

Side event on Small-scale water supplies and sanitation in the European Region

# Improving the evidence base of the situation of SSWSS in Serbia through rapid assessment

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Fourth session of the Meeting of the Parties  
Geneva, 14-16 November 2016

Protocol on Water and Health



# RADWQ in Serbia

- \* **Nation-wide rapid assessment**

  - Technically supported by WHO/Europe

  - Financially supported by UNDA project

  - In-kind contribution by Serbia network of IPHs

- \* **Study design:** WHO methodology for the rapid assessment

  - “Rapid assessment of drinking-water quality: a handbook for implementation”  
(2012)



# Objectives

The objectives of the survey were to:

- \* **Acquire** a nationally representative picture of the situation of small scale water supply systems in rural areas
- \* **Support** the implementation of the national targets
- \* **Develop baseline analysis** of the drinking water quality and prevailing sanitary conditions of small-scale water supply systems in rural Serbia
- \* **Inform programming** of improvement interventions and further policy development in the water and health domain.



# Scope and coverage

**Piped systems (PS)**  
serve more than 20  
people (or 5  
households)

**Individual supplies  
(IS)** serve less than  
5 households, piped  
or non/piped,  
shallow wells or  
boreholes

**Total sample size:**

n=1,344

PS: 1,168 sample taken

PS: 1,136 inspected

IS: 176



WHO  
methodology for  
rapid assessment

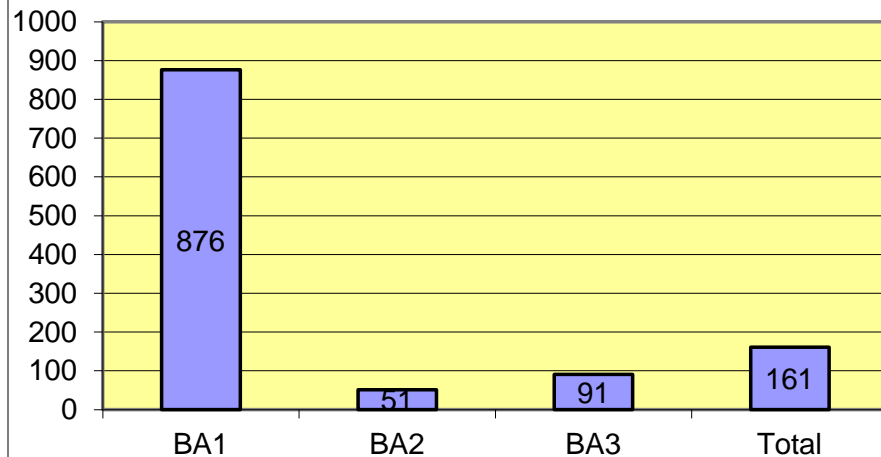
Field work: april–  
august 2016.

3 Broad Areas

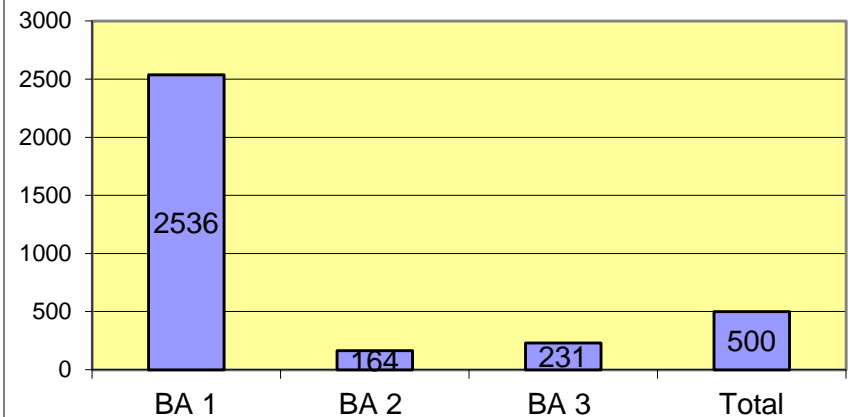
26 districts,  
29 field teams,  
whole network  
of IPHs

