

H2020-SC5-01-2017



Turning climate-related information into added value for traditional **MEDiterranean Grape, OLive and Durum wheat** food systems

D6.4

Science-based knowledge relevant for Climate related Policies



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776467.

DOCUMENT STATUS SHEET

Deliverable Title	Science-based knowledge relevant for Climate related Policies	
Brief Description	This first report draws key elements of identified policy makers interests on MED-GOLD outcomes and describes a series of planned activities to produce relevant climate science-based information for related policies.	
WP number	WP6	Communication and exploitation of the MED-GOLD value chain
Lead Beneficiary	CNR	
Contributors	Massimiliano Pasqui – CNR, Edmondo di Giuseppe – CNR	
Creation Date	20/11/2019	
Version Number	1.1	
Version Date	28/11/2019	
Deliverable Due Date	30/11/2019	
Actual Delivery Date	30/11/2019	
Nature of the Deliverable	R	<i>R - Report P - Prototype D - Demonstrator O - Other</i>
Dissemination Level/ Audience	PU	<i>PU - Public PP - Restricted to other programme participants, including the Commission services RE - Restricted to a group specified by the consortium, including the Commission services CO - Confidential, only for members of the consortium, including the Commission services</i>



REVISION HISTORY LOG

Version	Date	Created / Modified by	Pages	Comments
1.0	25-11-2018	CNR	14	Initial Draft
1.1	27-11-2018	CNR	15	Initial Draft

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EXECUTIVE SUMMARY

This document reports the first round of efforts towards a definition of science-based knowledge for climate related policies. It is based on the evidence of policy makers interests and needs that emerged during the stakeholders sectorial workshops and a participative discussion in the framework of a dedicated workshop meeting on long-term projections, held in Roma in late November 2019.

It is intended as a starting point of design, planning and building relevant climate related information useful for policy making processes. This process will subdue two further revisions during the next 2 years.

With this deliverable, the project has contributed to the achievement of the following objectives (DOA, PartB Table1.1):

No.	Objective	Yes
1	To co-design, co-develop, test, and assess the added value of proof-of-concept climate services for olive, grape, and durum wheat	X
2	To refine, validate, and upscale the three pilot services with the wider European and global user communities for olive, grape, and durum wheat	
3	To ensure replicability of MED-GOLD climate services in other crops/climates (e.g., coffee) and to establish links to policy making globally	X
4	To implement a comprehensive communication and commercialization plan for MED-GOLD climate services to enhance market uptake	X
5	To build better informed and connected end-user communities for the global olive oil, wine, and pasta food systems and related policy making	X

1. INTRODUCTION

The science-based knowledge relevant for climate related Policies brings together global scientific knowledge and local evidence to improve salience, relevance and legitimacy of policy dialogues and deliberations everywhere an action should be taken in the agriculture sector coping with climate change. This is the case of MED-GOLD project where there is a complex process of turning climate – related information into value for the three traditional Mediterranean food systems. This document that will be further expanded and revised by the end of the third and fourth year of the MED-GOLD project. The present initial step it is based on the preliminary elements identified among MED-GOLD activities and it works as an initial designing structure for the future planned activities.

1.1. PURPOSE

In recent decades, a large amount robust scientific knowledge has been produced that provides important information that can be used to make science-based decisions. However, additional decision- support tools and an understanding of the cognitive processes associated with perceptions of climate change are needed to use this information to transform society to be resilient to climate change. Science-based knowledge is then a main driver of the transformation process (RD.1). Furthermore only 2-way continuous communication processes between scientists and policy makers are able to foster such transforming dynamics by proving to policy makers the scientific foundation they really need (RD.2). As noted by some authors: increasing the usage of scientific evidence in policy-making requires that scientists increase their understanding and engagement with these policy organizations and individuals (RD.3). Furthermore this complex relationship between policy-makers and scientists should be developed and accurately maintained since an observed common feature in the policy change dynamics is its intermittent behaviour with long periods of stability, with little progresses, interspersed with periods of rapid growth of innovation; such behaviour is often referred as “punctuated equilibrium” (RD.4).

1.2. SCOPE

Since the MED-GOLD project aims to turning climate-related information into value added through a robust and progressive 2-way interaction between science knowledge and food system stakeholders, it is able to identify and highlight relevant science perspectives for policy makers. Thus, in principle MED-GOLD is suitable to help them to design effective interventions, to support economic growth and agronomic practice shifts, their vulnerabilities in the framework of climate change impacts.

