



# PAWA – Pilot Arno Water Accounts

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**PAWA Project Leader**

**CIS Working Group on Programme of Measures**  
**DG ENV, Bruxelles, 15 October 2015**

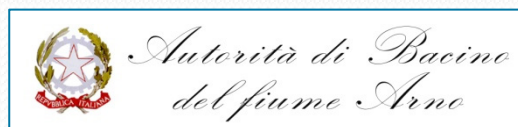
**PAWA** was a 15-month pilot action in the **Arno River Basin** (NW Italy) aimed at:

- ✓ improving knowledge on water resources available and their use;
- ✓ *implementing and testing at basin level the UN water accounting approach **SEEA-Water**;*
- ✓ assessing the potential impact of management, technological and economical measures to reduce the territory vulnerability against water scarcity and drought.

The pilot action started in January 2014 and ended in March 2015.

PAWA activities were based on a continuous co-operation, interaction & concertation at four different levels: **basin/local**; **Italian**; **EU**; and **EUROMED**.

The PAWA consortium:



Final grant: **€ 141.464,33** (75% of the eligible costs: **€ 188.619,11**)

# The PAWA consortium



**ISPRA**

Istituto Superiore per la Protezione  
e la Ricerca Ambientale

**ISPRA** is the technical-scientific branch of the Italian Ministry of Environment. It operates within the Environmental Agencies System, composed of 20 Regional and 2 Provincial Agencies, according to a federative system. ISPRA combines direct knowledge and experience of local environmental issues with national and European policies (incl. **EU WFD 2000/60/EC**; **EU FD 2007/60/EC**; **WS&D Comm.**) for environmental prevention and protection.



*Autorità di Bacino  
del fiume Arno*

**ARBA**, which one of the six River Basin Authorities of National Relevance, has been carrying out programming and planning activities on land protection and water resources management since 1989. In recent years, ARBA has been entitled, in accordance with the **EU WFD**, to draft the RBMP for the Northern Apennines River Basin District and to coordinate the implementation activities as regards to the **EU FD**.



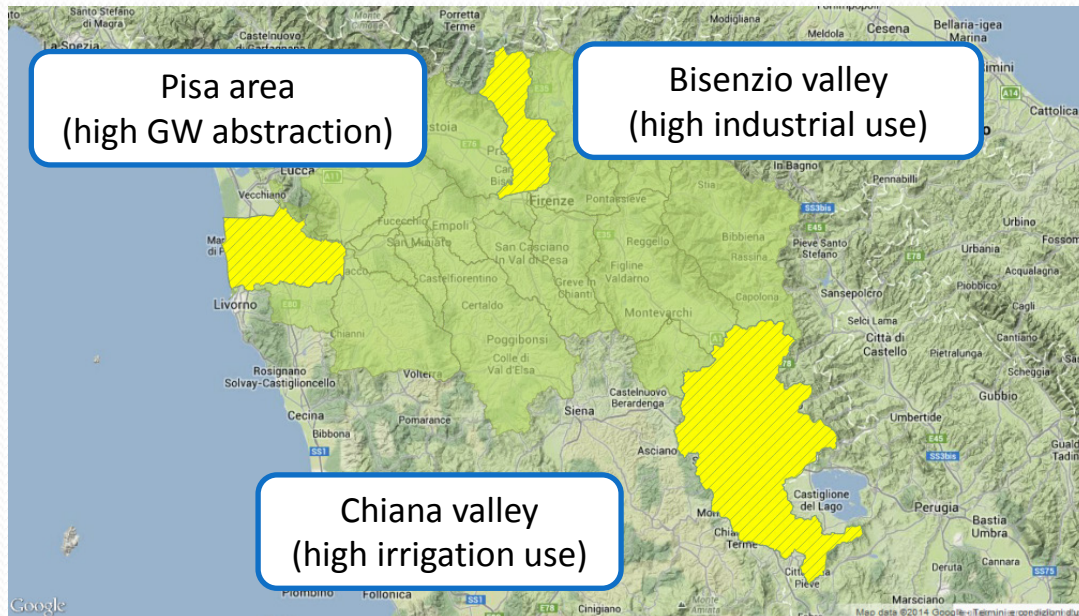
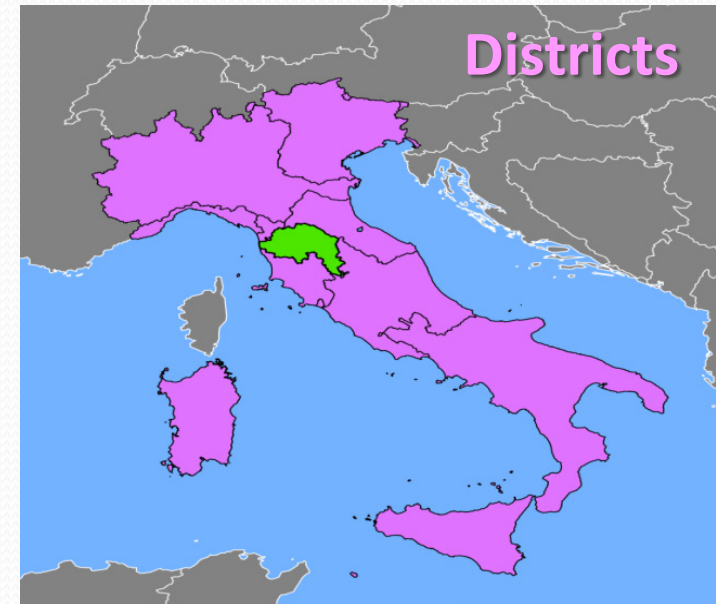
**SEMIDE/EMWIS** is an initiative of the Euro-Mediterranean Partnership (EUROMED) that provides a strategic tool – the only one operational nowadays – for exchanging information and knowledge in the water sector between and within the EUROMED countries. In the framework of the WGs of the Mediterranean Joint Process between the **EU Water Initiative** and the **EU WFD**, EMWIS is also working on know-how exchange for specific themes selected by the EUROMED water directors.

# The Arno River Basin & the target sub-basins



# The Arno River Basin & the target sub-basins

- ❑ River length of **241 km**
- ❑ Surface area of **8.228 km<sup>2</sup>**
- ❑ 98% belongs to Tuscany Region;  
2% belongs to Umbria Region
- ❑ The basin comprises 171 municipalities and 8 provinces (Arezzo, Florence, Pistoia, Pisa, Siena, Lucca, Livorno and Perugia)



Identification of 3 sub-basins  
where water accounts will  
have the best potential



# Why the Arno River Basin as pilot basin?

## Drought events during the last 10 years:

In **2003 & 2007** a serious summer drought in the basin; many decentralized aqueducts remained without direct water supply.

At the turn of **2012**, an anomalous autumn drought in the basin that lasted till spring. It was characterized by not only the total absence of flow peaks (very common in late autumn) but also new absolute minimum recharge rates (reg. between Oct. and Mar.), with reference to the available time series of rain gauge data (last 90 years).

