

Which Water Sources Do People Revert to In Times of War?

Evidence from the Sana'a Basin – Yemen

Supplementary Materials (1-4)

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(1) Study Questionnaires

1. Do you have water and energy public networks in your area?

Yes

No

Public water network

Public power grid

2. Are you or have you been using rain water harvesting, either for domestic, agricultural or commercial uses, before or after the events of 2011?

Yes

No

Before 2011

After 2011

If the answer is yes, what is the main reason that made you using harvested water?

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3. What were your main sources of water for domestic before 2011?

	Public network	Water tankers and bottled water	Rain water	Private well	Network or local well	Water points by distributors and organizations	Springs
Primary (most important) source used	☐	☐	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify

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4. What were your main sources of water for domestic since 2011 and up to now?

	Public network	Water tankers and bottled water	Rain water	Private well	local Network or well	Water points by distributors and organizations	Springs
Primary (most important) source used	☐	☐	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify

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5. What are your sources of water for agriculture before 2011?

	Public network	Water tankers	Rain water	Private well	local Network or well	Springs
Primary (most important) source used	☐	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify

6. What are your sources of water for agriculture since 2011 and up to now?

	Public network	Water tankers	Rain water	Private well	local Network or well	Springs
Primary (most important) source used	☐	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify

7. What were your main sources of power (energy) for domestic before 2011?

	Public network	Solar panels	Private generator	Kerosene lamps	Candles
Primary (most important) source used	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify?

8. What were your main sources of power (energy) for domestic since 2011 and up to now?

	Public network	Solar panels	Private generator	Kerosene lamps	Candles
Primary (most important) source used	☐	☐	☐	☐	☐
Second source used	☐	☐	☐	☐	☐
Third source used	☐	☐	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify?

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9. What are your sources of power (energy) for agriculture practices before 2011?

	Public network	Solar panels	Private generator
Primary (most important) source used	☐	☐	☐
Second source used	☐	☐	☐
Third source used	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify?

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10. What are your sources of power (energy) for agriculture practices since 2011 and up to now?

	Public network	Solar panels	Private generator
Primary (most important) source used	☐	☐	☐
Second source used	☐	☐	☐
Third source used	☐	☐	☐

In case the main source is not mentioned above or you have any other comments, please specify?

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11. If your sources of water and/or power (energy) changed compared to those before 2011, what are the reasons that led to this change? You can select more than one reason?

	The lack of services in public networks	Higher cost of those sources than it was before 2011	Lack of money (cash shortage)	Rising fuel prices	Other
The reasons for changing the water source	☐	☐	☐	☐	☐
The reasons for changing the energy source	☐	☐	☐	☐	☐

Any other reasons or observations, please specify

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12. In case you are using new renewable sources for water or energy since 2011, and supposing that the situation is calmed down to the same as it was before 2011; will you continue using these new sources?

☐ Yes

☐ No

What are the reasons, or what is the main reason for that decision?

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13. If you are using water tankers, what is the lowest and the highest prices (in YR) you have paid since 2011 until now? Answer only the fields that fit to your use and what you have purchased yourself since 2011!

	Water tanker (3 m ³)	Water tanker (5 m ³)
Highest price		
Lowest price		
Current price		

14. Contact details (optional)

Name:

Email:

Phone No:

(2) Primary water sources before and during war with online and paper based results

	All Participants (220)		Online (134)		Paper (86)		Urban all (170)		Rural all (50)	
Public Networks (%)	Yes	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO
Availability of Water Network	59	41	71	29	40	60	68	32	26	74
Water sources before & During War (%)	Before	After	Before	After	Before	After	Before	After	Before	After
Public network	41	9	48	13	29	4	50	10	8	6
Water tankers and bottled water	39	72	38	74	40	68	43	86	24	24
Rain water	0	1	0	0	0	1	0	0	0	2
Private well	9	11	8	7	12	19	1	1	36	46
Network or local well	11	6	7	7	16	4	6	2	26	16
Water points by distributors and organizations	0	1	0	0	0	1	0	1	0	0
Spring	1	1	0	0	4	4	0	0	6	6
Total	100	100	100	100	100	100	100	100	100	100

(3) Primary and Secondary Water Sources of Water Before and During War

			Public network		Water tankers & bottled water		Rain water		Private well		Network or local well		Water points by distributors		Springs		Total participants
Urban	Primary source	Before War	85	50%	73	43%	0	0%	2	1%	10	6%	0	0%	0	0%	170
	Second source		16	11%	118	83%	4	3%	1	1%	0	0%	3	2%	0	0%	142
	Third source		4	4%	59	64%	8	9%	3	3%	8	9%	10	11%	0	0%	92
	Primary source	During War	17	10%	145	86%	0	0%	2	1%	4	2%	1	1%	0	0%	169
	Second source		33	24%	74	54%	16	12%	0	0%	5	4%	9	7%	0	0%	137
	Third source		9	9%	50	51%	24	24%	2	2%	6	6%	8	8%	0	0%	99
Rural	Primary source	Before War	4	8%	12	24%	0	0%	18	36%	13	26%	0	0%	3	6%	50
	Second source		1	3%	18	46%	2	5%	12	31%	4	10%	1	3%	1	3%	39
	Third source		1	4%	13	48%	9	33%	2	7%	2	7%	0	0%	0	0%	27
	Primary source	During War	3	6%	12	24%	1	2%	23	46%	8	16%	0	0%	3	6%	50
	Second source		0	0%	24	67%	2	6%	6	17%	2	6%	1	3%	1	3%	36
	Third source		1	5%	6	30%	9	45%	3	15%	0	0%	1	5%	0	0%	20

(4) Reasons underlying people's willingness to continue use/not use RWH & solar energy

Why willing to continue using new sources of RWH and solar energy

	Public system is not enough	Lack of confidence in the public system	In order to preserve the source and acquired assets	cheaper and to save part of bill cost	Environmental Preservation	Continuity and safety of new Systems	availability of technologies
Respondents %	6%	19%	5%	42%	10%	12%	5%

Why not willing to continue using new sources of RWH and solar energy

	Inefficiency of these New Systems	It is the government responsibility	Quality issue	public system is cheaper	Capital cost of new systems
Respondents %	47%	6%	12%	24%	12%