# General characteristics of sources for piped systems by Broad Areas

### Number of household (mean)



### Number of consumers (mean)



# General characteristics of sources for piped systems by Broad Areas

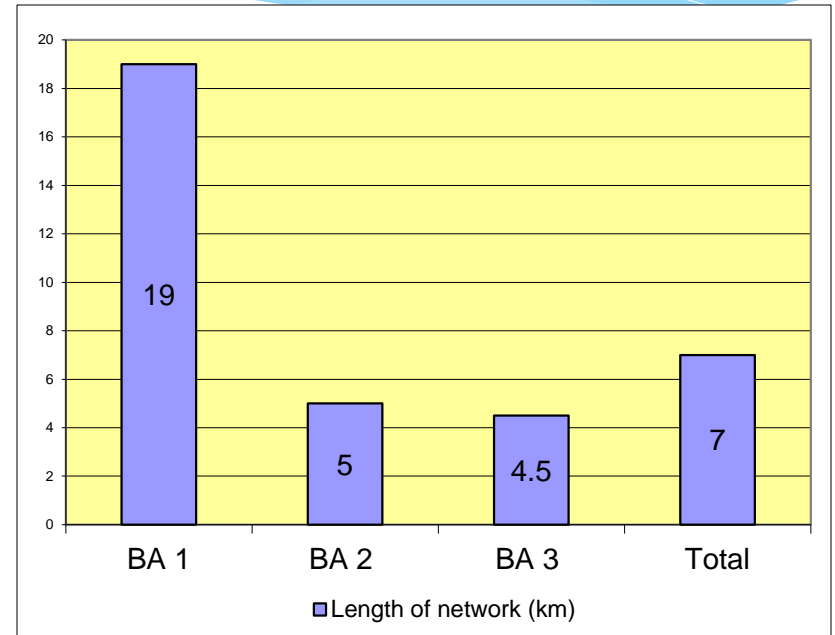
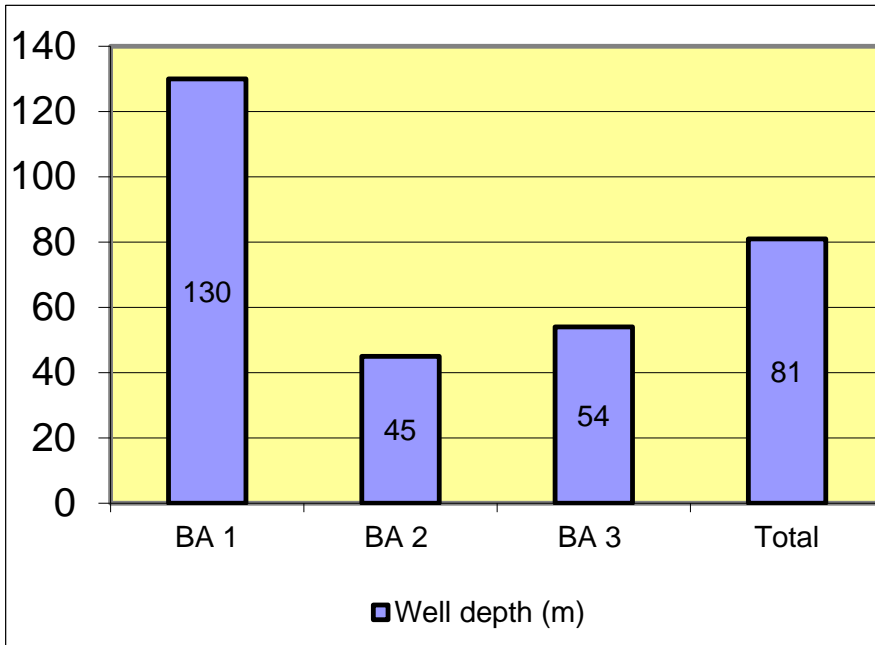


Table 3 Proportion of drinking water sources by type of supply technologies (%) – preliminary results

Type of drinking water sources	PS*	IS**
Protected spring	67.2	14.3
Borehole with electrical pumping	21.4	26.4
Borehole with hand pump	/	9.3
Dug well with hand pump	0.5	2.7
Uncovered dug well	0.6	12.1
Dug well with windlass and partial cover	1.3	8.2
Dug well with electrical pumping	8.9	26.9
Surface water intake (small dam across the river/stream)	0.1	/