## Water scarcity and management of critical conditions – What is ARBA doing?

In **2008** a Water Balance Plan for the Arno River Basin was adopted in accordance with Legislative Decree 152/2006 and its provisions managing withdrawals and releases are binding on the territory including granted volume reduction which aims to ensure environmental protection (i.e., respect of EF) and optimization water uses.

A draft version of a “drought management plan” was included in the PoM of Northern Apennines District RBMP.

Plans are based on a 10-yr experience of “drought management” provided by a special Water Protection Commission that includes representatives from local administrations, municipalities, water management companies, and government representatives. This Commission monitors and manages droughts by the means of:

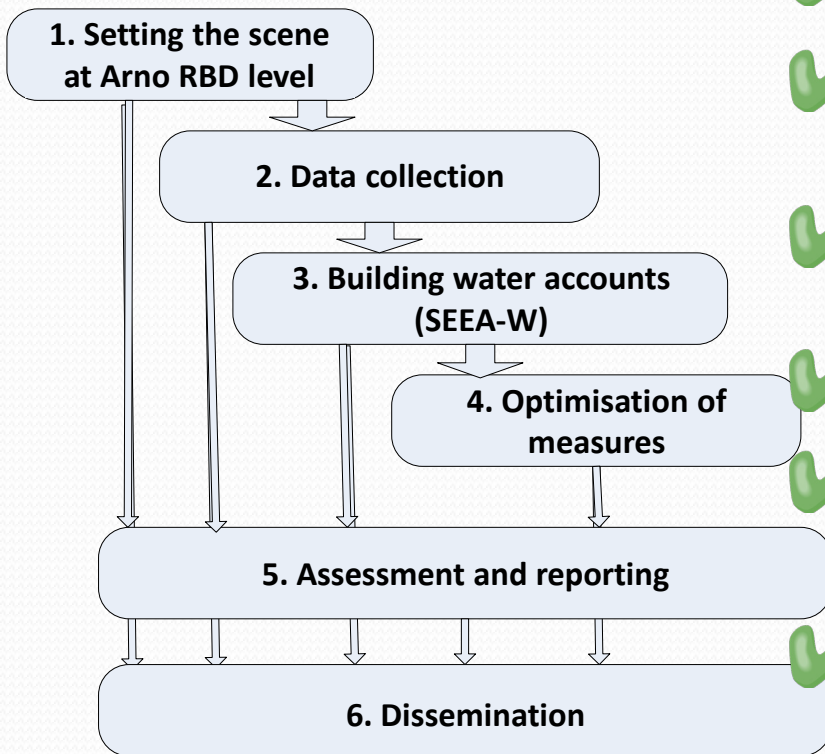
- Mid- and long-term meteo forecast analysis, regarding ground- and superficial water body recharges; and
- Implementation of participative policy for the management of water reservoirs and limitation of withdrawals.

## Water scarcity and management of critical conditions – ARBA and ISPRA experiences in WS&D

In the framework of the **2010–2012** activities of the CIS “Water Scarcity & Drought” Expert Group, ARBA and ISPRA tested the application of a modified Water Exploitation Index for the Arno River Basin on a monthly basis.

# PAWA activities & expected results

## Six interconnected activities



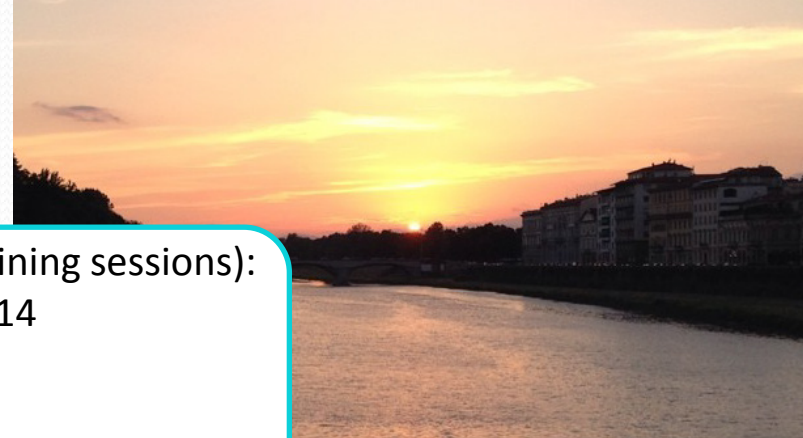
Act.	Deliverables	When
✓ 1	D1.1 Catalogue of data sources and tools D1.2 Priorisation list of sub-basins	T0+3 T0+3
✓ 2	D2.1 Repository of data sets D2.2 Assessment of data availability	T0+6 T0+6
✓ 3	D3.1 1 <sup>st</sup> draft water flow diagrams and associated SEEA-W tables D3.2 Geo-referenced database for water accounts	T0+8 T0+9
✓ 4	D4.1 Water efficient targets for future revisions Arno RBMP	T0+12
✓ 5	D5.1 Water account tables D5.2 Final report	T0+15 T0+15
✓ 6	D6.1 Project leaflet D6.2 Compendium of lessons learnt D6.3 Detailed list of dissemination activities, including project presentations during events	T0+3 T0+15 T0+15

Deliverables available online at <http://pawa.emwis.net>

# 1. Setting the Scene at Arno RBD Level

Inception workshop and training on  
SEEA-Water and ECRINS

- 4 Stakeholder WS (incl. 2 Training sessions):
- ✓ Florence, 20–21 March 2014
  - ✓ Florence, 02 July 2014
  - ✓ Rome, 01 December 2014
  - ✓ Florence, 30 March 2015 (Final WS)



Inventory and description of existing  
data sources and tools

Distribution point  
Spatial and time extension  
Quality level  
Supplementary info  
...

Identification of sub-basins where WAs  
will have the best potential

Bisanzio valley  
Chiana valley  
Pisa area



## 2. Data Collection

Matching of the existing datasets  
with SEEA-Water data structure

Repository of all necessary datasets – from  
several data providers at local, regional and  
national level – and pre-processing of data

Metadata catalogue  
INSPIRE/ISO 19115 compliant  
(→ Act. 3: Geo-referenced DB)

Two repositories on <ftp.isprambiente.it>  
one for internal use and one for public  
dissemination (**pawapub / PUB38h76**)

### A. Physical use table (*physical units*)

From the environment	<ol style="list-style-type: none"><li>1. Total abstraction (= 1.a + 1.b = 1.i + 1.ii)<ol style="list-style-type: none"><li>1.a. Abstraction for own use</li><li>1.b. Abstraction for distribution<ol style="list-style-type: none"><li>1.i. From Inland water resources:<ol style="list-style-type: none"><li>1.i.1. Surface water</li><li>1.i.2. Groundwater</li><li>1.i.3. Soil water</li></ol></li><li>1.ii. Collection of precipitation</li><li>1.iii. Abstraction from the sea</li></ol></li></ol></li></ol>
Within the economy	<ol style="list-style-type: none"><li>2. Use of water received from other economic units <i>of which:</i><ol style="list-style-type: none"><li>2.a. Reused water</li><li>2.b. Wastewater to sewerage</li></ol></li><li>3. Total use of water (= 1 + 2)</li></ol>

