Conférence Parmenides IX – GID-CIHEAM – Bari – octobre 2021
Gestion durable des bassins versants méditerranéens face aux impacts des changements sociétaux et climatiques

Romina Lorenzetti

Irrigation investments as a measure of adaptation to drought and focus on National Recovery and Resilience Plan

Degree in Natural Sciences, Master in G.I.S. and remote sensing for geo-environmental planning, Ph.D in Agriculture Technology and Biotechnology. Research activities about digital mapping, pedometrics and proximal sensing on soil properties of agronomic and environmental interest at CREA-AA (since 2009). Studies on agriculture water management and support activities for planning/programming irrigation policies, included the development and management of DANIA at CREA-PB (since 2019).

Summary

In Italy the effects of drought events emphasize the structural territory weaknesses driving negative impacts on agricultural production, especially where irrigation practice is essential. Therefore, actions are needed to increase the irrigation agrosystem resilience to extreme climatic events, with reference to drought phenomenon, aiming to improve water resources management, reducing losses and favoring the measurement and monitoring for the quantification of the water

used and to prevent illegal water withdrawals in rural areas. The National Recovery and Resilience Plan gives an opportunity for the implementation of this strategy, by Investment 4.3 of the Mission 2 Component 4 « Investments in the resilience of the irrigation agrosystem for the better management of water resources » The proposed irrigation investments are configured as a measure of adaptation of the agricultural sector to climate change, increasing the resilience of the agro-ecosystem to drought events.

Key words : drought phenomenon, irrigation investements, resilience

Communication

In recent decades climate change, in particular drought phenomena, are affecting all Europe, even in areas where droguth events are not so common in the past decades. This situation has led EU Member States provide actions in order to assess water saving and land protection mainly through interventions aimed at ensuring efficient resource use and to increase water availability. Moreover, adequate planning and management of these systems also contributes to the achievement of the Sustainable Development Goals of the 2030 Agenda, especially Goal 6 (Ensure availability and sustainable management of water and sanitation for all) and Goal 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). The issue of the water use in agriculture has always played a central role in investment policies. With reference to the irrigation sector and territorial protection, the Ministry of Agriculture, Food and Forestry Policies (MiPAAF) has launched a long-term program strategy aimed at promoting investments for the risks reduction in agriculture related to water scarcity and hydrogeological instability, based on the adaptation of infrastructures for irrigation and land defense purposes. Mipaaf has dedicated and will dedicate many resources to these topics, also in coordination with other Ministries, using several plans and funding programs currently in place, and supported with national and EU funds. Other funds are currently being allocated for irrigation projects carried out by the consortia as the National Plan of interventions in the water sector, National Recovery and Resilience Plan, financed with next generation EU funds, as part of the proposed measure of the MIPAAF, Budget Law 2021 - Law 178/2020 - financing of investments for national infrastructure development: Currently, a projects list which can be financed with these resources has not yet been drawn up and FSC funding line 2021-2027, on which new funds could be made available with the new 2021-2027 programming, but it needs to wait for the funds allocation on the various strategic objectives and related to thematic areas and the definition of the operational plans to know the specifics actions financed. As above mentioned, investment 4.3 concerns interventions

aiming to improve water resource management and reduce losses, encourage the measurement and monitoring of uses on collective networks, to prevent the illegal use of water in rural areas, to increase the resilience of the irrigation agro-ecosystem to extreme climatic events, with particular reference to drought events. In order to achieve these objectives, infrastructural interventions on the networks and irrigation systems and on the related digitalisation and monitoring systems will be financed (conversion of irrigation systems towards higher efficiency systems, the adaptation of distribution networks in order to reduce losses, installation of technologies for the efficient water use (meters and remote control).

For taking NRRP payment, it needs to compliance with measures for progress towards a reform or investment, specifying a stage to be reached by a certain date, particularly milestone (qualitative results and details desirable content and characteristics) and targets (quantitative results). Projects that meet a series of technical criteria were choose, as projects with an high level of construction and timing of project implementation, projects with greater territorial strategic importance, relevance with the actions funded by investment 4.3 and effectiveness in achieving the targets, contribution to the objectives of the Water Framework Directive (WFD) and the Impact on the environmental objectives referred to in the guidelines for the NRRP compilation and the regulation UE 2020/852 (Taxonomy Regulation). Particularly, the projects to be financed must respect a fundamental principle - DNSH, "Do No Significant Harm, based on a recent cornerstone of European legislation, namely the taxonomy for sustainable finance where in Article 17 of Taxonomy Regulation, the concept of "significant damage" is defined for six environmental objectives.

