ITS2: 10* *ITS3: 6.5*
Baalbeck	**13.63 (average without Aarsal)** Min 9.6 Max 19.3 Aarsal 5.47	*ITS4: 6* *ITS5: 9*
Zahle	**14.84 (Bekaa gov. average)** Min 9.9 Max 18	*ITS6: 10.85* *ITS7: 14*
West Bekaa	**14.84 (Bekaa gov. average)** Min 9.9 Max 16	*ITS7: 14*

Caza	Average of Desludging cost ($/m3) in 2017
	According to Water Sector data (2017)
Mount Lebanon	9.60
Nabatiyeh	37.00
North	7.65
South	19.00

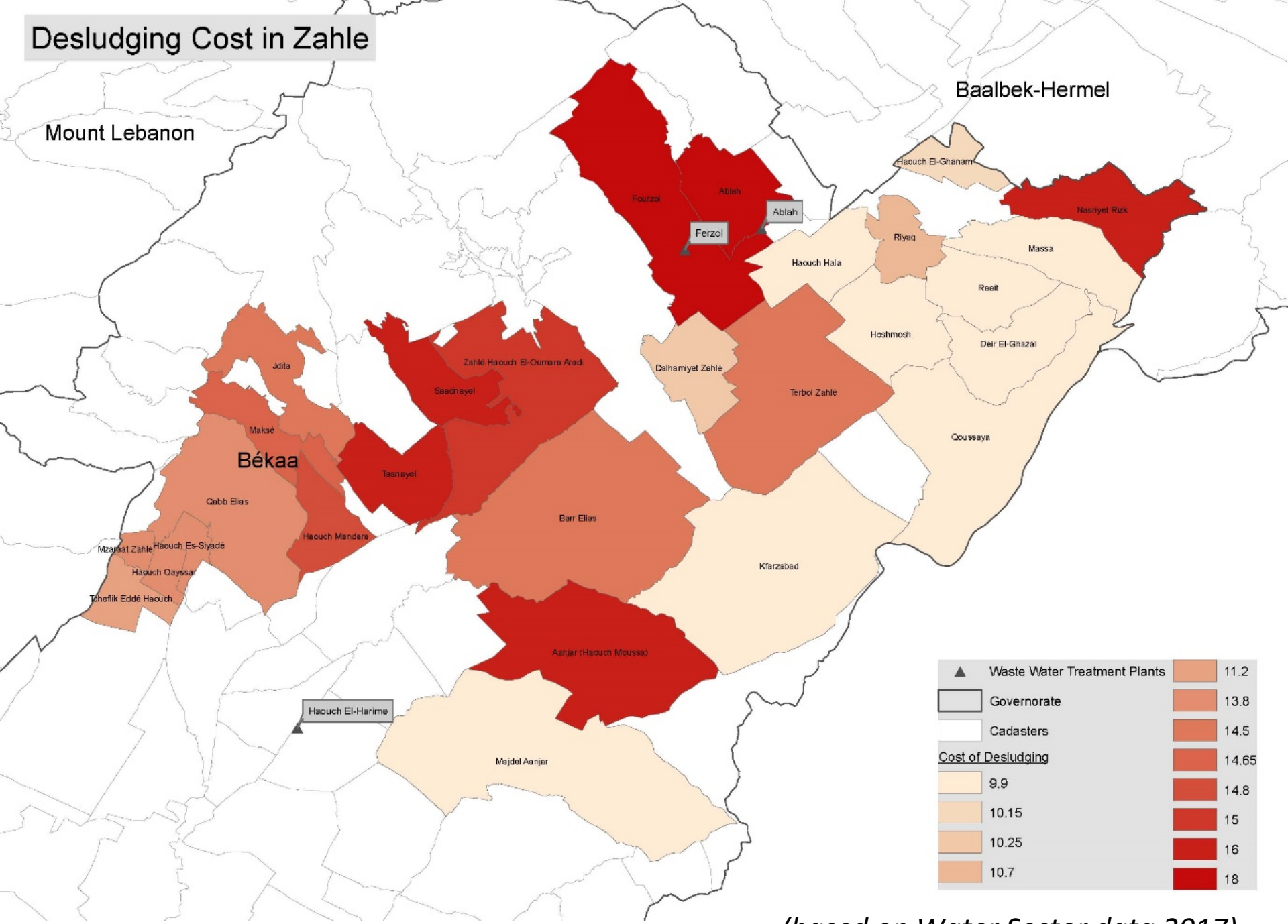
- In Akkar, three desludging truckers dominate the market.
  - They are in competition with one another.
  - Recurrently, these desludgers move from a contract with one humanitarian agency to the other.
  - This is said to impact on the low prices in the area.