## 2. Data Collection

Matching of the existing datasets  
with SEEA-Water data structure

Repository of all necessary datasets – from  
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national level – and pre-processing of data

Provider	Main activity	Type of data sets
Nuove Acque S.p.A. Publiacqua S.p.A. Acque S.p.A. Gida SpA, etc.	Water Supply systems and wastewater management	Water abstraction Water supply Wastewater discharge Treated Wastewater supplied for reused
Provincia di Firenze, Arezzo, Prato, Pistoia, Pisa, Siena, Livorno, Lucca	Local government	Water abstraction Water levels (surface and groundwater)
Autorità Idrica Toscana	Water supply government	Water demand data
ARBA	River basin organisation	River discharge Surface and ground water balance Results from models
Regione Toscana	Local government	Climatic data
ISTAT	National Institute of Statistics	Water supply networks leakages Population / GDP (not yet exploited)

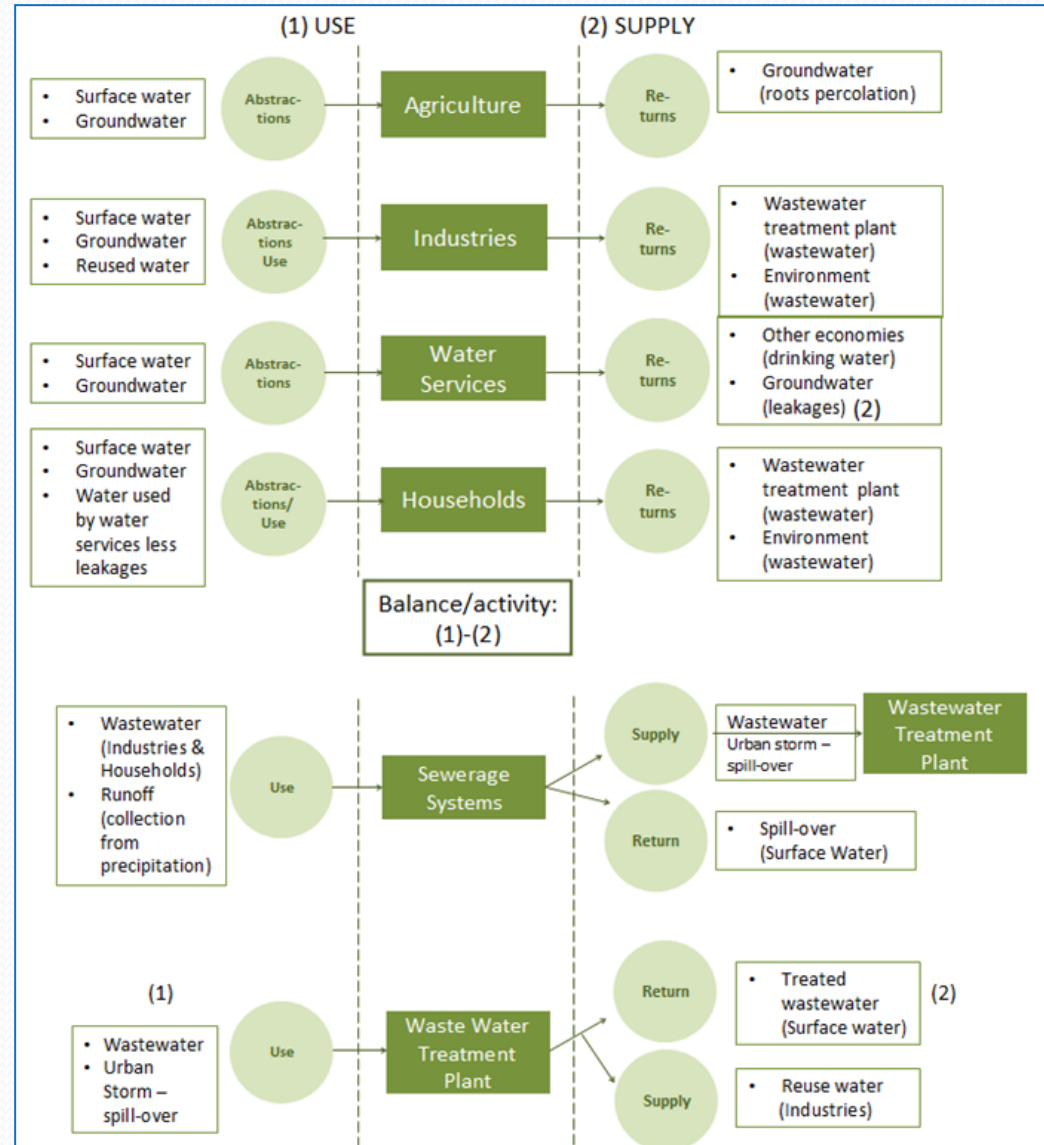
# 3. Building Water Accounts (SEEA-Water)

Production of water flow diagrams for each sub-basin in cooperation with local stakeholders

Building a geo-referenced db (water resource availability & use)

Processing SEEA-Water visualization outputs

Computing and validating SEEA-Water tables (1999-2013)



# 3. Building Water Accounts (SEEA-Water)

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The screenshot displays the GeoNetwork OpenSource web interface. The top navigation bar includes links for Home, Administration, Contact us, Links, About, and Help. The user is logged in as 'Pawa Utente'. The main content area shows search results for 'pawa'. The search criteria are 'WHAT? pawa' and 'WHERE?'. The results list 'GEODATABASE PAWA' with an abstract 'Geodatabase progetto PAWA', keywords 'water account, pawa', schema 'iso19139', and extent '10.26 42.94 12.18 44.11 2014-10-06 2015-03-31'. The interface also shows a map of the region, a search bar, and various metadata and action buttons.

GeoNetwork  
OpenSource  
Geographic data sharing for everyone

Home | Administration | Contact us | Links | About | Help | English | User: Pawa Utente | Logout

Simple Search | Advanced Search | Show map

WHAT?  
pawa

WHERE?