1.3. DEFINITIONS AND ACRONYMS

1.3.1. DEFINITIONS

Concepts and terms used in this document and needing a definition are included in the following table:

Table 1-1 Definitions

Concept / Term	Definition
Vulnerability	Vulnerability has been defined as the propensity or predisposition of an individual, a community, assets or systems to be adversely affected by the impacts of hazards. It includes a variety of concepts and elements such as sensitivity or susceptibility to harm, and lack of capacity to cope and adapt. Vulnerability is a result of diverse historical, social, economic, political, cultural, institutional, natural resource, and environmental conditions and processes (EEA, 2017). In this report, vulnerability was examined in relation to how impacts of climate change can affect the olive, grape, and durum wheat sectors’ activities and associated critical decisions at micro level in particular, and, to some extent, at macro level (context of economic and market conditions)
Climate change impact	The term “impact” is used primarily to refer to the effects of extreme weather- and climate-related events, i.e. effects caused by the interaction of climate change or hazardous climate events occurring within a specific time period, and the vulnerability of an exposed society or system.



Concept / Term	Definition
Climate service	Timely production and delivery (translation and transfer) in customized products (projections, forecasts, information, trends, economic analysis, assessments, etc.) of useful climate-related data, information and knowledge that support adaptation, mitigation and disaster risk management to decision makers

1.3.2. ACRONYMS

Acronyms used in this document and needing a definition are included in the following table:

Table 1-2 Acronyms

Acronym	Definition
MED-GOLD	The project entitle "Turning climate-related information into added value for traditional MEDiterranean Grape, OLive and Durum wheat food systems"



2. REFERENCES

2.1. REFERENCE DOCUMENTS

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.x]:

Table 2-1 Reference Documents

Ref.	Title	Code	Version	Date
[RD.1]	Pasqui, M., & Di Giuseppe, E. Climate change, future warming, and adaptation in Europe. <i>Animal Frontiers</i> , 9(1), 6-11.			2019
[RD.2]	Brown, M. E., Escobar, V. M., & Lovell, H. Communicating the needs of climate change policy makers to scientists. <i>Human and Social Dimensions of Climate Change</i> , 49			2012
[RD.3]	Jones, N., & Walsh, C. Policy briefs as a communication tool for development research. Overseas Development Institute			2008
[RD.4]	Deliverable 4.1 Report on the identified specific needs and opportunities		4.0	29/11/2018
[RD.5]	D1.4 Mapping uncertainty and skill in seasonal forecasts and climate data		1.3	30/04/2019

3. PERFORMED ACTIVITIES

3.1. THE WORKSHOPS ACTIVITIES: EMERGING POLICY NEEDS

During this first phase of MED-GOLD project a series of workshops have been planned and unrolled within specific sectorial working groups and work packages (deliverable D4.1 - Report on the identified specific needs and opportunities). The main objectives for these face-to-face activities were to highlight user and stakeholder needs of climate services and related information relevant for helping the decision making processes and coping with climate change issues. In other words, to support the process of continuous transformation that agriculture must put in place constantly to achieve sustainable and profitable goals. These workshops were mainly oriented for project champions, their related end users and a broader community of stakeholders acting on the pilot areas in Italy, Spain and Portugal. Among them we had the possibility to preliminary intercept the “voices” and “needs” of specific policy makers attending the meeting.

In particular in the durum wheat sector several workshops were relevant for appraising needs through participatory meetings that are one of the most effective methods for gaining knowledge, where the attendees are the principal actors (RD.4). In the following part of the paragraph a brief summary of those specific deliverables is reported for convenience.

The first relevant meeting was the workshops held on the 15th and 16th May 2018 at the Horta S.r.l. premises in Ravenna addressed to Institution representatives. In that workshop 11 people participated, representing local political institutions, breeding companies, academic world and stocks exchange markets. The aim of this first workshop was to ascertain the key operational and strategic decision-making processes that could potentially benefit from the use of seasonal climate forecasts and long-term climate change projections. The aim and scope of the workshop were presented to the participants, so to make them aware of the Project activities and to illustrate the expected contribution. All the interactions with participants were carried out following guidelines developed in Task 1.2 (D1.6). The workshop was carried out as a free discussion, facilitated by a questionnaire prepared by HORTA partner. Participants were asked to think and discuss on if and how the availability of climate information would benefit their activity; on the aspects of the durum wheat management and food chain that would likely be affected by the availability of long term weather forecasts/ climate projection; on the most interesting time scale for this kind of information.

