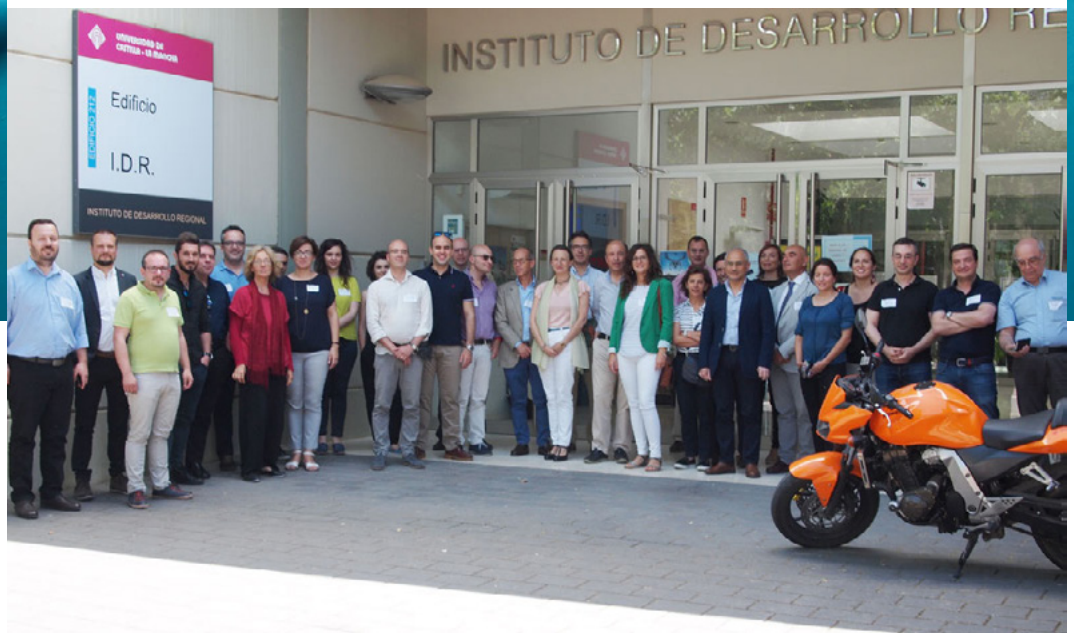
DIANA

NEWSLETTER #1

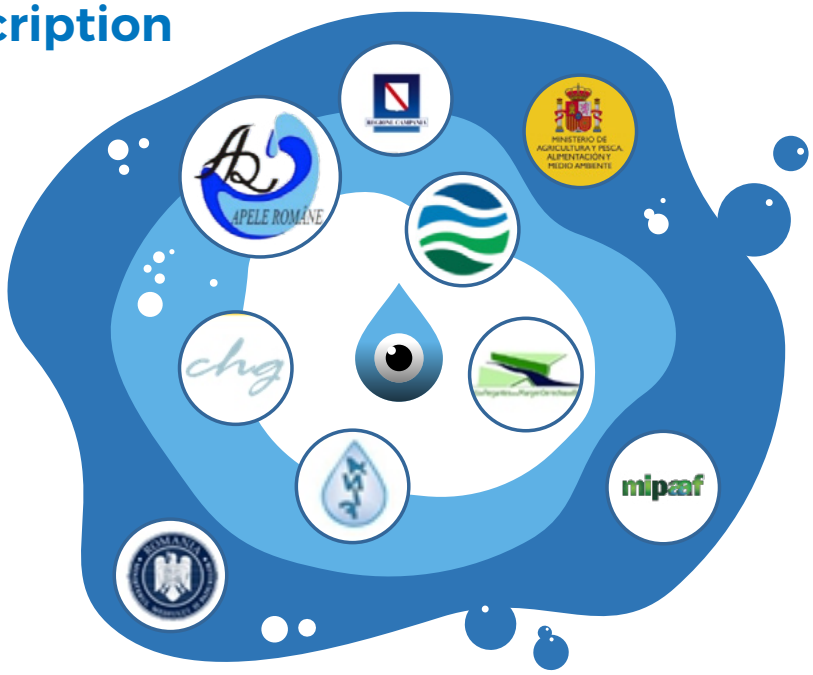
Welcome to the DIANA newsletter!

DIANA is aimed at co-designing and openly demonstrating a commercial service platform that will empower water managers and authorities to optimise the identification and inspection of non-authorised water abstractions for irrigation as well as improve their water management policies and practices, especially in extreme conditions such as drought. DIANA will leverage EO data provided by Copernicus and other data sources as well as state-of the-art models for the identification of (illegally) irrigated areas and the estimation of abstracted water volumes in order to offer a value-added suite of data products and services, that will be affordable and cost-effective.