Sort by: Relevance

GEODATABASE PAWA

Abstract: Geodatabase progetto PAWA  
Keywords: water account, pawa  
Schema: iso19139  
Extent: 10.26 42.94 12.18 44.11 2014-10-06 2015-03-31

Metadata | Create | Edit | Delete | Other actions | Owner: pawa

Applications  
Audio/Video  
Case studies, best practices  
Conference proceedings  
Datasets  
Directories  
Interactive resources  
Maps & graphics  
Other information resources  
PAWA  
Photo

IDENTIFICATION INFO

Title	GEODATABASE PAWA
Date	2014-01-06T00:00:00
Date type	Creation: Date identifies when the resource was brought into existence
Presentation form	Digital map: Map represented in raster or vector form





# 3. Building Water Accounts (SEEA-Water)

A. Physical water use table (Table III.3) [m3]		Activities						Households	Rest of the world (exports water)	Total
		Agriculture	Industry	35	Water Services	Sewerage	WWTP			
From the environment	1.a Abstraction for own use	18 539 762	3 728 788			25 278 831		47 547 381	4 229 734	51 777 114
	(Type of use)									
	Hydroelectric power generation									
	Irrigation water	18 539 762						18 539 762		18 539 762
	Mine water									
	Urban run-off (urban storm water)					25 278 831	15 167 299	25 278 831		25 278 831
	Cooling water									
	Other									
	1.b Abstraction for distribution				5 165 185			5 165 185		5 165 185
	1.i From inland water resources	18 539 762	3 728 788		5 165 185			27 433 735	4 229 734	31 663 468
	Surface water	4 869 762	1 728 788		1 895 185			8 493 735	309 734	8 803 468
	Groundwater	13 670 000	2 000 000		3 270 000			18 940 000	3 920 000	22 860 000
Soil water										
1.ii Collection of precipitation					25 278 831	15 167 299	25 278 831		25 278 831	
1.iii Abstraction from the sea										
1. Total abstraction (1.a+1.b(=1.i+1.ii+1.iii))	18 539 762	3 728 788		5 165 185	25 278 831		52 712 566	4 229 734	56 942 299	
Within the economy	2. From other economic units	-	-		-	6 310 475	21 477 773	27 788 248	4 235 452	32 023 699
	Water services								4 235 452	4 235 452
	Recycle/Reused water									
	Wastewater to sewerage					6 310 475	6 310 475	6 310 475		6 310 475
	Desalinated water									
3. TotalA (1+2)	18 539 762	3 728 788		5 165 185	31 589 305.4	21 477 773.1	80 500 813	8 465 185	88 965 998	

Processing SEEA-Water visualization outputs

China 2012 Physical Supply and Use Table: Use

Computing and validating SEEA-Water tables (1999-2013)

# 3. Building Water Accounts (SEEA-Water)

B. Physical supply table (Table III.3) [m <sup>3</sup> ]		Activities						Households	Rest of the world (Imports water)	Total
		Agriculture	Industry	35	Water Services	Sewerage	WWTP			
Within the economy	4. To other economic units		1 864 394		4 235 452	21 477 773	-	6 099 846	4 446 081	10 545 926
	4.a Reused water						-			-
	4.b Wastewater to sewerage		1 864 394			21 477 773		1 864 394	4 446 081	6 310 475
	4.c Desalinated water									
Into the environment	5. Total returns (=5a+5b)	3 707 952	745 758		929 733	10 111 532	21 477 773	36 972 749	3 172 300	40 145 049
	Hydroelectric power generation									
	Irrigation water	3 707 952						3 707 952		3 707 952
	Mine water									
	Urban run-off (storm water)					10 111 532	15 167 299	25 278 831		25 278 831
	Cooling water									
	Losses in distribution because of leakages				929 733			929 733		929 733
	Non treated wastewater		745 758			10 111 532		10 857 290	3 172 300	14 029 590
	Treated wastewater						21 477 773	21 477 773		21 477 773
	Other									
	5.a To inland water resources (=5a.1+5a.2+5a.3)	3 707 952	745 758		929 733	10 111 532	21 477 773	36 972 749	3 172 300	40 145 049
5a.1 Surface water					10 111 532	21 477 773	31 589 305		31 589 305	
5a.2 Groundwater	3 707 952			929 733			4 637 686		4 637 686	
5a.3 Soil water										
5b To other resources										
6. TotalB (4+5)		3 707 952	2 610 152		5 165 185	31 589 305	21 477 773	64 550 367	7 618 381	72 168 748
7. Consumption		14 831 810	1 118 636		-	-	-	15 950 446	846 804	16 797 250
7a Losses in distribution (evap. Or malfunctioning meters)		12 050 845								12 050 845

Processing SEEA-Water visualization outputs

China 2012 Physical Supply and Use Table: Supply

Computing and validating SEEA-Water tables (1999-2013)

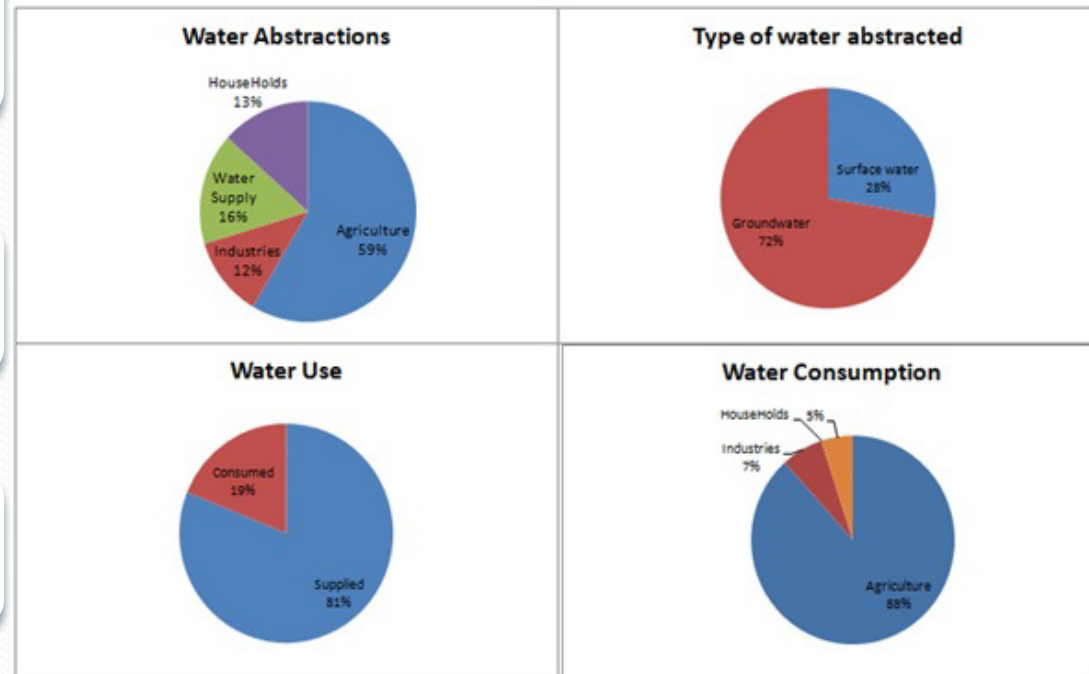
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Production of water flow diagrams for each sub-basin in cooperation with local stakeholders

Building a geo-referenced db (water resource availability & use)

Processing SEEA-Water visualization outputs

Computing and validating SEEA-Water tables (1999-2013)



Chiana 2012: Physical Supply and Use Accounts (56.94 Hm<sup>3</sup> abstracted)