Workshop's participant showed an overall interest for weather forecast, mainly to allow intervention in the field for crop protection, and sub-seasonal (up to 3 months) climate predictions, useful to plan crop fertilisation, i.e. to save fertilizer in case on sub-optimal weather conditions, also to limit crop sensitivity to climatic stress and environmental pressure (nitrogen leaching).

Climate information for the next 2-5 years, which can be derived from decadal climate predictions, were considered useful for planning the supply chain contracts.

Climate projections were considered useful for breeding/genetic improvement activities, policy development, monitoring new pathogens, pests and weeds, as well as monitoring and prevention of the introduction and spreading of invasive alien species.

The useful weather information is considered to be the variation of the range and the volatility of weather parameters, such as temperature and precipitation. Information on extreme weather phenomena, such as heat waves and drought would also be appreciated. Climatic projections can give indications on future cultivation areas of the world, including marginal areas, so to inform on production estimation for market and food security.

Sectors that would most benefit from climate information are considered to be genetic improvement which would benefit most from climate projections, and plant protection, which would benefit from both seasonal forecast (for field agro-management) and from climate projections (e.g. emerging risks of new pest and diseases as well as changes in the most incurring ones).

Legislation, Policy and European Common Agriculture Policy are also considered important sectors where climate projections could play a key role, for instance by allowing the development of tailored interventions on land and water resources as well as defining regional incentives on specific sectors/cultivations. Plant nutrition (especially regarding N) is another sector that could benefit from weather and climate predictions, e.g. allowing correct fertilisation planning. The food industry is influenced in terms of quantity and quality of productions and, therefore, in the definition of market prices. Mechanisation is recorded to be somehow another component that could benefit from climate predictions and projections in terms of development/use of best suited machinery and investments according to future soil humidity.

The other sectorial workshops on wine and olive oil didn't highlight a significative presence of policy makers since were focused mainly on identifying user needs for private companies. During 2019 a series of interactions with the policy community has started with more than 10 documented interactions. In the future workshops it is planned to expand these interactions and prioritize invitations to policy makers at regional level to present MED-GOLD activities and products so that we can investigate such aspects through a fruitful dialogue.



During the MED-GOLD General Assembly 2019, the first half day was devoted to a local workshop titled "[MED-GOLD stakeholder workshop on Adapting Mediterranean agriculture to climate change](#)" in Cagliari (Sardinia island, Italy).

The workshop, officially supported by the Department of Agriculture of the Sardinia Region and the Association of Agricultural Engineers, was attended by representatives from the farmers' community, agri-cooperatives, farm advisers, agricultural consulting firms, private companies, researchers and students, the media and the policy community, including the Sardinia regional government. First, an overview was provided by the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) on the expected changes in grape, olive and durum wheat yields for the next years. This was followed by a short description of the climate services the project is developing for each of the crops, given by ENEA, Sogrape Vinhos and Horta partners. Then, BeeToBit informed on the evolution of the ICT platform that the project is developing to help generate climate services. At the end, there was an interactive session where participants discussed on the prospective development of climate services for Sardinian agriculture, including new proposals for adapting agricultural decisions in Sardinia to climate change.

The content of local workshop (in Italian) was:

- 1) [MED-GOLD: Il futuro dei servizi climatici per l'agricoltura Mediterranea](#) (Luigi Ponti, ENEA)
- 2) [Quali informazioni climatiche per l'agricoltura Mediterranea?](#) (Sandro Calmanti, ENEA)
- 3) [Il servizio climatico per il settore olivicolo oleario](#) (Luigi Ponti, ENEA)
- 4) [Il servizio climatico per il settore vitivinicolo](#) (António Graça, Sogrape Vinhos)
- 5) [Il servizio climatico per il settore grano duro e pasta](#) (Tiziano Bettati, Horta)
- 6) [Implementazione della piattaforma ICT per il servizio climatico](#) (Federico Caboni, BeeToBit)

During the GA 2019 another significant contribution on what are relevant topics for the policy – scientists dialogue, was proposed by Dr Ignacio Sanchez Recarte, the Secretary General of Comité Européen des Entreprises Vins (CEEV), titled: "*Dissemination toward the policy community for efficient implementation of research results*" identified a number of suggestions were posed as priorities to focus on in the next 2/3 years as mid-term priorities in the wine sector: adaptation to climate change ([resilience](#)); plant protection ([sustainability](#)); grapevine genetic resources ([knowledge](#)); consumption ([big data](#)).