Pilot areas brief description

- Non-authorised water abstraction monitoring
- Seasonal Drought Forecasting
- WFD Management



Spain

MAPAMA

Gualdauivir Basin Water Authority

Comunidad de Regantes de la Margen Derecha del Bembézar

Italy

MIPAAF

Campania Region

Consorzio di Bonifica del Sannio Alifano

Romania

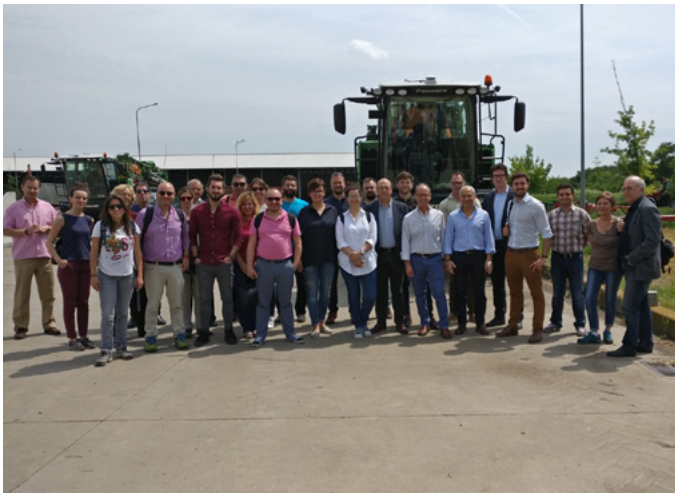
Ministry of Waters and Forests

NARW

ANIF

DIANA 3rd Project Meeting

The meeting was held on the 24th and 25th of May 2018 in Timisoara, Romania. The focus of the first day of the meeting was DIANA platform that is currently being under development. Partners discussed in detail the various elements that are part of the service platform and their integration under DIANA. The second day of the meeting was dedicated to a visit in Banat, the Romanian pilot area of the project, were partners had the chance to discuss with local stakeholders about daily operations and how DIANA could help them improve them.



Surveying the non-authorized water abstractions in Europe

Prof. Guido D'Urso , Scientific Supervisor, Ariespace S.r.l.

The actual extent of irrigated areas and corresponding irrigation amounts is difficult to assess in most countries of the World. In the driest agricultural regions i.e. around Middle East the issue has strong political implications, with growing conflicts among different users. In EU regions, statistical data acquired by means of periodical surveys, i.e. Eurostat, are meant to give a picture at the national scale, but they are rather imprecise at regional and local scales, which are the most relevant for the management of water resources in hydrographic basins.

The lack of accurate and up-to-date data is hampering the full implementation of the Water Framework Directive (WFD) and its compliance especially in Mediterranean regions. This has been highlighted in Communications from the EU Commission to the European Parliament (see for example the Com.673/2012), which have led to the imposition of additional conditionalities for the utilization of EU funds by Member States in the agricultural sector. For example, the Italian Ministry of Agriculture has adopted specific actions (Decree 31/07/2015) for monitoring irrigation areas and volumes on a regular basis to improve the compliance to the Water Directive. To this end, satellite imagery and derived information provided by EU in the context of Global Monitoring for Environment and Security (GMES) programme and more recently Copernicus, are representing the most suitable technical basis for developing tools for final users and stakeholders.

However, the governance of water resources for agriculture – especially in the Southern Europe – implies a number of criticalities at both management and political levels. As a result, the objective of a correct assessment of irrigated areas and amounts may appear as a contrast to local equilibria which have consolidated throughout many years. For this reason, it is extremely important that all the parties involved are sharing common - and as much as possible objective – information and data. This is the essential premise for a truly participatory approach to the water governance, as correctly interpreted by the WFD.

The DIANA project goes exactly in this direction, by developing tools based on Earth Observation data provided by Copernicus for quantifying on a regular basis the irrigation abstractions and delivering these data to stakeholders in a simple and intuitive way by means of the most advanced Information Technologies. Sharing data and information not only is able to reduce contrasts but also can greatly improve the awareness of the general public toward the problem of a sustainable utilization of water resources, which will become imperative in the near future era of Climate Change.

The DIANA Case Studies...

The case of Italy

Interview with Massimo Natalizio, Consorzio di Bonifica del Sannio Alifano (Italy)

Q1. What are the main "pains" that your organization is facing when implementing the water management activities?