Desludging Cost in Akkar



(based on Water Sector data 2017)

- In the Bekaa too, there is a limited number of desludgers
  - around five main ones according to several key informants and desludgers.
  - Many operate simultaneously in different districts.
  - This market is much more fluid than the water trucking market with high opportunities of contracts.
  - Desludgers in the Bekaa are mostly enterprises with several trucks.
  - Transport costs are elevated as desludgers tend to travel long distances in the Bekaa to discharge in wastewater treatment plants.
  - One desludger explained that in the Bekaa some desludgers know one another and meet regularly and have informal understanding as to the division of the market between themselves. However, still there is competition on certain contracts.



(based on Water Sector data 2017)

- Disparities in prices are linked to:
  - The non-regulation of the market especially when it comes to contracts with humanitarian agencies: Most agencies are receiving funds from the same source but are negotiating separately with suppliers and different prices were noticed in the same geographical area.
  - The limited competition between truckers compared to water trucking and the freedom for truckers to juggle between different contracts as depicted during interviews.
  - The lack of regulations related to wastewater discharge which questions the quality of the sludge disposed in treatment plants/ lifting stations/ manholes and to what extent these infrastructures can deal with this concentrated sludge.

II. LEBANESE PUBLIC INSTITUTIONS ADDRESSING WASH AND ITSs

Public Institutions' Representations

- Stigmatization of ITSs
  - A parallel is made with the historic implementation of Palestinian camps in Lebanon
- Strong political resistance to any sustainable servicing of ITSs that would probably lead to long-term establishment

- Criticism by the MoEW to the present mainstream WASH delivery system in ITSs
  - Negative environmental impact due to discharging in the environment in numerous cases
  - Overexploitation of underground water due to higher demand and proliferation of informal wells
  - Lack of information on the trucking markets
  - Concern that water, a public good, is exploited by private operators without control and paying of fees, this is “lost” money for the MoEW

Public Institutions' Actions

- Being autonomous institutions, each WE could have its own approach. However, most are not involved in ITS servicing
- The SLWE has adopted an approach based on:
  - Connection of ITSs' sites to public networks if landowner has a water account and pays fees based on consumption
- However, this model has its limitations:
  - Many ITSs are in rural areas far from public networks
  - Many public networks are controlled by local municipalities and not the WE
  - Regarding WW discharging, this does not mean necessarily an amelioration of the situation
    - *Many public networks discharge in rivers and sea*
    - *Presently most desludgers discharge in WWTP*

- A recent MoEW plan to deal with WASH in ITSs in discussion:
  - It is up to WE to take in hand ITS WASH servicing
  - WE could provide metered water sources
  - WE could operate trucking services
  - Provide a minimum of 50 l/capita/day
  - If local waste water treatment systems with biological treatment are used, then effluents could be discharged in the environment while remaining sludge, desludged only once or twice a year
- Humanitarian agencies would then:
  - Assist in training of WE truckers
  - Help provide trucks to WE

III. STRENGHTS AND VULNERABILITIES OF STAKEHOLDERS IN WATER AND DESLUDGING MARKETS

- Four main stakeholders
  - ITS Dwellers
  - Trucking Services Providers
  - Humanitarian Agencies
  - Municipalities

III.1. ITS Dwellers

ITS Dwellers Access To Water: Quantity, Quality, Cost And Equity

- In terms of water availability, the presence of wells in ITSs represents a considerable asset for their dwellers.
  - Even when it is not potable or faces risks of seasonal pollution, wells' water still covers most dwellers' domestic water needs.
  - ITS dwellers seem to feel less affected by water scarcity
  - Many humanitarian agencies have taken in consideration this factor in their WASH strategies (10 l/c/d)
  - However, the presence of wells in ITSs perimeter is not by itself an assurance of access to its water. It depends on landowners and their own agricultural practices

- Water trucking remains a main source of water available to ITSs dwellers
  - ITS dwellers call and pay themselves for additional quantities from water trucking in half the cases (contradiction with WAP)
  - To the exception of one case dwellers seem to pay more => This suggests that they are more vulnerable in a context of absence of humanitarian agencies (e.g. voucher model)

- Bottled water is not a main source of water however relied on in three cases
  - In many cases households with babies, pregnant women and sick elderly buy additional quantities of bottled water
  - In one case, in the absence of water trucking and the presence of a polluted well, dwellers rely on bottled water for potable water (circa 7 l/household/d)
  - => 76 USD/c/y => impacts on livelihoods => Use of food vouchers to pay bottled water

