



PhD in INGEGNERIA AMBIENTALE E DELLE INFRASTRUTTURE / ENVIRONMENTAL AND INFRASTRUCTURE ENGINEERING - 39th cycle

Research Area n. 1 - Water Science and Engineering

**PNRR 118 INTERDISC Research Field: THE HYDROLOGIC MEANING OF "THE ECONOMIC
VOLUMETRIC WATER VALUE INDICATOR" AND IMPACTS ON THE IRRIGATION
EFFICIENCY UNDER DIFFERENT CLIMATIC CHANGES**

Monthly net income of PhDscholarship (max 36 months)

€ 1195.5

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

**Motivation and objectives of the research
in this field**

Sustainable Development Goal (as defined by United Nations) linked to this research: **Responsible consumption and production.**

Irrigation water seems to have small impact on the economic balance of farms and its cost at hydrologic river basin scale is complex to evaluate. Indeed, the cost of water in term of supply and distribution is for several reasons mainly supplied by public authority and it is neglectable respect to the cost that farmers have to invest for preparing fields for the next crop (10^3 10^4 euro/hectare). The thesis will evaluate the economic impact of irrigation water on the farm business not only as the cost of water volume per irrigation season, but as the availability of irrigation volume at the right time and in the right amount in the farmer business plan. This water availability is conditioned by the type of irrigation practices and management respectively at field and district scale and by the climate and its variation. Water availability becomes crucial for the farmer production because its absence transforms the investment euro/hectare for field preparation in an economic losses. The thesis will then



	discuss the different impact of the volumetric water cost (euro/hectare) and the volumetric water value. This latter can contribute to a more parsimonious use of water with positive impact on irrigation efficiency.
Methods and techniques that will be developed and used to carry out the research	The thesis will discuss how the “economic water value indicator” is sensible to the irrigation practices and in particular to the precise irrigation models, to the hydraulic distribution techniques among several irrigation consortia in Italy under different climate conditions. Methods employed include hydrological models, and data acquisition through monitoring stations, specific field campaigns and remote sensing.
Educational objectives	The PhD project will provide to the candidate: methodological competences at both theoretical and applied levels in hydrological modelling and water value assessment; capabilities to interact with people of diverse background; problem setting and solving capabilities.
Job opportunities	Academy; irrigation consortia; river basin authorities; companies in agricultural sector.
Composition of the research group	1 Full Professors 2 Associated Professors 2 Assistant Professors 3 PhD Students
Name of the research directors	Marco Mancini and Francesca Torrieri

Contacts	
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--



Scholarship Increase for a period abroad	
Amount monthly	597.75 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	--
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	US Department of Agriculture - Agricultural Research Service (USDAARS, https://www.ars.usda.gov/) - Wageningen University (https://www.wur.nl/en.htm)
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<u>Educational activities</u> (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): approximately 1630,00 euros per PhD candidate per year, on average. <u>Teaching assistantship</u> (availability of funding in recognition of support to teaching activities by the PhD student): there are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations. <u>Computer availability and desk availability</u>: individual assignment for the entire career.