## 4. Optimisation of Measures

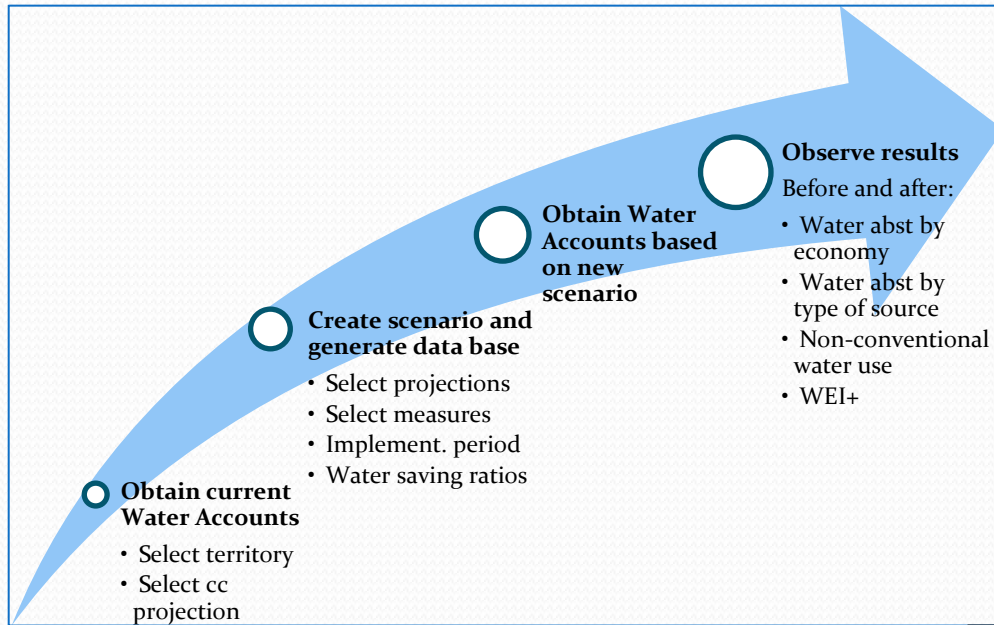
Identify suitable measures for the selected sub-basins and estimate water savings and implementing costs

Elaborate prospective scenarios based on various combinations of measures and preparing the visualization outputs for each scenario

Define water efficiency targets during a participatory workshop with local stakeholders using the output of proposed scenario

Name of measures	Impacts	Secondary impacts
1. Sensitization campaign	Water supply services reduce abstractions	
2. Household devices	Water supply and HH reduce abstractions	
3. Reduction leakages	Water supply reduce abstractions and reduce leakages, water services to households is constant	Variable of leakages
4. Desalination	Water supply services reduce abstraction	
5. Irrigation techniques	Less water abstracted by agriculture	i) Irrigation losses (to groundwater) ii) Evaporation <sup>2</sup>
6. Reduce permits (agriculture)	Reduce irrigation abstractions, temporarily	
7. Drought resistant crops	Reduce irrigation abstractions	
8. Water recycle	Reduce irrigation abstractions	
9. Sensitization campaign	Reduce industry abstractions	
10. Industrial water reuse	Reduce industry abstractions	
11. Sensitization campaign	Reduce rural household abstractions	
12. Reduce permits (households)	Reduce rural household abstractions, temporarily	
13. Green measures	Reduce rural households abstractions	
14.a Increase prices irrigation borehole	Irrigation reduce abstractions, temporarily	
14.b Increase prices rural borehole	Reduce rural household abstractions, temporarily	
15. Rehabilitation aquifers	Increase variable of outflow discharge	Increase renewable water resources
16. Reservoirs management	Increase variable of outflow discharge	Increase renewable water resources

# 4. Optimisation of Measures



→ Define a methodology to include CC trends into RBMPs to:

1. reflect the present impacts into the different aspect of the hydrological cycle; and
1. assess the sustainability of measures and interventions

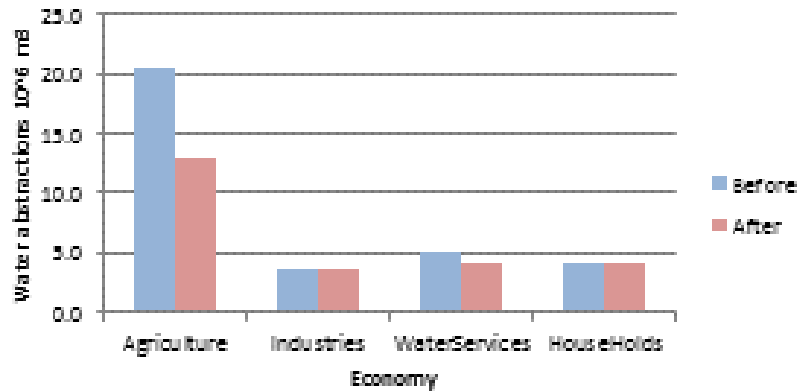
## Procedure

- 1) real scenario is compared with scenarios based on CC projections (unmet demand and WEI+ are produced for each scenario)
- 2) The worst scenario is chosen
- 3) Set of measures based on local experts' judgment are selected → new data set obtained
- 4) Results: unmet demand and WEI+ for each of the climate projections

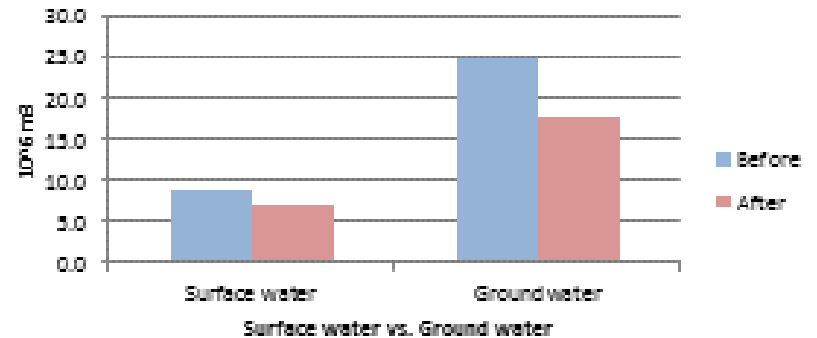
Id	Scenario	Description
1	Real	Based on measured hydrological data, 1993-2013
2	CNRM_RCP45	Synthetic hydrological data derived from 1993-2012 measured data, biased in order to copy with global circulation model output for a long-medium term temporal horizon (2070-2090)
3	CNRM_RCP85	CNRM - CM5 global climate model Météo France <a href="http://www.cnrm-game.fr/spip.php?article126&amp;lang=fr">http://www.cnrm-game.fr/spip.php?article126&amp;lang=fr</a>
4	MOHC_RCP45	Synthetic hydrological data derived from 1993-2012 measured data, biased in order to copy with global circulation model output for a long-medium term temporal horizon (2070-2090)
5	MOHC_RCP85	Met Office Hadle Center <a href="http://www.metoffice.gov.uk/">http://www.metoffice.gov.uk/</a>
6	IPSL_RCP45	Synthetic hydrological data derived from 1993-2012 measured data, biased in order to copy with global circulation model output for a long-medium term temporal horizon (2070-2090)
7	IPSL_RCP85	Institut Pierre Simon Laplace des Sciences de l'Environnement Global (IPSL) <a href="http://igcmg.ipsl.jussieu.fr/">http://igcmg.ipsl.jussieu.fr/</a>