- Quality of water is a main concern for humanitarian agencies
  - Special clauses regarding water quality are practically always present in contracts with water truckers (water tests, chlorine)
  - In some cases wells could be equipped with water treatment units
- Quality of bottled water bought by ITS dwellers (usually cheap) is not necessarily of good quality

- Regarding equity in water distribution in ITS
  - Informal rules exist as to the daily consumption of common tanks' water
  - The issue of household vulnerability is not integrated in water delivery mechanisms managed by humanitarian agencies

ITS dwellers' access to desludging services

- Studied cases confirmed general WAP tendencies regarding environmental risks
- Dwellers in case studies did not call and pay a desludger themselves
  - Prohibitive prices
  - Low consciousness as to health and environmental impacts
  - Only in one case, where there is a high risk of flooding that dwellers are particularly interested in desludging

Trucking services to ITSs dwellers as source of local tensions

- While in two cases, family and social relations bind Lebanese populations and Syrian displaced in ITSs, in other cases relation is negative if not hostile
- Water trucking may contribute to exacerbate tension
  - This is the case of competition in one case between Syrian and Lebanese water truckers (outside ITSs)
  - In other cases, Lebanese interviewed complain that ITSs receive trucked water at lower prices
  - Tension may grow also when water resources are limited: e.g. the use of on-site well's water for irrigation in summer

Strengths of ITS dwellers in trucking markets and insuring WASH needs

- Dwellers employment and livelihoods
- Shawish's social capital and networks
- Presence of a well on site
- These three factors lead dwellers not perceiving negatively a potential withdrawal of humanitarian agencies from the direct management of the sector and the adoption of a voucher system
  - Only in one case, dwellers expressed their fears that the vouchers model would lead to a weaker position with truckers

III.2. Trucking Services' Providers

Central but Fragile Position

- Truckers are central actors in these markets
- However, their business is fragile and dependent on the WASH services provision model adopted by humanitarian agencies
  - A change in the mode of WASH services provision, like switching to the WASH vouchers' model, may well have unforeseen impacts on these businesses, affecting their development, profitability, job creation potential, even their very existence.

A diversity of profiles

- Service providers range from unregistered individual truckers to medium and large size companies.
- In a few cases only these businesses are involved in other sector activities (construction, etc.)
- To the exception of two cases, truckers' activity is focused mainly on ITSs
- => High dependence of on present WASH services delivery model to ITSs

Scale and Knowledge of ITSs

- To the exception of one case, truckers in this study seem to operate in large numbers of ITS. One said to be operating in more than 200 ITS.
- This projects itself on the knowledge these providers have of the particular situation of each ITS in which they operate.
  - In fact, none of the providers was able to provide values for the volume of their activities in the specific ITS the study was interesting in. They only keep figures of the whole volume of activities related to a contract with a humanitarian agency.

Adaptation and Flexibility

- Truckers for ITSs seem to have adapted their businesses to best operate and be competitive in the context of the present market conditions.
- To be able to be competitive, some truckers propose to:
  - take care of some expenses (like the chlorine to be added to the trucked water),
  - provide some services (e.g. maintenance of some ITS water infrastructures)
  - Provide investments (e.g. install a treatment system).
- The one-contract deal with humanitarian agencies also pushes these providers to optimize their operations (paths they follow, the schedules of ITSs visits, etc.).

Representations of & Concerns with C4W and Voucher systems

- The main concerns of the truckers are threefold.
  - First, this means that they would have to deal directly with ITS dwellers and their representatives for negotiating a separate contract with each ITS
  - Second, this means a very large uncertainty regarding the (fragmented) geography they may end up covering, the perenniality of these contracts and the guarantee that they would be paid.
  - Third, there is clearly a concern that ITS dwellers might not after all use any WASH vouchers that would be provided to them and may even sell them - as pointed out by nearly all trucking services' providers.

III.3. Humanitarian Agencies

The Contract as an Asset

- Though not legally binding, these contracts still have considerable value in these markets.
  - They define the ITS to be covered by providers, including quantities to be serviced, rhythms of service and most importantly health and environmental conditions.
  - However, it must be noted that contracts used by agencies might differ from one area to the other.
  - Moreover, these contracts may be based on a general agreement framework based on price per 1,000 l or may be based on defined quantities.

- Humanitarian agencies have used contracts' terms to sanction certain behaviors
  - One humanitarian agency has given a trucker a warning for using an unregistered truck in providing services to ITS. He had quickly complied by registering his truck.
  - Another agency sanctioned a desludger for calling on children in ITS to help him in manipulating his truck hose.
  - A third agency broke a contract with a desludger for non-environmental discharge.