\*Piped systems \*\* Individual supply



# Owners of PS by Broad Areas

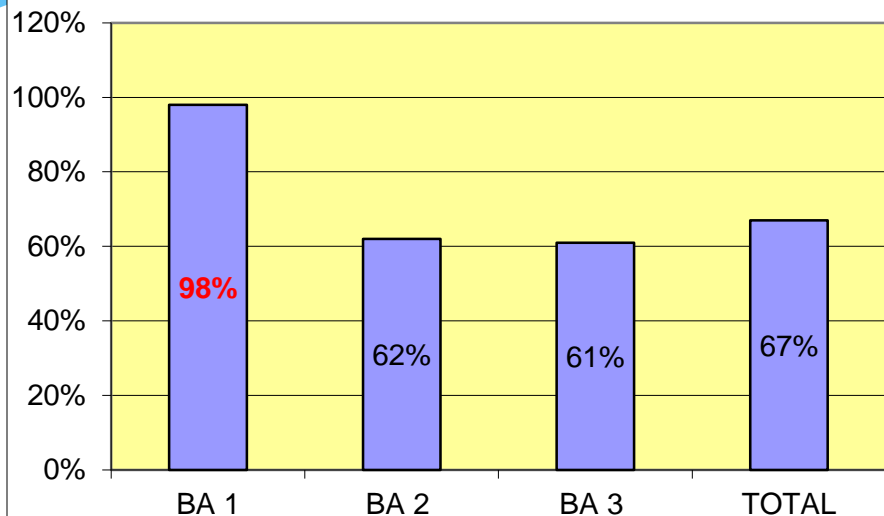
Owner	BA 1	BA 2	BA 3
Public Utility	80 %	3 %	2 %
Local community	12 %	12 %	50 %
Municipality	4 %	0 %	1 %
A group of inhabitants	0 %	62 %	38 %
Individual owner	0 %	10 %	3 %
Primary school	0 %	8 %	5 %
Other company (utilities)	3 %	1 %	0 %
Other	0 %	3 %	2 %
Total	100 %	100 %	100 %

- 12 % of inspected PSs are managed by Public Utility
- Maintenance and operating is left to insufficiently qualified personnel

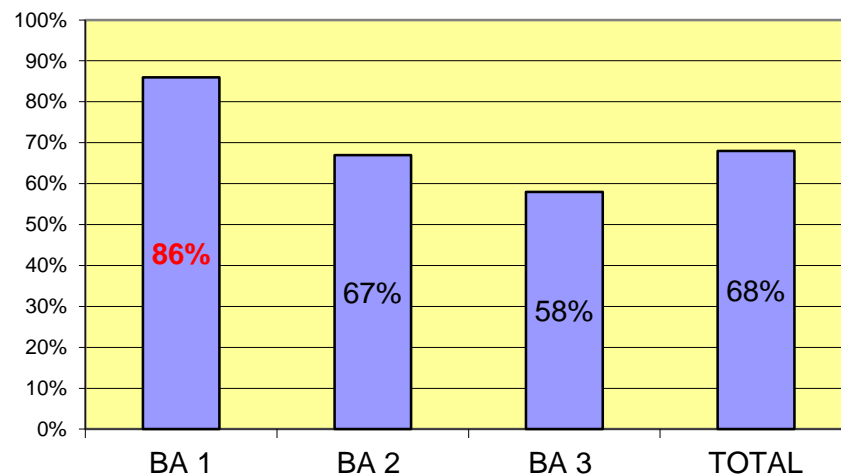


# Compliance for *E. coli* with national regulation (%) by Broad Areas

Piped systems



Individual supplies



Detection of chlorine PS	BA 1	BA 2	BA 3	Total
No chlorine detected	11%	85%	75%	71%
Chlorine detected	89%	15%	25%	29%
Total	100%	100%	100%	100%

Detection of chlorine IS	BA 1	BA 2	BA 3	Total
No chlorine detected	33%	56%	71%	56%
Chlorine detected	67%	44%	29%	44%
Total	100%	100%	100%	100%