The investment 4.3 as a whole has to comply to the DNSH. In particular, with respect to ***the adaptation to climate change***, the measure increases efficiency in the water resources use and reduces losses, better addressing water scarcity. A network without unwanted losses should be able to assure a higher level of water availability even when withdrawals are forced to be reduced during water crisis events. Combining these with the disincentive to create new irrigated areas, the result will be that the water saved will guarantee a better supply, especially in times of water scarcity. The installation of meters and remote control systems will reduce losses and monitoring of uses. As consequence, it allow to better use the current system of water pricing (since applying full cost recovery first requires quantification of water withdrawals in order to assess associated charges), in order to encourage more sustainable water use. Moreover, the infrastructures for irrigation contribute to creating and safeguarding the rural landscape and the irrigated agro-

ecosystem. Generally, irrigation and reclamation canals should not be considered invasive elements on the territory, but they could contribute to keep alive the ecosystems connected to the water resource. For example, efficiency measures and the related water saving could contribute to maintaining the level of volumes in the supply sources, supporting their environmental quality. Furthermore, the biodiversity could be supported managing canals by means of tree-lined strips.

Conclusion:

The proposed investment 4.3 responses in a positive way to the DNSH request, particularly it gives adaptation solutions that reduce the risk of adverse effects of climate change on agricultural activity without increasing the risk of adverse effects on people or nature and the possibility to better address water scarcity, aggravated by the risks linked to the climate change, namely drought. A network without losses should be able to assure a higher level of water availability even when withdrawals are forced to be reduced during water crisis events.

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Sustainable management of Mediterranean watersheds in the face of societal and climate change impacts

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Bari, 19-21 October 2021

Raffaella Zucaro
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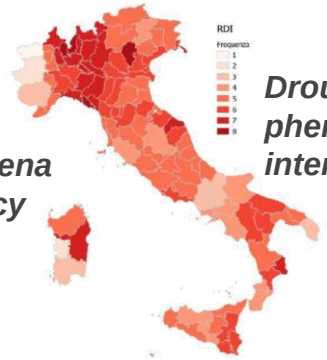
Center for Agricultural Policies and Bioeconomy
e-mail: raffaella.zucaro@crea.gov.it

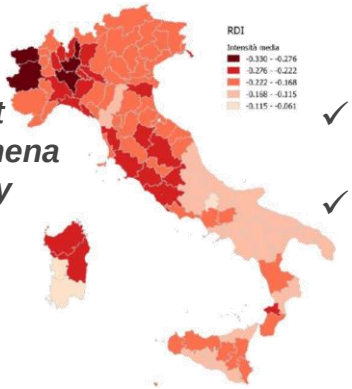
European and National investments

Reconnaissance Drought Index (RDI)

for Italian Provinces (2008 – 2017)



Drought phenomena frequency



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- ✓ *High intensity particularly concerned the Regions of the Center and North; the high frequency of the phenomenon is also found for the South and the Islands.*

Investments to assess water saving and land protection through specific interventions aimed at increasing water availability and ensuring efficient use of the resource

Efficient water use

- Building public irrigation infrastructures on water distribution networks
- promotion of more efficient water pipes,
- introduction of non-traditional sources,
- recovery of reservoir volumes

(greater and more constant availability of water for irrigation)

Land protection

Extraordinary maintenance of canals and minor water networks

The right planning of these interventions also contributes to the achievement of the Sustainable Development Goals of the 2030 Agenda, which since 2015 have been guiding policies and their implementation

Ensure availability and sustainable management of water and sanitation for all

- **6.4** By 2030 increase water use efficiency and ensure freshwater supplies;
- **6.6** By 2020, protect and restore water-related ecosystems

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

- **9.1** Develop sustainable, resilient and inclusive infrastructures
- **9.4** By 2030, upgrade all industries and infrastructures for sustainability

MIPAAF Strategy

Water use in agriculture has always played a central role within the investment policies

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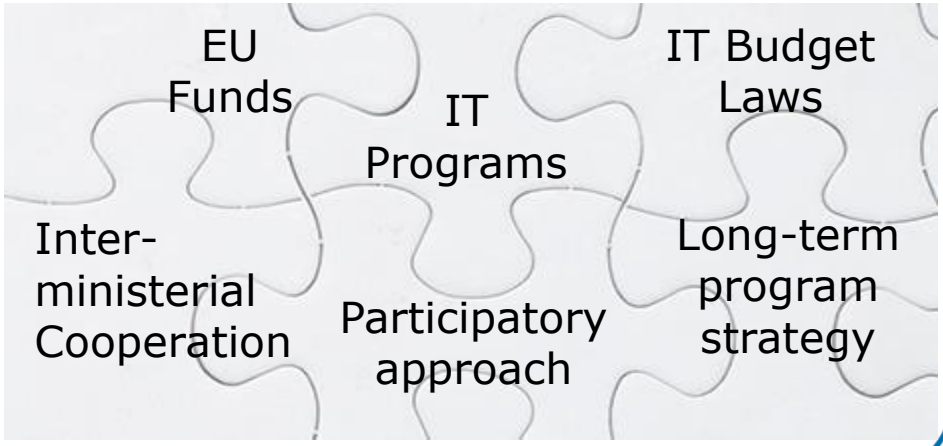
LONG-TERM PROGRAM STRATEGY on irrigation sector and land protection