3.2. WHAT WE PLANNED TO ACT: A POLICY BRIEFS SERIES

During a recent scoping meeting, in ENEA Headquarters (in Rome, Italy) on 20th Nov 2019, on the climate change future scenario we design a plan to establish a tailored link between scientific activities developed in MED-GOLD and policy makers already present in the stakeholder community and beyond. In particular this plan is made both of involving policy makers during the next series of sectorial scoping meeting and workshops on MED-GOLD pilot climate services, and the production of a policy brief series, for specific findings/topics in each sector within a local/regional framework. It will be also considered possible version of policy brief representative for the European scale identifying those implications which are relevant on a larger geographical scale, e.g. at European level, and covering a wider spectrum of potential interests.

We decided to adopt the science for policy brief scheme for reporting, proposed by Joint Research Centre that it could be summarize as follows: a main brief title, a headline section, an introduction paragraph to set the specific "scene" analysed by the brief itself, along with implications for the society; a paragraph describing the main scientific findings included those that have been identified by the project consortium; a conclusion section with policy option. A more extensive scheme is reported below with a checklist style questions to clarify the purpose.

Main title of the brief [max 1 line]

Headlines box (bullet points list style)

Setting the scene (a non-exhaustive/suggested list of questions follows)

What's the (political not technical) problem at stake?

Who's affected/interested? MS? International partners? Industry? Children? The elderly?

Women? Men? How many? Where?

Implications? Eg. Human lives, financially, climate....

Why a problem for Europe/World?

If relevant, international/national/regional policy & legislation

Any gaps, disagreement, controversy?

Current MED-GOLD dialogue with policymakers on this topic

Anything else of relevance you can think of!

Main scientific findings, incl. MED-GOLD work (a suggested list of questions follows)

Summarize state-of-the-art of science on this topic, in balanced and independent manner.

(How's the MED-GOLD helping? Be clear about MED-GOLD's added value!)





*Outline weaknesses (limitations, uncertainty, challenges to prevailing view, strength of evidence, consensus, lack of independence etc.)
What research is still needed in future?*

Conclusions/Policy Options

*Which policy options now can be proposed?
If you can, quantify benefits and costs.
Would it solve the problem? Part of it? Cause new ?
How might interested parties be react? (sensitivities)
Possibly, a recommendation.
Potentially new best practice/standard to consider?
Need to communicate this more widely? By whom?*

Furthermore, we plan a specific analysis activity on climatic past and future trends of bioclimatic indices change. The reference past climate period has been identified as the 1950-2020 and indices were computed with available gridded dataset, while the reference future period has been identified as 2005-2070 with indices computed with the [Bias-Adjusted regional climate models data of the Euro-CORDEX initiative](#). This further step enlarge the climate analysis already performed in the WP1 and summarized in the RD.5 report.

Finally, the MED-GOLD project is close to the climate service prototype preliminary implementation, thus in a fruitful and strategic condition to involve directly the policy makers community into the evaluation of the produced information together with users and other stakeholders.



4. CONCLUSION

- The Durum wheat sector face to face workshops highlighted a relevant information about policy makers' needs. This was an initial point to start the process of drawing up science based information that could help policy makers to help them design effective interventions, support economic growth and agronomic practice shifts in the face of climate change. The other sectors already started a series of contacts with policy makers to inform and interact with them, process that will be reinforced in the next period along with a specific action of inviting them during the next planned workshops.
- Climate information for the next 2-5 years, which can be derived from decadal climate predictions, were considered useful for planning the supply chain contracts. Along with climate projections which were considered useful for breeding/genetic improvement activities, policy development, monitoring new pathogens, pests and weeds, as well as monitoring and prevention of the introduction and spreading of invasive alien species. Information on extreme weather phenomena, such as heat waves and drought would also be appreciated. Climatic projections can give indications on future cultivation areas of the world, including marginal areas, so to inform on production estimation for market and food security.
- Sectors that would most benefit from climate information are considered to be genetic improvement which would benefit most from climate projections, and plant protection, which would benefit from both seasonal forecast (for field agro-management) and from climate projections (e.g. emerging risks of new pest and diseases as well as changes in the most incurring ones).
- On the above mentioned key points, it is planned:
 - to increase policy makers involvement in the next future workshops in all the sectors;
 - to start a producing phase of policy briefs series for specific topics, for each pilot areas, with a possible upscale process for those topics which are relevant at European level.
 - to start a bioclimatic indices trend analysis for highlighting recent changes and future expected changes on the agricultural sectors analysed in MED-GOLD.



END OF DOCUMENT