# Physico-chemical compliance with national regulation (%) for PS and IS by Broad Areas

PS	BA 1 N=168	BA 2 N=624	BA 3 N=376	Total N=1168
Residual chlorine**	98%	100%	100%	99%
Color	45%	98%	94%	89%
Odor	86%	100%	99%	98%
Turbidity	88%	95%	96%	94%
Conductivity	74%	92%	91%	89%
pH value	100%	92%	98%	95%
Ammonia	61%	99%	99%	94%
Nitrates	99%	92%	94%	94%
Manganese	64%	99%	99%	94%
Arsenic	58%	98%	99%	93%

IS	BA 1 N=36	BA 2 N=90	BA 3 N=56	Total N=182
Residual chlorine**	100 %	100 %	100 %	100 %
Color	50 %	99 %	86 %	85 %
Odor	97 %	100 %	98 %	99 %
Turbidity	61 %	98 %	96 %	90 %
Conductivity	72 %	70 %	86 %	75 %
pH value	100 %	93 %	93 %	94 %
Ammonia	53 %	100 %	100 %	91 %
Nitrates	94 %	76 %	75 %	79 %
Manganese	69 %	91 %	100 %	90 %
Arsenic	83 %	99 %	100 %	96 %

\* The Rulebook on Hygiene Safety of Drinking Water ("Official Journal of the FRY" No. 42/98)

\*\* Of 1168 samples, 626 the residual chlorine was not detected.

# Results of sanitary inspection – sources for PS

Spring	Borehole - electric pump
Unfenced 72.7%	Source of pollution within 50 m 65.2%
Allowing access of animals within 10 m 61.7%	Presence of latrine or sewer within 100 m 62.8%
The ditch is absent or non-functional 63.1%	Drainage channel is absent or non-functional 55.6%

# Results of sanitary inspection – distribution network for PS

## Distribution network

Drinking water is not chlorinated 77.2%

The largest part of the network has not been replaced during the past 10 years 74.7%

Managed by unqualified persons 66.1%

# Results of sanitary inspection – sources for IS

Borehole - electric pump	Dug well – electric pump
Presence of latrine or sewer within 100 m of pumping mechanism 72.9%	Drainage channel is absent or non-functional 65.3%
Drainage channel is absent or non-functional 64.6%	Source of other pollution within 10 m 59.2%
Source of other pollution within 50 m 58.3%	Concrete floor less than 1 m wide around the well 57.1%

# RADWQ in Serbia– the main results/4

Risk-priority matrix for all types of sources for piped systems

E.coli count (1/100) ml	Sanitary inspection score			
	0-2	3-5	6-8	9-10
<1	28.8 %			
1-10		42.0 %		
11-100			23.2 %	
>100				6.3 %



Low risk – No action required



Intermediate risk – Low action priority



High risk - Higher action priority



Very high - Urgent action required

# Risk-priority matrix for all types of distribution networks for PSs

E.coli count (1/100) ml	Sanitary inspection score			
	0-2	3-5	6-8	9-10
<1	22.1 %			
1-10		45.7 %		
11-100			24.7 %	
>100				7.4 %



Low risk – No action required



Intermediate risk – Low action priority



High risk - Higher action priority



Very high - Urgent action required



# RADWQ in Serbia– the main results/5

## Risk-priority matrix for individual supplies

E.coli count (1/100) ml	Sanitary inspection score			
	0-2	3-5	6-8	9-10
<1	23.1%			
1-10		36.3%		
11-100			33.5%	
>100				7.1%



Low risk – No action required



Intermediate risk – Low action priority



High risk - Higher action priority



Very high - Urgent action required

# Key recommendations –way forward

\*To **address WSP concept** in national regulations, as well as **individual supplies**

\*To **develop national and local action plans** for the improvement of the situation on SSWS including **drinking-water safety, protection of sources,** sanitary inspection, technical improvements and increased awareness-raising activities for the population.

\* To **present and disseminate results of RADWQ** at district level to **local self-government** by local IPHs, as well as at **sub-regional level.**

\*To **enforce** implementation of existing regulation, in order to **resolve the ownership** issue of SSWSS.

\* To complement baseline analysis and **inform revision of national Protocol's targets** related to SSWSS.















\* SSWSS – RD1 - distribution system with reservoir