- Some providers seem to be servicing the same area for long
  - This is due on one hand to pseudo-monopoly or when an informal understanding between truckers makes the bidding system inoperative.

Sustainability of the Present Model

- The main benefit of these wholesome large-scale contracts would be the capacity to bring prices down.
- However, it is obvious that this system of WASH delivery in ITS is not sustainable.
  - Budget cuts with implications on the contracts, their continuity and the quantities covered by these contracts.
  - High per capita/year cost: e.g. in two cases respectively 62USD, and 67USD for water.

- All humanitarian agencies' local representatives interviewed in the context of this study expressed concerns regarding a possible switch towards C4W or WASH vouchers model.

- Nevertheless, they expressed also concerns regarding the sustainability of the present WASH services provision system with the continuous fall in funding.

III.4. Municipalities

Involvement In Provision Of WASH Services

- Most studied municipalities, irrespectively of their size and resources have some form of contribution. This could mean :
  - development and management of existent municipal water or wastewater networks,
  - digging wells,
  - building reservoirs,
  - provision of water trucking services through municipal trucks,
  - financial assistance in the provision of water or desludging services to households by private trucking providers,
  - assistance in operational and maintenance costs for WE infrastructure
  - control of water quality
  - setting defined areas for desludging, etc.

Relation With ITSs And Involvement In Servicing Them

- Some municipalities do not even want to consider ITSs as a reality in their territory to deal with.
- The very large majority maintains regular coordination meetings with active humanitarian agencies in their territory.
- Municipalities may pressure these humanitarian agencies to actively take measures to minimize negative environmental impacts of ITSs.

- In some cases, on the contrary, municipalities may intervene actively in supporting ITSs dwellers.
  - This assistance could be occasional as in the event of sudden heavy storms.
  - It can also be more regular like the provision of social and educational services.
  - In one case, the municipality intervened to provide burial space for ITSs dwellers.

Possibilities of Municipalities being Active in WASH services in ITSs

- With sufficient support, most studied municipalities potentially might contribute to alternative scenarios for securing better WASH services to ITSs. However, two factors may not favor such an eventuality.
  - First, legality of interventions.
  - Second, more importantly, municipalities do not see themselves playing a central role in WASH provision in ITSs for lack of resources or interest