### Abstractions per Economy

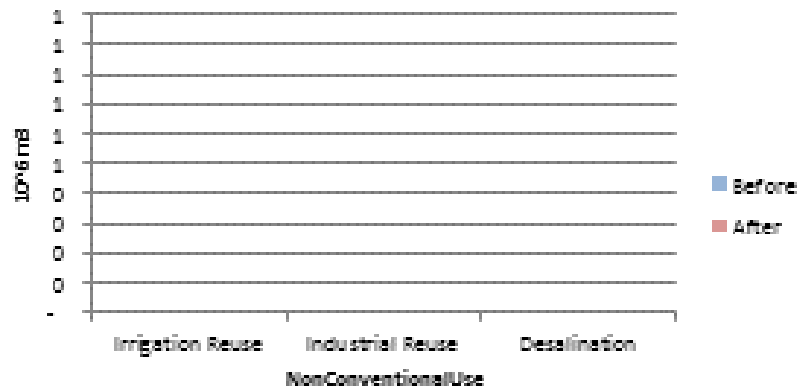


### Surface vs. Ground Water Abstractions

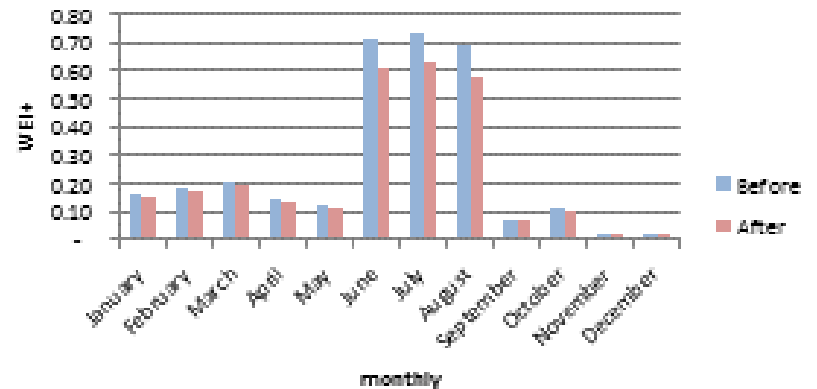


## CHIANA 2012

### Non-Conventional Water Resources



### WEI+



Results shows that measures selected by experts does not result in an unmet demand equal to 0 and it is not enough to get a WEI+ lower than 0.4.

→ A new scenario (“**MULTI**” scenario) is then created by combining new set of measures:  
 #3 Reduction of leakages needs to reach a reduction up to the 20%;  
 #8 Water reuse (Agriculture), #10 Water reuse (Industry), and #16 Reservoir Managements need to be included;

#12 Reduce permits (Households) needs to reach a reduction up to the 30% (summer period).

→ With this scenario:  
 unmet demand = 0  
 WEI+ < 0.4

1.a Subbasin: Chiana | 1.b Scenario: multi

2. Chose Measures

- DecreaseUrbanUse
  - 1. Sensitisation campagne
  - 2. Household devices
- IncreaseUrbanSupply
  - 3. Reduction leakages
  - 4. Desalination
- DecreaseIrrigationUse
  - 5. Irrigation techniques
  - 6. Reduce permits (summer season)
  - 7. Resistant crops
- IncreaseIrrigationSupply
  - 8. Water reuse
- DecreaseIndustryUse
  - 9. Sensitisation campagne
- IncreaseIndustrySupply
  - 10. Water reuse
- DecreaseRuralUse
  - 11. Sensitisation campagne
  - 12. Reduce permits (summer season)
  - 13. Green measures
- Others
  - 14.a Increase prizes Agric (summer)
  - 14.b Increase prizes Rural (summer)
  - 15. Aquifer decontamination
  - 16. Reservoirs management

4. StartYe | 5. EndYear

Measure	1993	2014
1. Sensitisation campagne	1993	2014
2. Household devices	1993	2014
3. Reduction leakages	1993	2014
4. Desalination		
5. Irrigation techniques	1993	2014
6. Reduce permits (summer season)	1993	2014
7. Resistant crops		
8. Water reuse	1993	2014
9. Sensitisation campagne		
10. Water reuse	1993	2014
11. Sensitisation campagne		
12. Reduce permits (summer season)	1993	2014
13. Green measures		
14.a Increase prizes Agric (summer)		
14.b Increase prizes Rural (summer)		
15. Aquifer decontamination		
16. Reservoirs management	1995	2014

6. Water saving %

	SurfaceW	GroundW
1. Sensitisation campagne	10	10
2. Household devices	5	5
3. Reduction leakages	20	20
4. Desalination		
5. Irrigation techniques	15	15
6. Reduce permits (summer season)	25	25
7. Resistant crops		
8. Water reuse	30	30
9. Sensitisation campagne		
10. Water reuse	20	20
11. Sensitisation campagne		
12. Reduce permits (summer season)	30	30
13. Green measures		
14.a Increase prizes Agric (summer)		
14.b Increase prizes Rural (summer)		
15. Aquifer decontamination		
16. Reservoirs management	20	20

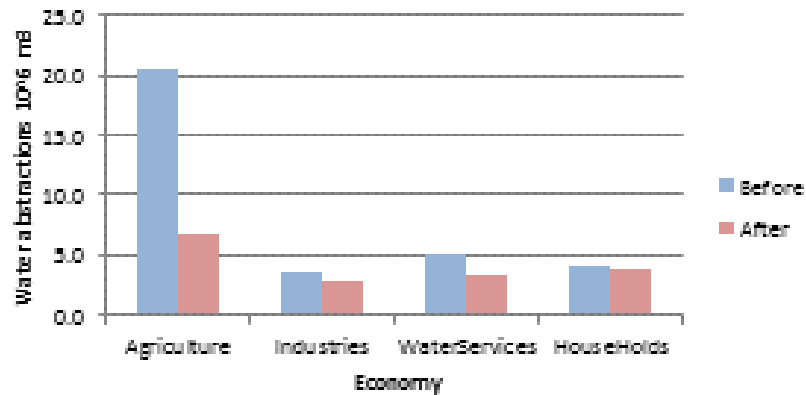
3. Growth/Increase

Population demand/year: 0.5 %  
 Irrigation demand/year: 0.5 %  
 Industry demand/year: 0.5 %  
 Climate Change: C\_ipsl-rcp85