- aimed at **promoting investments for the reduction of risks in agriculture related to water scarcity and hydrogeological instability**;
- based on the **adaptation of infrastructures** for irrigation and land defense purposes

✓ Carried out by the **coordination of several resources (**national and EU funds), also in concert with other Ministries, drawing on various financing plans and programs currently in place.



Investments in planning phase

Initiated by MIMS, MIPAAF and MiTE participate as competent administration	New programming of the National Plan of interventions in the water sector 2020-2029	€ 860M of which € 540M for sezione “invasi”
NRRP - National Recovery and Resilience Plan	Investments in the resilience of the irrigation agro-system for a better management of water resources	€880M (of which 520 additional of the NRRP)
Budget Law 2021 - Law 178/2020 - financing of investments for national infrastructure development	Currently, a projects list which can be financed with these resources has not yet been drawn up	€ 440M
National Development and Cohesion Fund (DCF)	Development and Cohesion Plans 2021-2027	€?

Investment 4.3: Investment in the resilience of the irrigation agrosystem for the better management of water resources

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FRAME

Mission M2 – Green revolution and ecological transition (59,47 billion euros)
Component C4 - "Protection of land and water resource to support the ecological transition for the agricultural sector " (15,06 billion euros)

RATIONALE

- Efficient water use in agriculture;
- Complementarity with the investments of the same component

BENEFICIARIES

- Local irrigation agencies

OBJECTIVES

- Improve water resource management and reduce losses;
- Encourage the measurement and monitoring of uses on collective networks (prerequisite for completing the introduction of water pricing policie based on the water volumes for an efficient water use in agriculture)
- Reduce illegal water withdrawals in rural areas ;
- **Increase the resilience of the irrigation agro-ecosystem to extreme climatic events, with particular reference to drought events**.

PROPOSED INTERVENTIONS

- conversion towards higher efficiency irrigation systems;
- adaptation of distribution networks in order to reduce losses;
- installation of technologies for the efficient water use (meters and remote control).

Investment 4.3 time schedule

RESPECT FOR MILESTONE AND TARGET ARE NECESSARY REQUIREMENTS TO BE ABLE TO RECEIVE THE AMOUNTS PROVIDED

MILESTONE & TARGET

Measures for progress towards a reform or investment, specifying a stage to be reached by a certain date

MILESTONE

(qualitative results)

- Approval of selection criteria (done)
  (Q2 – June 2021)
- Projects selection
  (Q3 September 2021)
- Concession decree (Q3 September 2022)
- 100% of financed project with official award of the tender (Q4 December 2023)

TARGET

(quantitative results)

1) Increase in the % of withdrawal sources equipped with meters

- Baseline 24%
- Intermediate target 29% (Q4 2024)
- Final target 40% (Q2 2026)

2) Increase in the % of irrigated area with an efficient irrigation resource management

- Baseline 8%
- Intermediate target 10% (Q4 2024)
- Final target 15% (Q2 2026)*

Principles underlying the interventions selection

Principles eligibility criteria and priorities identification of projects

- Design level and timing of project implementation consistent in NRRP;
- Territorial strategicity - facilitating the identification of major projects, optimizing the results of the selective effort;
- Relevance with the actions funded by investment 4.3 and effectiveness in achieving the targets;
- Compliance with the volume monitoring requirements;
- Impact on the environmental purposes indicated in the guidelines for the NRRP compilation and the regulation UE 2020/852 (**Taxonomy**) .