IV. RECOMMENDATIONS: Scenarios and Roadmaps

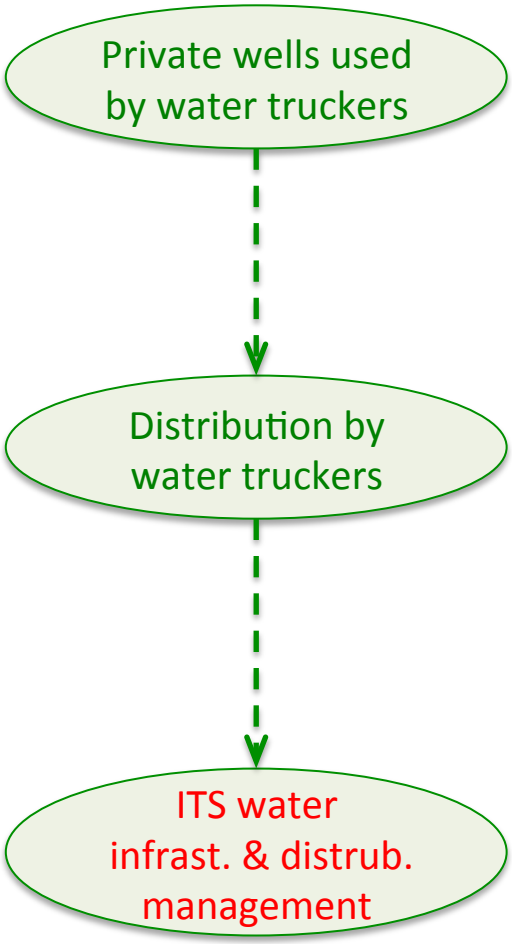
For Water trucking

PRESENT WATER SYSTEM IN ITSs

Managing NGO

Water Sector

Water service providers



MONITORING

Water quality monitoring

Monitoring of local water needs

WAP & IAMP

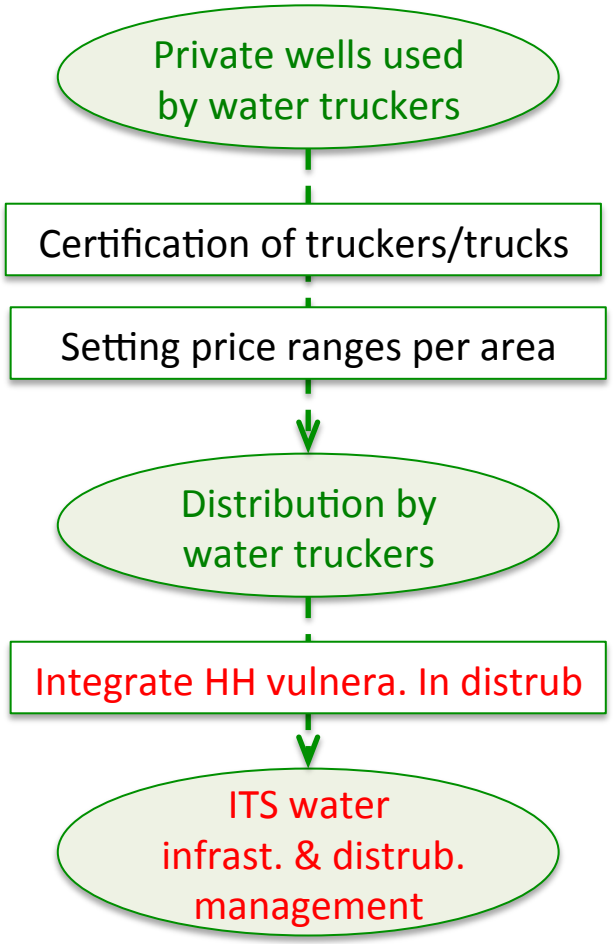
FUNDING

Funding of water distribution

Funding of infrastructure

Funding of WAP & IAMP monitoring

SCENARIO 1:
Business as usual +



Managing NGO

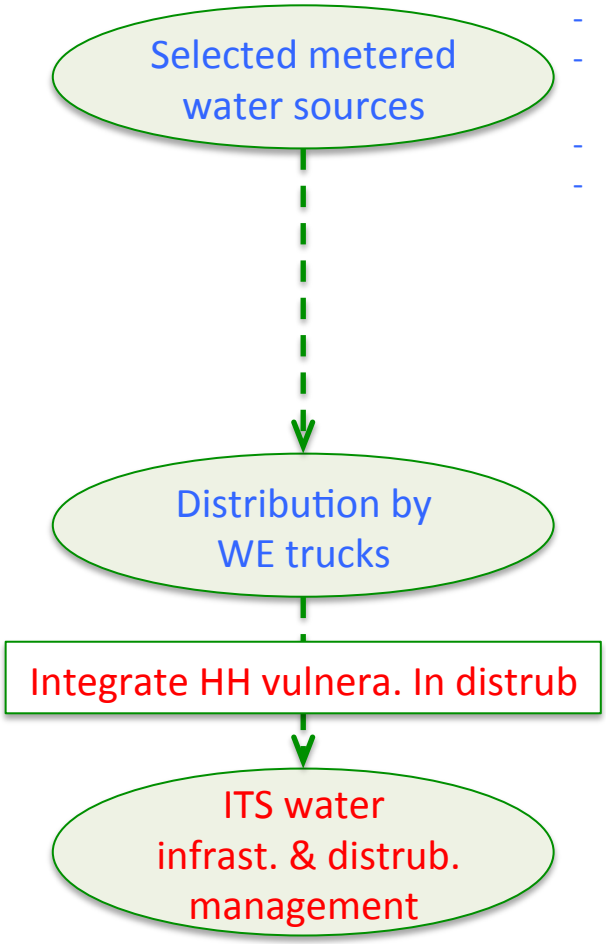
Water Sector

Water service providers

Water establishments

MONITORING	FUNDING
Water quality monitoring Map of wells used + centralization of data on quantities and quality per well impact water resource evaluation	Funding of water distribution
Monitoring of local water needs WAP & IAMP	Funding of infrastructure Funding of WAP & IAMP monitoring

SCENARIO 2:
MoEW base plan scenario



- *Identification of available water sources per area (based on WE Masterplans)*
- *Possible new wells*
- *Setting defined water sources per ITS*
- *Equip wells with meters*
- *Setting fees*

Managing NGO

Water Sector

Water service providers

Water establishments

MONITORING	FUNDING
Water quality monitoring	Funding for equipping wells with meters and digging new wells
Map of wells used + centralization of data on quantities and quality per well	Funding for feasibility study for setting fee
impact water resource evaluation	Funding for certification process
	Funding of water distribution
Monitoring of local water needs	Funding of infrastructure
WAP & IAMP	Funding of WAP & IAMP monitoring