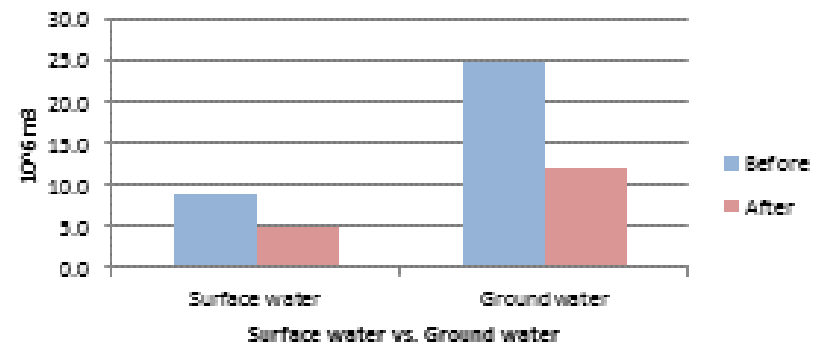
Buttons: SaveNewScenario, Obtain data set, Clear Scenario, Next

PAWA Pilot Arno Water Accounts

### Abstractions per Economy

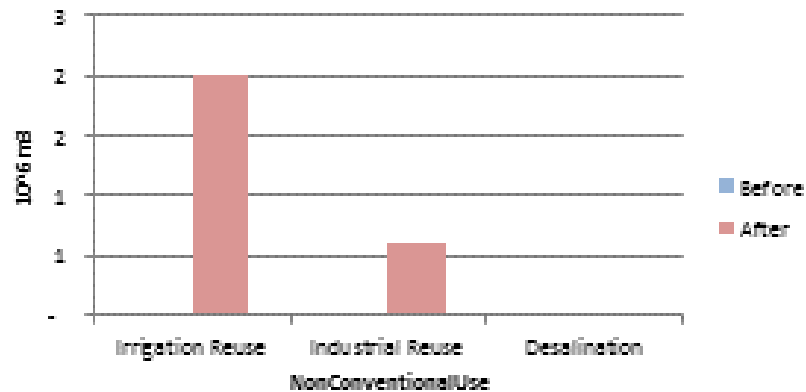


### Surface vs. Ground Water Abstractions

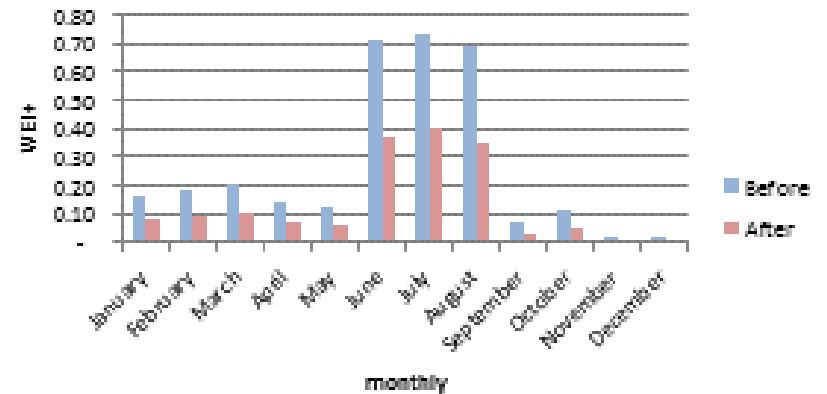


## CHIANA 2012 AFTER THE APPLICATION OF THE NEW SCENARIO

### Non-Conventional Water Resources



### WEI+



# Water efficiency objectives for RBMP

The idea is to obtain RBMP water efficiency targets by selecting the worst CC projection scenario. Targets are selected according to RBMP contents, referred to the adopted 2<sup>nd</sup> cycle of programming (December 2014).

## RBMP contents:

1. General characteristics of water body.
2. Synthetic contents of analysis for RBMP, aimed to provide links between pressures, status and PoM, and to justify the adoption of WFD exemption according to arts. 4 & 5:
  - Ecological/chemical/quantitative gap to achieve “good” status based on monitored environmental status;
  - On-going measures tackling pressures and impacts;
  - Impacting without measures’ cover by sector;
  - Measures’ integration, with indication of Key Type of Measures.

→ The latest information give the possibility to match RBMP needs (in terms of updates of PoM) with proposed water efficiency targets proposed in the PAWA project.

## Water saving targets for Chiana 2012 using the “MULTI” scenario.

Economy	Water saving targets	Non-conventional use (10 <sup>6</sup> m <sup>3</sup> )
Irrigation	↓ 70%	↑ 2.01
Water services	↓ 35%	
Industry	↓ 20%	↑ 0.6
Households	↓ 30% (summer)	

- For the agricultural sector, the resulting target is a decrease of 70% in abstractions combined with non-conventional use supply amounting to 2.01 annual hm<sup>3</sup> coming from recycled water (#8).
- The second target reduces water service abstractions by 35%.
- The third one concerns industries and it foresees a reduction of abstractions up to 20%, supplying 0.6 annual hm<sup>3</sup> by non-conventional use (#10).
- Households located in rural areas have to decrease abstractions up to the 30% at least during the summer period.



## 5. Assessment and Reporting

Provision of water accounts tables computed

Preparation of progress reports

Preparation of the final reports

Comparison of water balanced developed at EU level with SEEA-W tables developed during the project



## 6. Dissemination

Leaflet

Dedicated web space on ARPA, ISPRA and EMWIS

Circulating information on activities & results using several communication channels

Coordination and concertation meetings organized by DG ENV

Attendance to national and international workshops

Compendium of good practices

<http://pawa.emwis.net>

ISPRA & ARBA websites

- [pawa@isprambiente.it](mailto:pawa@isprambiente.it)
- PRU€ bulletins
- SEMIDE/EMWIS newsletters
- [PAWA @ facebook](#)
- IDRA14, OECD, etc.
- EU CSI WG Meetings



## After PAWA...

PAWA results are being used to update the Northern Apennines RBMP; not only used in relation to the water bodies located in the 3 test areas but also being gradually applied to all bodies of the Arno Basin with the following outcomes:

1. Consistently with SEEA-Water tables, data on total abstractions that affect a water body are used, together with the assessment of the total pollution load and hydro-morphological alterations, to **quantify the gap between present water body status and the “good status” objective**.  
→ gap assessment: basis for the evaluation aiming at weighing the effects of ongoing measures and support decision making wrt new measures' selection
2. PAWA outputs and results are used in the process of evaluating the impact of ongoing measures on the estimated gap and precisely for the **quantitative apportionment of ongoing measures with respect to the reduction of abstractions for irrigation uses and their impact in terms of water savings**.

# To summarise... solutions tested by PAWA

Wide range of data producers

Metadata catalogue INSPIRE compliant

The screenshot displays the GeoNetwork metadata catalogue interface. The browser address bar shows the URL: `dati.adbarno.it/geonetwork/srv/eng/main.home`. The page header includes the GeoNetwork logo and the tagline "Geographic data sharing for everyone". The user is logged in as "Pawa Utente".