DNSH, "Do No Significant Harm"

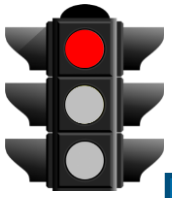
Reg. UE 2020/852 ***art. 17 Taxonomy***: **«Significant damage» of an activity for 6 environmental objectives**

DNSH - "Do No Significant Harm"

1) To the mitigation of climate change	1) No greenhouse gas emissions expected;
2) To the adaptation to climate change	2) Reduced risk of adverse effects of climate change on agriculture without increasing the risk of adverse effects on people or nature *(Investment 4.3 increases water use efficiency, reduces losses **without the creation of new irrigated areas**, assuring higher resilience of irrigated areas to drought events)*
3) To sustainable use and protection of water resources	3) Contribution to the good status of the water bodies in quantitative terms (*no one new irrigated area, new dam, expansion of existing dam will be carried on*)
4) To circular economy	4) Project in accordance with european, national, and regional waste legislation Union
5) To the prevention and reduction of pollution	5) Adoption of all precautions provided by the law
6) To the protection and restoration of biodiversity and ecosystems	6) Compliance with national requirements for the Environmental Impact Assessment and the analysis of Impact Assessment under Habitat directive 92/43/CEE will be required. Moreover the infrastructures for irrigation contribute to creating and safeguarding the rural landscape and the irrigated agro-ecosystem

Eligibility and Selection criteria

MIPAAF DECREE n. 0299915 30 June 2021 -
Approval of criteria for eligibility and selection of projects
submitted by DANIA (National Database of Investment for Irrigation and Environment)



Eligibility criteria
<u>without which it is not possible to access the selection</u>

Main focus:

- Typology
- Level of design,
- timing of project

consistent with NRRP

Selection criteria
<u>to be able to rank among the projects</u> in case of requests exceeding the budget

Main focus:

Greater relevance to the impact on environmental objectives

Priority is given to projects able to ensure a greater contribution for:

- the WFD purposes
- the achievement of the established targets
- the 2' environmental objective of EU taxonomy *(leading to an improvement of the adaptive capability in particular against the risk of drought*)
  - *Level of potential desertification;*
  - *Recurrence drought events (last 15 years);*
  - *Contribution to water saving*
  - *Other aspects of environmental protection.*

DANIA For
✓ Project submission
✓ Ckeck of Criteria

Positive response of the Investment 4.3 to climate change

A better efficiency in water use combinated to the disincentive to create new irrigated areas result in saving an amount of water that:

- ✓ *will guarantee a better supply, especially in times of water scarcity*
- ✓ *or will remain in the water body.*

The installation of meters and remote control systems, **will improve a correct measurement and monitoring of uses**

allow to better use the current system of water pricing (application of a full cost recovery first requires quantification of water withdrawals in order to assess associated charges)

will give a contribute to reduce illegal water withdrawals in rural areas.

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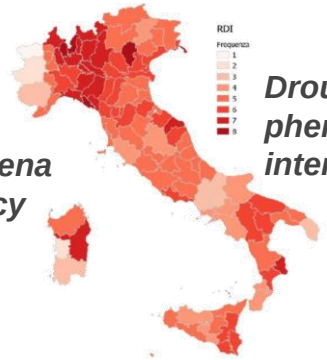

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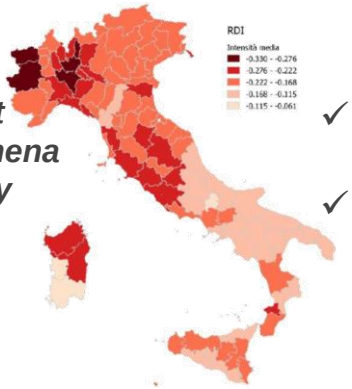

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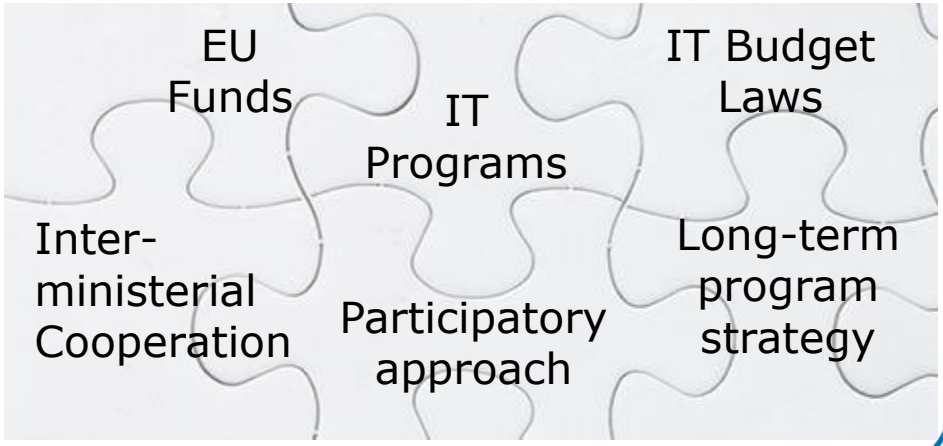

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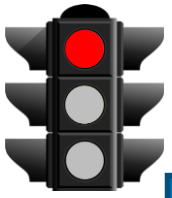

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