SCENARIO 3:
Realistic ambitious scenario

Managing NGO

Water Sector

Water service providers

Water establishments

- *Identification of available water sources per area (based on WE Masterplans)*
- *Possible new wells*
- *Setting defined water sources per ITS*
- *Equip wells with meters*
- *Setting fees*

Selected metered water sources

Certification of truckers/trucks

Setting price ranges per area

Distribution
Priv. Truckers /
Municip. / Local NGO

Possible use of Vouchers/C4W

Integrate HH vulnera. In distrub

ITS water
infrast. & distrub.
management

MONITORING

Water quality monitoring

Map of wells used + centralization of data on quantities and quality per well

impact water resource evaluation

Mapping willing municip. & local NGO

Mapping local water markets (comp. vs. monopolies)

Monitoring of local water needs

WAP & IAMP

FUNDING

Funding for equipping wells with meters and digging new wells

Funding for feasibility study for setting fee

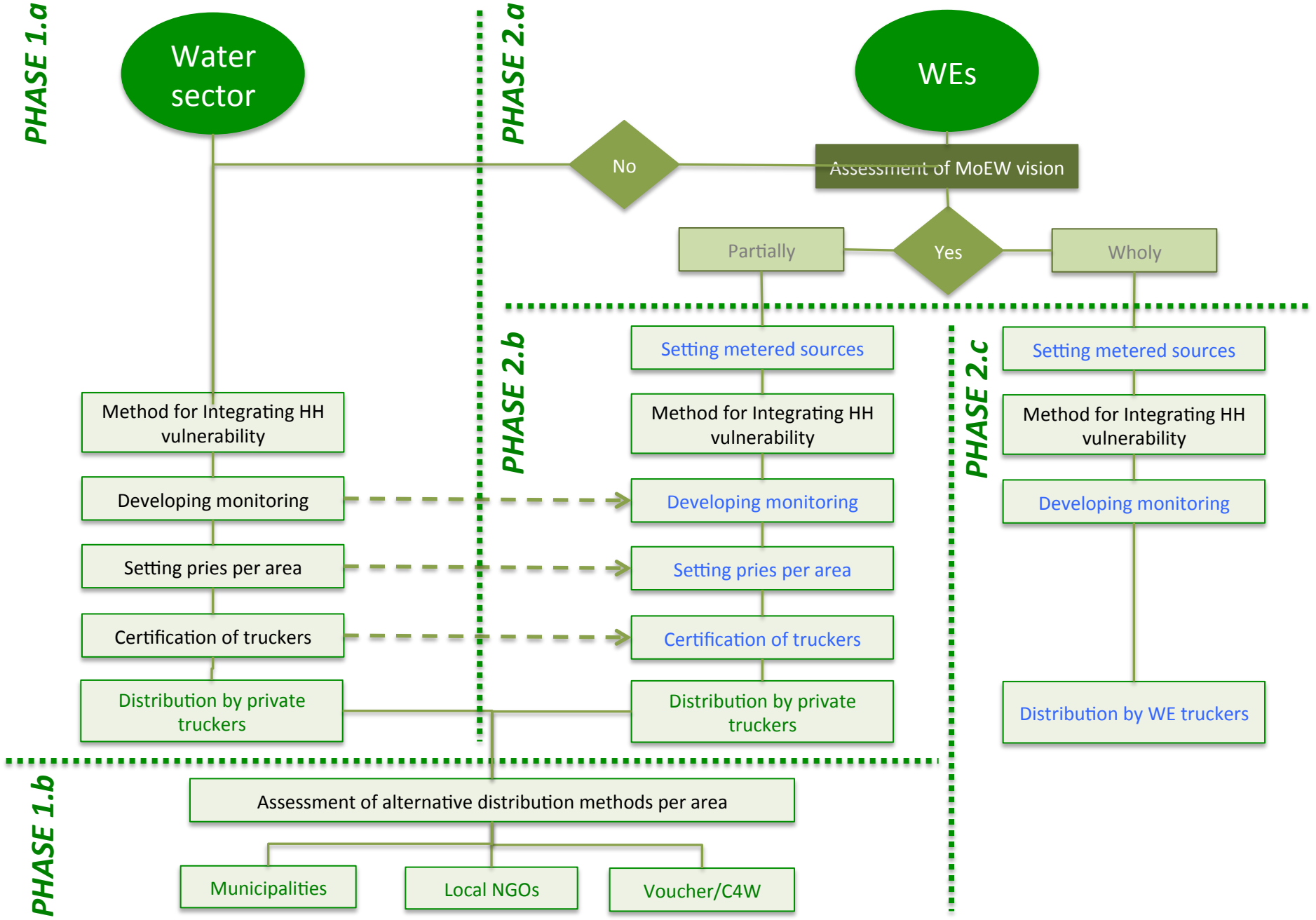
Funding for certification process

Funding of water distribution

Funding of infrastructure

Funding of WAP & IAMP monitoring

A ROADMAP FOR WATER TRUCKING: *Moving between scenarios*



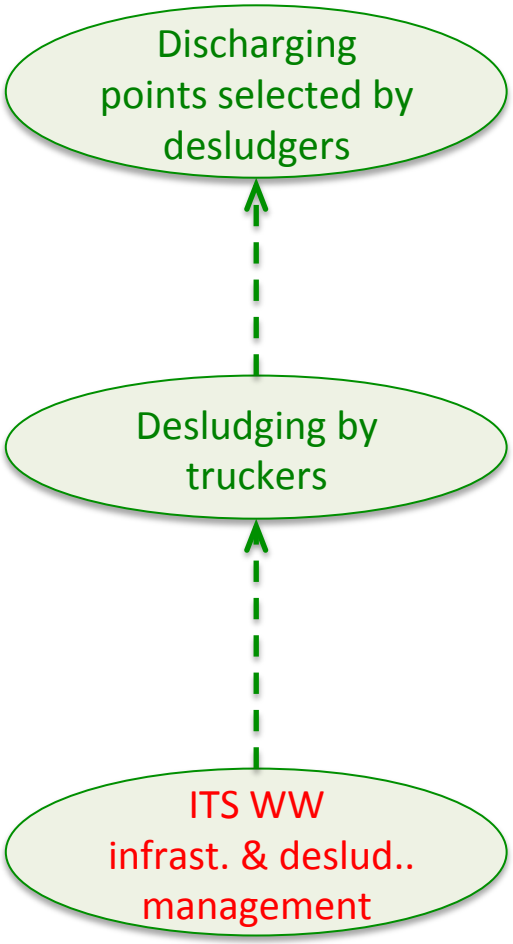
For Desludging

PRESENT DESLUDGING SYSTEM IN ITSs

Managing NGO

Water Sector

Desludging service providers



- Points selected in agreement with M NGOs

MONITORING

Desludgers' discharging monitoring

Monitoring of local desludging needs

WAP & IAMP

FUNDING

Funding of desludging

Funding of infrastructure

Funding of WAP & IAMP monitoring

Secnario 1:
Business as usual +

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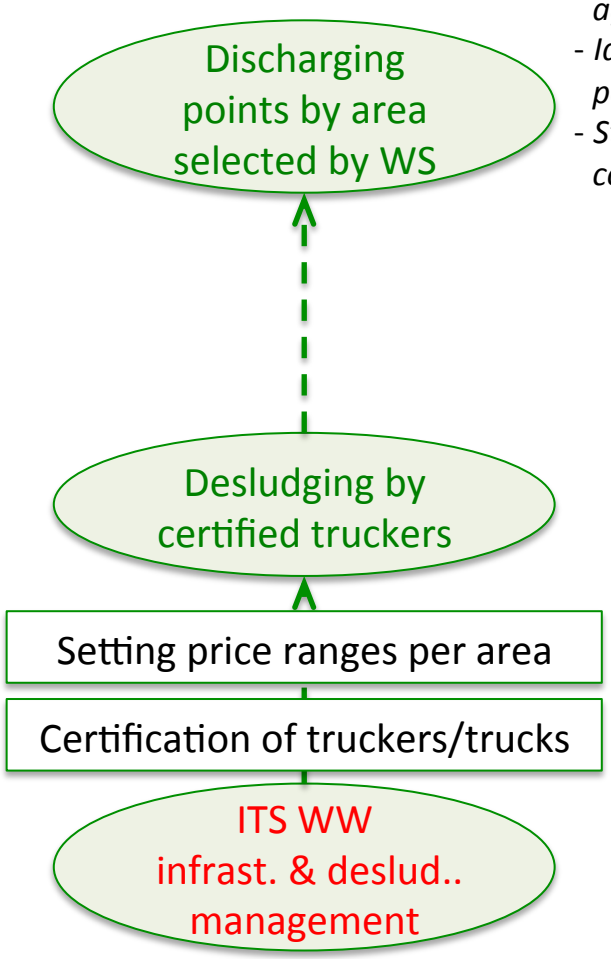
Desludging service providers