The main content area is titled "FIND INTERACTIVE MAPS, GIS DATASETS, SATellite IMAGERY AND RELATED APPLICATIONS". It shows aggregated search results for 1-10/101 items. The first result is for the "PAWA PROJECT. WATER USE. ABSTRACTION FROM INLAND WATER RESOURCES: SURFACE WATER. AGRICULTURE. PROVINCE OF AREZZO". The abstract describes water abstraction from inland water resources, surface water, for agriculture and farming. The keywords are "Abstraction, PAWA" and the schema is "iso19139". The extent is "12.38 43.15 11.38 43.88" and the creation/modification dates are "2012-01-01T00:00:00" and "2014-01-01T00:00:00". The owner is "pawa".

The second result is for the "PAWA PROJECT. WATER USE. ABSTRACTION FROM INLAND WATER RESOURCES: SURFACE WATER. AGRICULTURE. PROVINCE OF PISA". The abstract describes water abstraction from inland water resources, surface water, for agriculture and farming. The keywords are "Abstraction, PAWA" and the schema is "iso19139". The extent is "12.38 43.15 11.38 43.88" and the creation/modification dates are "2012-01-01T00:00:00" and "2014-01-01T00:00:00". The owner is "pawa".

The left sidebar contains a search bar and a list of categories: Applications, Audio/Video, Case studies, best practices, Conference proceedings, Datasets, Directories, Interactive resources, Maps & graphics, Other information resources, PAWA, Photo, Physical Samples, Registers, GeoRSS, Template for Vector data in ISO19139 (preferred!), Average monthly discharge, Average daily total radiation, Extreme daily temperature, and Cumulated daily rainfall.



# To summarise... solutions tested by PAWA

Wide range of data producers

Metadata catalogue INSPIRE compliant

Training and concertation with stakeholders and data providers





## To summarise... solutions tested by PAWA

Wide range of data producers

Homogeneous data time series

Metadata catalogue INSPIRE compliant

Training and concertation with stakeholders and data providers

Reconstruction and validation with stakeholders (but more uncertainty)

# To summarise... solutions tested by PAWA

Wide range of data producers

Homogeneous data time series

Exploitation of water accounts tables

Metadata catalogue INSPIRE compliant

Training and concertation with stakeholders and data providers

Reconstruction and validation with stakeholders (but more uncertainty)

Excel – VBA tool to generate water account tables

The screenshot shows a software window titled "Arno Water Accounts". The interface is blue with white text and buttons. It features several input fields and buttons:

- Subbasin**: A dropdown menu.
- SEEA-W Table**: A dropdown menu.
- Initialize**: A button.
- GetOpenings**: A button.
- Year [1990-2013]**: A text input field.
- ShowTable**: A button.
- Exit**: A button.
- Month**: A dropdown menu showing "January".
- Get Balance**: A button.

## To summarise... solutions tested by PAWA

Wide range of data producers

Metadata catalogue INSPIRE compliant

Homogeneous data time series

Training and concertation with stakeholders and data providers

Exploitation of water accounts tables

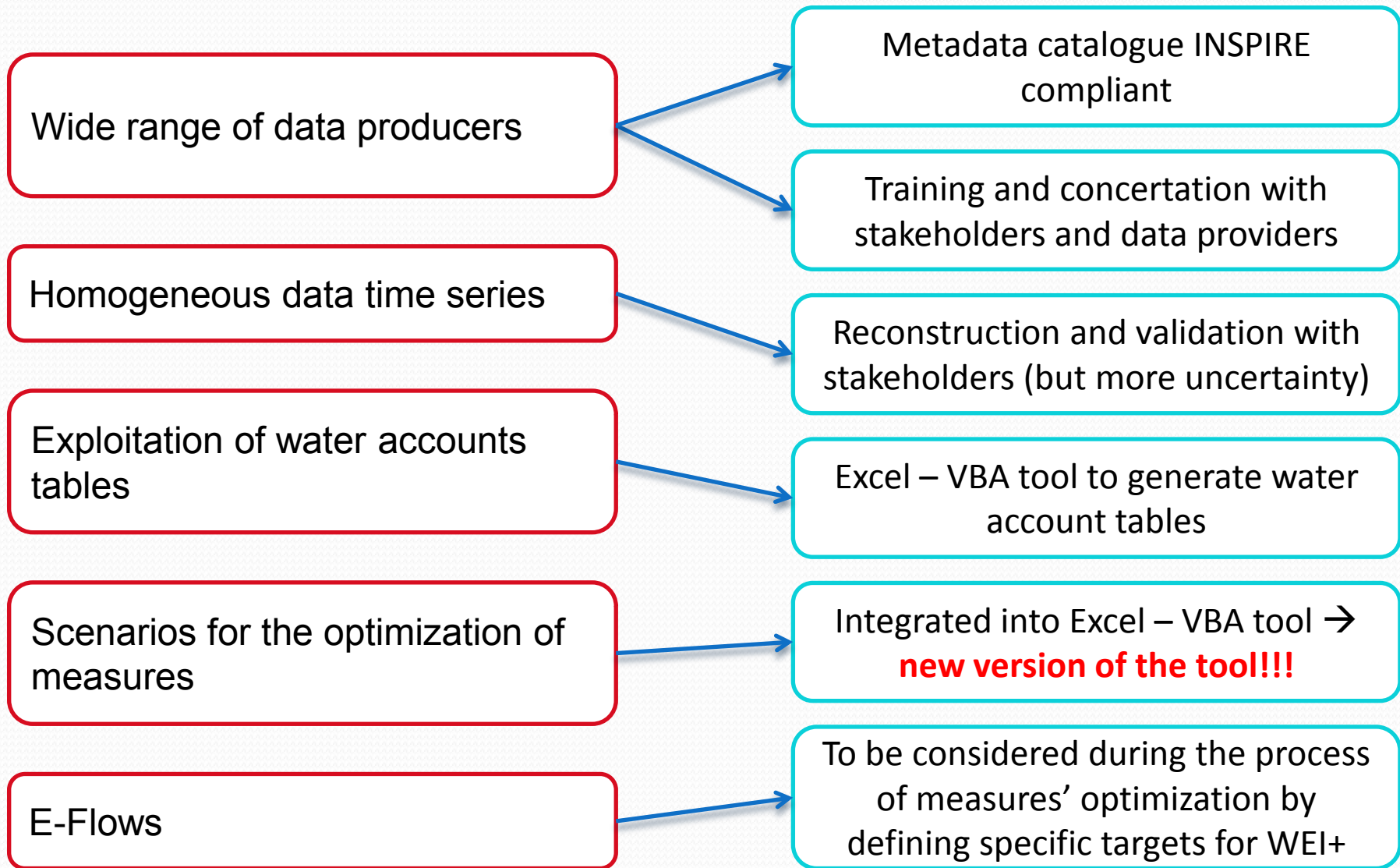
Reconstruction and validation with stakeholders (but more uncertainty)

Scenarios for the optimization of measures

Excel – VBA tool to generate water account tables

Integrated into Excel – VBA tool →  
**new version of the tool!!!**

# To summarise... solutions tested by PAWA





**Thank you for your kind attention!**

**For any further details:**  
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