The main challenge -and pain at the same time- is to deliver water resources for irrigation uses equally among all the end-users associated to Consortium, possibly according with the irrigators needs and saving water (recent years).

More precisely, the problem -by the side of water management- is to accept or not the request of the farmer in order to irrigate at a given moment (chosen by the farmer on the basis of his own business organization) and define the more suitable irrigation volume to be used by the farmer (or the duration in time).

The decision, of course, depends on the possibility of the irrigation network (which depends, in turn, on the use of the irrigation plant by too many farmers at the same time) to supply the farmers with the right amount of water at the best levels of water pressure that the irrigation system can offer (that's exactly what the farmer wants).

Q2. What are the main benefits that you envisage from DIANA solution?

DIANA can help Consortium to detect the irrigated fields (both with permission or non-authorized), the variety of crops planted on them and, what is essential, to estimate their crop water requirements (that is, at the moment, a crucial topic in Italy, because the calculation of irrigation requirements represents an official approved method to estimate water consumption where there are no direct measures of irrigation water volumes).

The more relevant bottleneck for this uptake is a physiological reluctance to invest money in innovative technologies.

Furthermore, the internalization of EO-based procedures (and more generally the use of spatial data by farmers and irrigation personnel) still seems to be a slow learning process in the context of direct application to agricultural practices.

Software with user-friendly interfaces are currently available to facilitate the task but the actual average level of computer literacy in the agricultural community is not yet enough for a quick diffusion of new technologies.

However, these obstacles will be overcome in the near future because, over the years, a growing number of farmers has begun to understand the importance of protecting and saving water resources (the final goal of DIANA) to achieve the common good or, more simply, to secure their profits.

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Preview of DIANA tools

DIANA is a commercial service platform that aims to empower water managers and authorities to ***optimise the identification and inspection of non-authorised water abstractions for irrigation as well as improve their water management policies and practices,*** *especially in extreme conditions such as drought. DIANA leverages* ***EO data provided by Copernicus*** *and other data sources as well as state-of-the-art models for the identification of (illegally) irrigated areas and the estimation of abstracted water volumes in order to offer* ***an affordable and cost-effective suite*** *of data products and services. DIANA is in the process of being validated in three pilot areas, i.e. Spain, Italy and Romania. The purpose of the piloting is to test the effectiveness of the project in real-life contexts and foster the acceptance of DIANA as a marketable solution with* ***three main services,*** *i.e.:*

Non-authorised water abstraction detection and monitoring for control optimisation.

The non-authorised water abstraction detection and monitoring service is the core service of DIANA. Satellite images are processed and **maps of irrigated areas** are provided to the users enabling them to detect directly which agricultural areas in their region of jurisdiction have been irrigated. The service cross-checks these maps and images with all the available information/databases on irrigable areas and registered official water rights of the region in order to **verify the existence of a water right for each specific parcel of irrigated land.** Time sequences of irrigated areas will provide users with **maps of irrigation water consumption and abstracted volumes** along with estimates of the water consumption of the specific crops cultivated in the irrigated area. By cross-checking and referring to the registry of water rights or any existing water management plan, the service will provide the user with meaningful information about water abstraction. In case the legal volume is exceeded, the user will receive an **alert via web and mobile.** The alerts provided by the DIANA system will be able to **guide and optimise field inspections.**

Seasonal drought forecast

By using seasonal climate forecast in combination with hydrological models, **drought forecasts** are provided to the users for their region of interest six months ahead. These forecasts can be used as input to update existing regional or local **drought management plans** enabling the authorities to take the needed actions in order to cope with the phenomena. The same authorities can use these forecasts to **alert farmers** of the region in order to adjust their crop production planning by selecting more

drought resistant crops. This service can also be used to **improve ecosystem management by defining sensible areas** where irrigation must not be allowed because the impact of abstraction could put at risk an ecosystem survival.

Support to the implementation and monitoring of the Water Framework Directive (WFD)

The DIANA service will allow the authorities responsible for the implementation of the WFD to have access in geospatial data such as crop water consumption, crop evapotranspiration, accumulated precipitation, etc. in their territory. This data will help them make a more accurate spatial interpolation between in-situ measurements of ground and surface water quality and quantity. This process will enable the authorities to **justify the impact of non-authorised water abstraction** to the overall quality and quantity of water resources in their region and **use this information for WFD reporting purposes.**

Upcoming Water Events

Water Efficiency Conference

Aveiro, Portugal
September 5-7

5th European Water Conference

Vienna, Austria
September 20-21

The Consortium

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