- *Map of discharging points selected in agreement with WWTPs*
- *Identified discharging point per ITS*
- *Strategic increase of coverage*

MONITORING

Desludgers' discharging monitoring

Monitoring of local desludging needs

WAP & IAMP

FUNDING

Funding of the processes of discharging points' identification and of certification

Funding of desludging

Funding of infrastructure

Funding of WAP & IAMP monitoring

Secnario 2:
LWWTS-based scenario
(Local Waste Water Treatment System)

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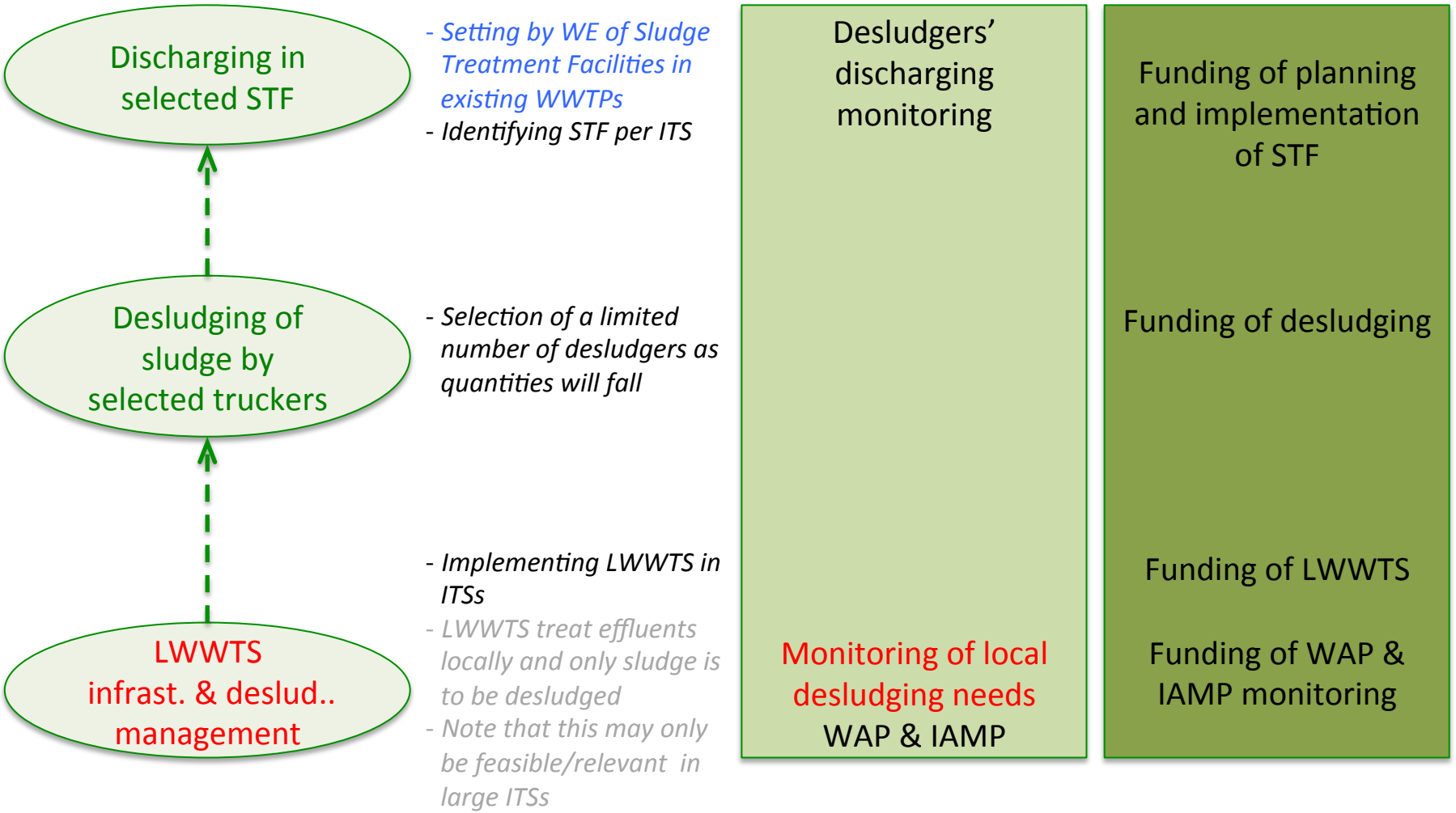
Water Sector

Desludging service providers



THANK YOU FOR YOUR INTEREST